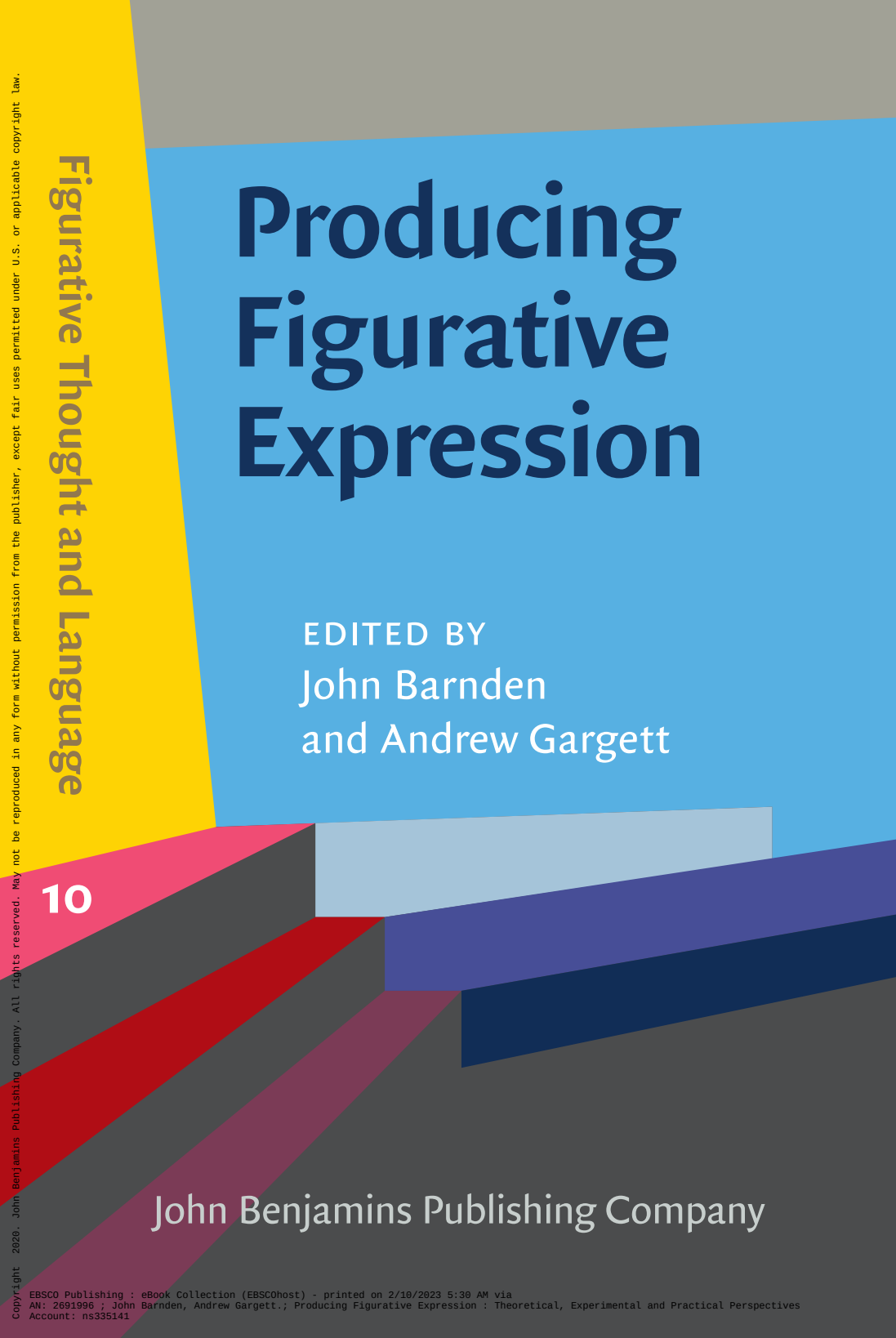


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Producing Figurative Expression

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Volume 10

Producing Figurative Expression
Theoretical, experimental and practical perspectives
Edited by John Barnden and Andrew Gargett

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Producing Figurative Expression

Theoretical, experimental and practical perspectives

Edited by

John Barnden
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Preface

Figurative expressions are a key feature of human interaction, where such interaction typically involves combinations of **both** understanding **and** production of such expressions. But, when the current volume's editors first started to discuss the topic of metaphor generation, it soon became a matter of some concern that work on the production of figurative expressions has been relatively scarce, compared with the much greater wealth of work on their understanding. Further discussion with colleagues across a surprisingly wide array of disciplines, led to us becoming aware of a critical mass of scholars who thought the same way, and who would be willing to come together to discuss this in a more formal setting.

This volume had its origins in one such event, at a Theme Session we organised on "Producing Figurative Language: linguistic, cultural, philosophical, psychological and computational perspectives", as part of the 13th *International Cognitive Linguistics Conference* (ICLC-13), from 20—25 July, 2015 at Northumbria University, Newcastle, England. We are most grateful to the organisers of this conference for facilitating our session, which led to many wide-ranging and interesting discussions. We are also extremely grateful to the generous efforts of leading researchers who presented their work at the session. The volume contains articles developed from that work, but also contains articles by additional authors whom we later invited to contribute.

The Theme Session was initially suggested by one of us (Gargett) as an offshoot from work of his that was supported by a Marie Curie International Incoming Fellowship on the *Gen-Meta* project (2013—2015, FP7-PEOPLE-2012-IIF, ID: 330569). *Gen-Meta*, very generously supported by the EU's FP7 framework, focused on combining techniques from symbolic and statistical AI to model metaphors from natural language, and enabled a range of activities in the general area of AI and figurative language, laying the ground for the current volume. In particular, this project provided an invaluable opportunity for Gargett to learn from and collaborate with John Barnden, the other editor of this volume, who has long been intensively involved in AI and other approaches to figurative language.

We are also very much indebted to Angeliki Athanasiadou and Herb Colston, Series Editors for the *Figurative Thought and Language* series being published by John Benjamins. They initially raised the idea of producing a volume for the series, and their subsequent support has been a primary enabler for the eventual delivery of the volume. We also received important feedback for improving the volume from anonymous external reviewers. Perhaps most importantly, however, we would like to thank all our creative, exceptional, and impressively patient authors,

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without whom this volume would certainly not be. Their tireless dedication to various tasks we requested they undertake, and their capacity to do all of this with such enduring enthusiasm, has been an inspiration for us.

Collectively, we have been driven by an urgent need to fill a glaring gap in current scholarship in figurative communication, and we sincerely hope this volume indeed makes such a contribution.

Last, but by no means least, we would like to thank the wonderful team at John Benjamins for their help and support in the final stages of delivery of this volume, particularly in such trying times under the ever darkening cloud of a global pandemic.

Andrew Gargett
John Barnden
August, 2020

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Introduction

John Barnden & Andrew Gargett
University of Birmingham / Open University

1. Motivation for the volume

This volume contains a selection of recent work on the production of figurative language and other forms of figurative expression. This is with the intent of helping to set right an imbalance in the amount of work there has been on production as compared to the larger amount on the understanding of figurative expression. The terms "production", "figurative" and "expression" here all need some comment. By "figurative" we mean involving the use of a device such as metaphor, metonymy, irony, hyperbole, or understatement. A large majority of the chapters in this volume focus on metaphor, but a substantial minority focus on irony and sarcasm. Hyperbole is solidly represented, being a central topic of two chapters and featured in two others. One chapter takes a broad view across many figures, however. The individual chapters are summarized in the next section of this Introduction.

Devices such as metaphor do not occur merely in language. We use "expression" to allow for non-linguistic items such as hand gestures, pictures, diagrams, consumer artefacts, musical pieces, dances, and so forth. Within this range of non-linguistic possibilities, the chapters in our volume only in fact address the visual/spatial modes such as pictures and consumer artefacts. Nevertheless, we would hope that some of the considerations carry over to other modes such as gestures and music.[1]

In broadening from language to other forms of expression, we are influenced by the view, held by many modern scholars of phenomena such as metaphor, especially in the field of Cognitive Linguistics (see, e.g., Geeraerts & Cuyckens 2007), that the phenomena to be addressed are fundamentally mental/emotional/

1. So for us a figurative painting, sculpture, musical piece or other artwork would be one that was (say) metaphorical. There is a clash here with the use of "figurative" as applied to an artwork to mean that it more or less realistically depicts something such as a person or a landscape, and does so for the sake of sincerely showing that item, not using the item as (say) a metaphor for something else. This notion of figurativeness is, unfortunately, diametrically opposite to the one used in our area.

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body-internal ones, with the external manifestations in language, pictures, etc. being derivative from the internal phenomena.[2] So, for instance, talking of one person being *"above"* someone else in a power structure happens ultimately because it is convenient for us to think or conceive of power relationships in terms of relative vertical position in physical space; and this way of thinking or conceiving can also be manifested in a picture, diagram, hand gesture, facial expression, dance, etc. (See, e.g., Cienki & Müller 2008, Corts & Pollio 1999, Forceville 1994, 2006, Forceville & Urios-Aparisi 2009, Kappelhoff & Müller 2011, Kennedy et al. 1993 and McNeill 1992, 2005 for work on figurativeness, notably metaphoricity, in visual media and gestures.)

By "production" of expression we mean the creation of figurative utterances (spoken, written or signed), gestures, paintings, pieces of music, and so forth. We include also the creation of *thoughts* or other cognitive/emotional items that are couched metaphorically or otherwise figuratively in one's brain, even if not externalized in communication. And even when externalized, this may not primarily be for the sake of communication to others on a given occasion. One may, for instance, make a certain facial expression or bodily gesture as part of experiencing an emotion, even when one is in private.

As a final comment on what we assume about production, we do not assume across the board that the producer is conscious of including figurative devices, though it would be natural to assume there is such consciousness in some type of production, especially the considered and time-consuming crafting of artworks and artefact designs. (See Hidalgo-Downing & Kraljevic Mujic 2020 on metaphorical creativity in discourse, artworks, etc.)

The volume is multidisciplinary, with an emphasis on linguistics, psychology and artificial intelligence. This reflects our wish to promote the further study of figurative production across relevant disciplines. Given this dimension of breadth, combined with breadth across different figurative devices and breadth across different modes of expression, the volume cannot hope to be comprehensively representative of contemporary research on production. That ambition would have required multiple volumes on the same scale, or a very fat handbook indeed. In various senses there has been a large amount of work on production of figurative expression (mainly in language). This is so not just within artistic areas such as creative writing

2. This does not mean to say that understanding the utterances, etc. produced by others cannot in turn create new or modified long-term mental representations, procedures, etc. in oneself, which then affect one's own productions. It's a two-way street, or better a tangle of two-way streets. The question is whether metaphor, etc. fundamentally arises from the nature of the minds joined by the streets, from the nature of the streets, or from both.

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and painting, where the careful crafting of figurative elements is central. Looking outside those areas, we have for instance the great attention that translators even of mundane language must pay to figurative devices in order to produce natural-sounding utterances in the target language. As a second example, a standard type of work in the study of metaphorical language is to examine the patterns of metaphor usage in large bodies of recorded language, partly to see how it is influenced by such factors as genre (scientific writing, news reporting, general conversation, etc.), the political bias of the speakers or sources, or the historical period in which it lies.

A further consideration is that much work on language within philosophy and language pragmatics (notably as centred on the work of Grice, speech-act theory, and Relevance Theory: see, e.g., Sperber & Wilson 1995, Ward & Horn 2004) brings in questions of what meaning the speaker is trying to convey, what she is trying to avoid saying explicitly – or can afford not to bother to say explicitly – what speech act such as stating, requesting or commanding she seeks to perform, and so forth.[3] Such research is in that sense about production even when the main focus of the work is to develop a theory stipulating the meanings that given utterances have or a theory accounting for how hearers uncover/construct meanings of utterances they receive.

There has also been much discussion of the broad purposes of metaphor, irony, etc., such as economy of expression, meaning enrichment, vividness, emphasis, de-emphasis, catalysing of conversation, objectivity enhancement, extolment, persuasion, misdirection, implicit communication and elicitation of emotions and evaluations, (im)politeness, ingratiation, self-protection, identification-as, in-group maintenance, mastery demonstration, tension reduction, teasing, and humour (see Colston 2015 for an extended and wide-ranging treatment, and also Gibbs 2000, Gibbs et al. 2002, Katz 1996, Popa-Wyatt, this volume, Roberts & Kreuz 1994, Steen 2008). Such purposes are a central issue in figurative expression production. There has also been work in psycholinguistics studying what precise forms of figurative expression people prefer to use in different circumstances. One main focus here has been on whether people prefer to use a metaphor of form A is B versus a corresponding simile of form A is like B depending on context and what A and B are (see, e.g., Chiappe & Kennedy 2001).

As a final illustration of work on figurative production, there is a large and growing body of research on "bidirectionality" or the apparent tendency of people to move mentally from metaphor targets to sources (as well as from sources

3. Throughout the rest of this introduction we will stick to the common practice of using "speaker" metonymically to mean "speaker or writer or other producer" and correspondingly "hearer" to mean "hearer or reader or other recipient."

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to targets). An example is that of experiencing increased bodily warmth when hearing about affection (cf. the commonly used metaphorical view of affection as warmth) or in feeling a USB stick to be physically heavier when it contains more important information (cf. the familiar metaphorical view of importance as weight) – see, for example, Chan, Tong, Tan & Koh (2013), Denke, Rotte, Heinze & Schaefer (2016), Dong, Huang & Zhong (2015), He, Chen & Li (2018), He, Chen, Zhang & Li (2015), Landau, Meier & Keefer (2010), Lee & Schwarz (2012), and Schneider, Parzuchowski, Wojciszke, Schwarz & Koole (2015). The mental operations involved could be said to be a form of internal production of metaphorical expression. An example would be someone's internal production of the thought that one USB stick is heavier than another when she is told that the former contains more important information than the latter. However, in most cases the research appears to have focussed not on the production of such focussed, articulated thoughts but instead merely on the stimulation or facilitation of sensations (warmth, smells, etc.) and the activation of brain regions that may be related to such sensations or similarly to motor actions relevant to the source domains at hand. Indeed, not all the studies clearly support internal production of metaphorical expression, as opposed to mere stimulation of relevant source items. For instance, a study by Lee and Schwarz (2012) suggested an internal step from suspicion to fishy smell, relating to the metaphorical use of "*being/smelling fishy*" to mean being worthy of suspicion. But what was demonstrated was merely participants' heightened sensitivity to a fishy smell in, say, a test tube when they were led to think that the experimenter was acting suspiciously. It was not that the experimenters or their activities themselves smelled fishy to the participants!

Now, despite all the work impinging on production, including extensive treatments such as that of Colston (2015), it is fair to say that, looking at the research landscape as a whole, research on what the speaker or other producer is thinking or doing in the production of figurative expression has been considerably less extensive than the amount of research on what the hearer or other receiver is thinking or doing in understanding figurative expression. To give flesh to this impression of relative imbalance in the attention given to production and understanding, we can make some specific illustrative observations.

First, much contemporary metaphor theory and investigation is based on the notion of *mappings* between the source subject matter and the target subject matter of a linguistic utterance (Lakoff & Johnson 2003). For example, in the metaphorical sentence "*There is a roaring torrent of ill-gotten money flowing through Western banks*" the target subject matter is money and transfers of it, and the source subject matter is (arguably) water and its movements through a landscape. One can theorize that there is a mapping from water to money, from moving masses of water to processes of money-transference, from locations or receptacles

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where water can lie to money-handling institutions such as banks, and so forth. It would generally be supposed that we know such mappings as part of our general experience with English and life. On the other hand, in suitable circumstances we can invent them in the course of understanding a sentence. There are prominent accounts of such invention during understanding (notably in Bowdle & Gentner 2005) and we can presumably in principle invent them during production as well. But for simplicity here, we will assume that the speaker and hearer of our money/torrent example are already familiar with the mappings before producing or encountering the sentence. Now, what has been most discussed in cases such as this is the hearer's side of the matter – how a meaning concerning money transfer arises for the hearer from the sentence through use of the mappings to "translate" the source-side scenario about water movement that is literally described by the sentence to a target-side scenario about money transfer. What is much less commonly discussed is exactly how, why and when a speaker would start with a scenario about money transfer and use the mappings in the target-to-source direction to construct a source-side scenario that fits it – as opposed to not using any metaphorical mappings, or to use some alternative ones that might be available, for a view of money as something other than water; or what leads the speaker to use a particular water-noun such as *"torrent"* versus another such as *"river,"* or to include a particular qualifier such as *"roaring"*. It mainly just seems to be tacitly assumed that speakers successfully do such things in a reasonably principled way.

Equally, under the class-inclusion or categorization theory of metaphor (Glucksberg 2001), by far the strongest focus is on understanding. When faced with, for instance, the classic example of *"My job is a jail,"* the hearer is theorized to find a category *jail** that includes both real jails and jobs, postulates that the speaker's job is in *jail**, and therefore derives particular properties of that job. But it is much less discussed how the speaker goes from some particular thing she wants to convey about the job and then chooses an appropriate source-side category such as jails – as opposed to just expressing the point literally or using some other different source category – or how a speaker might creatively come to utter some variant such as *"My job is a high-security prison with lots of isolation cells."*

Another illustration of the production/understanding imbalance can be found in a branch of irony research. This branch attends to ironicity markers or signals (Kreuz & Roberts 1995, Pexman 2008; additional references in Burgers & Steen 2017) such as sarcastic intonation, special lexis used (e.g., the common use of *"Sure"* or *"Great"* as an interjection starting an ironic statement), and hyperbole (e.g., use of *"a genius"* rather than just *"a clever person"* in ironically saying *"Sure, Mike's a genius"* when in fact it has only been claimed that Mike is clever). But the focus is strongly on how such clues are to be used by a hearer to help decide whether an utterance is ironic, rather than on speaker processes leading to

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their inclusion or otherwise (but see Kreuz & Johnson, this volume, on this matter). This is despite the fact that the prominent theoretical approaches to ironic communication – the pretence and echo-based approaches (Clark & Gerrig 1984, Currie 2006, Kumon-Nakamura, Glucksberg & Brown 1995, Popa-Wyatt 2014, Wilson 2006, Wilson & Sperber 2012) – are, ironically enough, at least ostensibly about what the speaker is doing: pretending or echoing, in certain senses.

Again, in AI, work on figurative language has focussed mainly on understanding – of metaphor, primarily, with metonymy in a decent second place, and with increasing attention to irony – although there have long been efforts also on metaphor generation. Metaphor generation is a strong interest in the "computational creativity" community (see particularly Veale, this volume), whereas recent computational linguistic work on metaphor has largely been on detecting, categorizing and roughly paraphrasing metaphorical utterances rather than on producing them. A relatively representative corpus exhibiting this tendency can be collected from the series of workshops held at the North American chapter of the Association for Computational Linguistics (NAACL) since 2013. Of the fifty or so papers at the five meetings that have been held so far (in 2013, 2014, 2015, 2016, 2018), only the following submissions focused on production (the last 2 were not strictly on computational processing of metaphor): Veale (2014), Veale (2015), Veale (2016), Gero and Chilton (2018) and Skalicky and Crossley (2018).

However, a notable early system for metaphor processing (MIDAS: Martin 1990) did both production and understanding; it sought to answer metaphorically couched questions about the Unix operating system (questions such as *"How do I kill Emacs?"*, Emacs being a document editing program) and sought to couch replies in terms of the same metaphorical views as the questions.

These illustrations of a production/understanding imbalance are just some among many that one might give. The motivation of our volume is to help stimulate the redressing of the imbalance by presenting a range of illustrative, recent work on the production side. Some of the contributions delve explicitly into production processes, while others serve more to draw attention to forms of figurative expression that raise pressing issues that need to be addressed by detailed accounts of production processes.

This motivation is an ambitious one in the sense that the imbalance is not just accidental or a result of vagaries of academic history, fashion or prejudice. Rather, it has arisen from genuine research obstacles. For instance, while with sufficient care one can get experimental participants in a psychological study to undertake, in a reasonably natural way, the understanding of figurative utterances or other forms of expression by presenting them with such items, it is much less clear how to get participants naturally to produce figurative items. One could tell the participants to produce them, but the conscious deliberation involved might

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lead to processing that is greatly different from that which would normally arise in ordinary discourse; and the study would be hostage to participants having an understanding of the type of figurativeness of interest (metaphor, irony, etc.) that is close enough to the experimenter's. Also, the problem is amplified if one wants the participants to produce items of a controlled sort, for instance with a particular syntax or using a particular source subject matter for a metaphor. (Two of the chapters in the volume – by Colston and by Katz – explicitly seek to circumvent these methodological problems.)

Somewhat similarly, in AI, one can seek to devise a system that can understand, or can learn to understand, figurative utterances, pictures, etc. when the system happens to encounter them. But, difficult though devising such a system is, there are even more difficulties in devising a system that produces or learns to produce figurative items, as then one meets such questions as why and when to produce them, what familiar metaphorical conceits to choose from a range of available ones, and so forth. Parallel questions do not arise on the understanding side, where the system is stuck with understanding the particular metaphors at the particular times they come along, the only leeway being in whether to ask for clarification, how deeply to understand, or indeed whether to bother to understand at all.[4]

As for linguistics, at least of the more theoretical or cognitive sorts, it is natural for there to be a focus predominantly on linguistic utterances as objects already produced and thus to give priority to investigating how they convey meaning to a reader/hearer – or even just to investigating what meaning they convey, without looking at the processes for either discerning or constructing that meaning, let alone processes for going from speaker/writer's meaning to linguistic utterance. Of course, linguists (and others) interested in certain topics such as language learning must attend to production processes.

This is not to say, of course, that study of already-produced expressions, where one has had no control over the production, does not illuminate production. Several of the chapters in this volume gain insight into production by looking at linguistic corpora, for instance. There are particular difficulties in using corpora in studying figurative language, because of the difficulty of comprehensively and systematically finding instances of the targeted type of language in a large corpus (see, for example, Colston 2015: Ch.5, where some work-arounds are also discussed).

4. Of course, human understanders also have such leeway. We should avoid the mistake of assuming that in all discourses a hearer needs to derive a deep, or indeed any, understanding of a particular utterance by a speaker – it all depends on how interesting or useful the hearer thinks the speaker's pronouncements may be!

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2. The chapters

Here we summarize the content of each chapter. We have emboldened words such as "metaphor" and "irony" in each summary to enable the reader to see quickly which chapters deal with which types of figurative expression, with chapters themselves grouped on other grounds, as follows.

The first and second groups are for chapters whose main focus is to present, survey or provide methodologies for empirical studies whose ultimate aim is to illuminate cognitive processes of production. The empirical methods are various but include psychological laboratory experimentation and linguistic corpus analysis. The first of the two groups gathers studies whose main focus is production of metaphor, but note carefully that other types of figuration may play an important role as well. The second group is for chapters with a joint, broader or otherwise different focus; for example, they are focussed on a combination of metaphor and another figure, or on hyperbole or irony, or on figurative language without making metaphorical aspects explicit.

The third group is for empirical work or theoretical analysis that is aimed mainly at exploring the role of figurative production in some specific application area. The areas addressed are product design, discussion of psychological harm, and language learning.

The fourth and final group is both for theoretical analysis with no specific application area in mind and for cognitive or computational modelling of figurative production.

Necessarily, the boundaries between groups are fuzzy: a chapter in a particular group can contain work of another group's type as well. And readers with specific interests may well focus on a set of chapters that cut across our categorization. For instance, one important theme is metaphor outside language. This features mainly in the chapters by Cila & Hekkert, Kennedy, and Ojha & Indurkhya. Computational modelling of production appears in Ojha & Indurkhya as well as in the fourth group.

2.1 Section 1: General empirical studies, with main focus on metaphor

Albert Katz surveys a string of studies he has conducted that involve figurative-language production, both for the purpose of studying production itself and for generating material for use in comprehension studies. A guiding principle has been (as in the Colston chapter, see below) a desire for a good balance between ecological validity and experimental control, by using suitably designed laboratory techniques. The studies support Katz's contention that production procedures in laboratory experiments can provide novel insights that have not emerged from

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nonexperimental approaches or from reception-based experiments (where participants are just confronted with already produced linguistic stimuli). The studies surveyed are too numerous and varied to summarize here, but, as one example, in a recently started programme of work he has been studying people's preferences as regards the semantic spaces used in the **metaphors** they produce. They have explored whether producers are affected not only by the semantic distance between the concepts brought together in the metaphor, but also by the "density" of the spaces. A given concept used in a metaphor, such as the source concept *balloon* in *"Joy is a balloon,"* might be semantically close to relatively many or relatively few other concepts in the source space of physical objects. Findings indicate that people prefer to generate (and find it easiest to comprehend) metaphors with source concepts that come from "sparse" spaces. Somewhat earlier work mentioned in the chapter provides experimental evidence, from metaphor production tasks, that people do have knowledge of conceptual metaphors such as LIFE IS A JOURNEY, something that has been contentious and difficult to study experimentally. Other studies mentioned in the chapter look at such matters as what discourse ecology invites metaphor or sarcasm production, and how production is affected by the genders of the speaker and hearer. Some of the work involves gratitude acknowledgments, another point of resonance with Colston's chapter.

John Kennedy exemplifies and discusses the production by blind people, even when congenitally so, of drawings that are of real or potentially real objects (cars, lakes, …) but that contain **metaphorical** devices, such as lines to indicate wind or pain in a hand, and inventive distortions of the shape and position of car wheels to suggest motion, braking or stationariness. The devices are in general well understood by the sighted. Kennedy's work highlights the importance of considering tactile as well as visual experience as the basis for metaphorical devices in pictures, and the possibility that this is important for the sighted as well as the blind. This chapter therefore continues the general themes of the multimodality of metaphor and its primary residence being inside us rather than in our external expression, while also affirming that pictures are relevant to the blind as well as to the sighted. Kennedy ends with an important sociocultural point that major museums are beginning to take note of blind people's facility with pictures by, for instance, including raised-line versions of them.

Andreas Musolff theorizes that, and empirically studies how, **metaphor** production and interpretation are intricately connected as communicative acts. Interpretation can lead to new and possibly disruptive metaphor versions, and this can be construed as the involvement of a strong production element in metaphor interpretation. The empirical evidence that Musolff adduces is corpus data and (cross-linguistic) questionnaire-derived data about body-based metaphors in politics, notably the use of the human body as a source to describe a country

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geographically or abstractly. We see the interconnection of production and interpretation as a fundamental issue to be given more attention in future research, and we expand on this point in the last section of this Introduction.

Amitash Ojha and Bipin Indurkhya present a theoretical, experimental and nascent computational exploration of the role of perceptual similarity in producing visual **metaphors**. They analyse advertisements to argue that relatively superficial perceptual similarity is used in various kinds of visual metaphors appearing there (and presumably in visual metaphors in other genres of expression). Ojha and Indurkhya hypothesize that such perceptual similarity plays the important role of inviting the viewer to consider deeper metaphorical interpretation of an image. They report on two experiments indicating that perceptual similarity is intuitively recognized and that shape-based perceptual similarity is preferred in representing metaphors pictorially. Finally, Ojha and Indurkhya propose a computer program to generate visual metaphors based on conceptual similarity but aided by algorithmically-determined perceptual similarity.

2.2 Section 2: General empirical studies – other

Herb Colston provides us with two advances: (a) a theoretical and experimental study of production of a certain type of language that is often figurative, and (b) a methodology for getting experimental subjects to produce examples of language. This methodology is applied to the particular type of language in (a), but is of general applicability to production tasks (and not just linguistic ones, we might add). The language type in (a) is gratitude acknowledgments such as *"anytime"* or *"you're welcome"* that you might utter when someone thanks you. Colston uses these to exemplify a broader range of formulaic language that has received relatively little experimental study. The main type of figurativeness in gratitude acknowledgments is **hyperbole**, as in typical uses of *"no trouble at all"* and *"anytime"* (which is hyperbolic in that the speaker is not willing to provide the service literally at *any* time). The methodology in (b) is to present participants with carefully crafted, short written stories placing them in situations where they had recently granted a favour to someone who has now thanked them. Participants were asked to consider and write down what they would actually say in response to the thanking. Thus, the situations were carefully controlled, but the participants were allowed complete latitude in responding. This is a compromise between studying completely natural, found interchanges – where it would be difficult to find enough experimental control to isolate and study variables of interest – and a tighter experimental paradigm where participants are more constrained in what they can respond – in which case the experiment is prey to artificial interference with what participants

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would in fact normally do. Thus, the methodology is intended to provide an acceptable compromise between ecological validity and experimental control (as in the Katz chapter, see above).

Francesca Ervas considers persuasive uses of **irony** as a form of argumentation. She asks, given the risk of misunderstanding that irony naturally carries, why a speaker who wants to persuade someone of something would take this risk. The hypothesis of the chapter is that the ironist does not simply want to persuade, but wants to persuade in a particularly forceful way: the ironic argument has a specific emotional charge which cannot be found either in literal arguments or in other arguments containing "suggestive language". Ervas reports a pilot experimental study that lends support to the hypothesis, and also explores the difference between speakers' use of **sarcastic** irony and their use of non-sarcastic irony, and between their use of negative irony (irony that criticizes) and their use of positive irony (irony that praises). The study also shows speakers and hearers assigning different affective charges to the same ironic comment.[5]

Rachel Giora's chapter continues the exploration and confirmation of her Defaultness Hypothesis, which is (roughly) to the effect that words and constructions have default meanings/interpretations that come to mind quickly and unconditionally (e.g., regardless of contextual appropriateness). The Hypothesis leads to various predictions about the production and comprehension of utterances. The chapter's main focus here is a prediction about production, concerning resonance between close-by segments of a discourse: if a prior and/or upcoming utterance does resonate with a given utterance, it will resonate with the latter's default rather than nondefault interpretation, irrespective of that interpretation's degree of figurativeness, novelty or contextual fit. The chapter concentrates on resonance with **metaphorical** and **sarcastic** interpretations of sentences of a certain sort. These sentences involve a variety of negative constructions, such as in *"You are not my boss"* and *"He is not the sharpest pencil in the box."* It presents corpus studies that support the resonance prediction.

Loes Koering provides evidence for the idea that one tool speakers have for guiding hearers to a figurative interpretation of an utterance is definiteness marking. Experiments showed, in particular, that figurative expressions containing a pragmatically unlicensed definite article gave rise to highly **idiomatic** meanings, ones that, moreover, tended strongly to be non-transparent (i.e., difficult to relate to the literal meaning of the expression). The idea is that, when a hearer is presented

5. And it is not clear to us whether current theories of irony are equipped to cope with this affective divergence between speaker and hearer, partly because the theories do not have clearly separated, well-developed subtheories of production and comprehension.

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with, for instance, *"John needs to wash the pig"* in a context that isn't about pigs, he is both unable to find an existing pig as referent in the discourse and prevented by the definite from introducing a new one. As a result the hearer instead tends to map the pig-washing as an unanalysed unit onto a unique event relevant to the context, with little regard to any transparent correspondence of aspects of this event to a pig and its washing. By contrast, when an indefinite article is used (as in *"John needs to wash a pig"*), hearers have a somewhat greater tendency to construct transparent meanings. While the experiments in the chapter are directly about comprehension rather than production, one can assume that speakers have some sensitivity to how they themselves or a hearer would take an expression, so that in inventing a new figurative expression they can use definiteness to guide hearers to figurative understandings.

Roger Kreuz and Alexander Johnson provide a review and assessment of the current state of literature on factors (situational, pragmatic, cultural, …) that affect whether speakers use **irony**, on features that can help a hearer identify an utterance as ironic, and (consequently) features that speakers can confer on their utterances to try to make them detectable as ironic. The chapter covers computer-mediated communication (emails, Twitter posts, etc.) as well as more traditional forms of language. Amongst the issues discussed in the chapter are the amount of common ground between speaker and hearer that the speaker perceives as existing, discourse goals of the speaker, the genders of speaker and hearer, cultural differences, language differences, lexical cues such as interjections, **hyperbole**, facial and manual gestures, tone of voice, and speakers' personality and cognitive ability. In the case of computer-mediated communication, emoticons, emojis, special punctuation and hashtags are additionally discussed. Also, work on automated detection of irony is discussed, partly in the context of sentiment analysis (detection of emotions, evaluations, etc.). Here the potential importance of taking note of particular authors' histories of use of terms is noted. The chapter ends with a mention of unanswered questions such as how to distinguish **sarcasm** from non-sarcastic verbal irony, whether this is even a valid enterprise, and the nature of the relationship of irony to phenomena such as banter and teasing.

2.3 Section 3: Empirical and analytical studies aimed at specific applications

Nazlı Cila and Paul Hekkert discuss the generation of **metaphors** in product design. One of their examples of such a metaphor lies in the *"Excalibur"* toilet brush. This looks much like and is to be handled much as a sword – where the sword is further suggested by the name Excalibur (the famous, magical sword in the King Arthur legends). All this combines to encourage the idea that the brush

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superbly enables one to defeat the "enemies" that may lurk in a toilet. This example shows also the cooperation between linguistic and tactile metaphor, and nicely brings out the rich cross-modality of metaphor in even the most mundane areas of real life. Cila and Hekkert discuss various dimensions of the product-metaphor producer's task, provide a general framework for this activity, and offer metaphor producers some guidance on creating more effective and aesthetic metaphors.

Fiona MacArthur addresses speakers' production of **metaphor** in second languages (L2s) rather than in their own, first, languages (L1s). This matter has so far been examined very little in comparison with difficulties that people have in understanding L2 metaphor. Also, even the work on the production side has focussed on written at the expense of spoken language. The chapter is a start on filling these gaps and examines the metaphors used by L2 speakers of English in face-to-face interaction with L1 speakers (native speakers of English) or other L2 speakers. MacArthur considers the frequency of metaphor production, the general characteristics of metaphors produced, their conventionality, and some of the factors that prompt metaphor use. One finding was that inexact repetition of language forms may fossilize in L2 speech, giving rise to particular kinds of variation not found in L1 speaker discourse. On the other hand MacArthur also found indications that L2 speakers rarely relexicalize, explicate or challenge each other's metaphoric productions in the way that L1 speakers do.

Susan Nacey explores **metaphorical** analogies produced in computer-mediated discourse by survivors of relationship abuse in talking about their experience. Survivors often produce such metaphor in an effort to make something that's difficult to describe, or even to understand, clearer to others and/or themselves. The chapter's analysis also discusses the ways in which survivors negotiate metaphorical scenarios and frames among themselves, with the negotiation generally being in a positive spirit and resulting in flexible adaptation of the metaphors. (This adaptive process resonates with that in Musolff's chapter.) Examples of metaphors studied range from ones that are more familiar, such as metaphors where something bad is compared to a natural disaster, or emotional turmoil is compared to ocean waves, to ones that are more inventive, as when the gradually more encompassing nature of abuse is conceptualized as a frog in water that is slowly heated to boiling, or alternatively as a clock whose alarm starts off softly and gradually becomes shriller.

Sarah Turner, Jeannette Littlemore, Meera Burgess, Danielle Fuller, Karolina Kuberska and Sheelagh McGuinness provide an exploration of the ways in which **metaphors** are used by women who have suffered pregnancy loss (through miscarriage, termination or stillbirth) and by people who support them. Such metaphors can, to varying extents, help both the bereaved and the supporters make sense of and gain insight into the experiences. The chapter focusses on time-related meta-

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phors, including ones that focus on the development of feelings over time. It was found that time tends to be reified, enabling it to be viewed as a gift or resource or in more animated terms as a healer or as a cause of hindrance. Bereaved individuals appear to have developed a distinctive personal relationship with time. When they adopt a moving ego perspective on time – i.e., metaphorically viewing themselves as moving along a timeline towards events – they exhibit a marked lack of agency in the ways in which they describe the movements. For some individuals, their experiences appear to have taken them outside linear time, and they report experiences of occupying a space outside the world and its time line. The chapter ends by discussing the implications of the findings for caregivers, who must tread carefully – they need to respect the different conceptualizations of time used by the bereaved and to realize that conflict between competing conceptualizations should be minimized.

2.4 Section 4: Other theoretical analysis and cognitive or computational modelling

Francisco Ruiz de Mendoza Ibáñez regards metaphor, metonymy, irony, etc. as figures of thought and accordingly concentrates on the "cognitive operations" involved in production and interpretation, where the particular notion of cognitive operation he uses is one he has been developing in extensive previous work. He relates cognitive operations to basic figures of thought such as **metaphor**, **metonymy**, **understatement**, **overstatement**, **irony**, **paradox** and **oxymoron**. He then explores other figures of thought, traditionally studied in rhetoric and literary studies, as relatives of these more basic ones, thus connecting them indirectly to cognitive operations. These figures include further well-known ones such as **sarcasm**, **allegory** and **litotes**, but also ones with labels that are likely to be new to many readers, such as **anthimeria**, **anthonomasia** and **auxesis**. He makes advances on the question of constraints on figuration by applying his Extended Invariance Principle and the Correlation Principle more widely than before, and by putting forward a maximization principle as a constraint based on extreme resemblance (echoing) and/or contrast.

Stephen McGregor, Matthew Purver and Geraint Wiggins present a novel, computational, statistics-based model of **metaphor** that, while not initially developed with production in mind, shows considerable promise for production. The model is founded on projections of representations to each other, where the representations are mathematical vectors derived through complex statistical analyses of large-scale linguistic corpora or subcorpora. These projections involve defining context-specific subspaces of co-occurrence statistics in which metaphors can be modelled as mappings between congruent regions of semantic representations.

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The authors also offer this methodology as an empirical implementation pointing towards a resolution of theoretical stances that can seem to be in tension with each other: one, as in cognitive linguistics, focussed on construing metaphor as a result of underlying cognitive processes; the other, as in some pragmatic accounts, focussed on figuration (and other related phenomena) as a product of the environmentally situated generation of ephemeral conceptual schemes. While there has been beneficial interaction between the two stances, the chapter offers a new route to incorporating insights from both.

Mihaela Popa-Wyatt expands upon a growing movement in the study of **hyperbole** to focus on its affective and emphatic qualities, rather than giving pride of place to its obvious exaggerative qualities. She shows through an array of examples that the key purpose of hyperbole is to express emphatically and richly that a target property differs in intensity from what was expected or desired, and through that emphasis to convey something of the speaker's affectabout the situation. In this work, Popa-Wyatt uses a recent framework of analysing hyperbole (along with related figures) that has been presented by the philosopher Kendall Walton, based on distinctions between "explicit content," "assertive content," and "salient contrast."[6] Popa-Wyatt also considers the frequent phenomenon of the mixing of hyperbole with metaphor and with irony. She argues that, rather than such mixing being a matter of forming a genuinely compound figure as a mix of **irony** and **metaphor** does, the hyperbole acts in a more subtle way to "tinge" the communicative effects of the other figure.

Tony Veale picks up on an ongoing debate concerning so-called deliberate metaphors by highlighting instead the notion of a potential metaphor, in noting that many texts support metaphorical interpretations regardless of their authors' intentions. He builds on the deliberate/potential distinction to model the automated generation of metaphors as an opportunistic process, whereby potential metaphors are converted into deliberate **metaphors**. He argues that the distinction between potential and deliberate is mirrored in that between signs and symbols, and demonstrates how this understanding leads to a more nuanced basis for generating and interpreting metaphors on a machine. The chapter sets into this framework the wealth of work that Veale has done on metaphor generation, including a publicly available web service that users can prompt to create metaphors, a Twitter bot that continually generates metaphors, and a more specialized system that generates highly creative, metaphorical names for colours, grounded in the real world. The resulting rich, meaningful metaphors intelligently exploit cultural norms and

6. We conjecture that her claims would carry over *mutatis mutandis* to other frameworks as well.

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stereotypical expectations about all sorts of people and objects, these norms and expectations being mined automatically from large-scaled exploration of the web in some relatively simple but fruitful ways. The chapter also embraces the power of statistical methods for language analysis that have the effect of providing subtle contextualization of concepts and thereby of metaphors generated.

Note that computational modelling of figurative production also makes an appearance in the chapter by Ojha & Indurkhya in Section 1.

3. Figurative production in areas not covered by this volume

While past work dealing with the production of figurative language is somewhat eclipsed by the quantities of work on understanding such phenomena, work on production still reflects an impressive breadth of interest in the general research community. Consequently, outside of the wide range of topics covered in this volume, there exists work on other topics which deserves mention. This section aims to sample some research in these additional areas.

3.1 Other areas of psychology

In various specialised areas of psychology, investigation of metaphor use has become established, including in research on:

- Autism Spectrum Disorder (e.g. Kasirer and Marshal 2014, 2016, 2018).
- Williams Syndrome (e.g. Naylor and Van Herwegen 2012).
- Depression (e.g. Bartczak and Bokus 2017, McMullen & Conway 2002)
- Children's language production development (see, e.g., Colston 2015: 95, 189)

In terms of broader psychological phenomena, there has long been awareness of the deep connection between metaphor and emotion, and metaphor production has been a focus of research in this area (e.g. Fainsilber & Ortony 1987, Gibbs et al. 2002, Lubart & Getz 1997). In particular, Fainsilber and Ortony (1987) carried out a comprehensive examination of the use of metaphor to express emotions such as anger, anxiety and the like, finding among other things that more intensity of emotion resulted in increased metaphor use.

A range of cognitive psychological factors are at play during the production of metaphor, with these factors affecting not only the amount but also the quality of metaphors produced. For example, Chiappe and Chiappe (2007) carried out experimental investigation into working memory as one such factor, e.g. finding that increased access to working memory leads to increased aptness of metaphors,

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and relatedly, reducing working memory access leads to reduction in quality of metaphor. In a follow up study, Pierce and Chiappe (2008) present results supporting the so-called class-inclusion account of metaphor (i.e. preference for vehicles which exemplify the category one wants to attribute to the topic), demonstrating, among other things, that metaphors are a useful tool for examining psychological phenomena.

Finally, an interesting investigation of metaphorical use, and cognition more generally, has been carried out by Beaty and Silvia (2013), focusing on the interaction between metaphor production and various facets of human intelligence. For the purposes of this study, they distinguished between creative and conventional metaphor, as well as between so-called "fluid intelligence" (largely involving rule-based reasoning, divergent thinking, and the like) vs. "crystallized intelligence" (largely to do with acquired knowledge) vs. "broad retrieval ability"; the investigation examined how these aspects of intelligence influence production of the two distinct metaphor types. They found evidence that the executive processing associated with fluid intelligence predicted production of creative metaphors, while production of more conventional metaphors was predicted by acquired knowledge, i.e. so-called "crystallized" intelligence.

3.2 Psychotherapy

Closely related to the more research-oriented perspectives of work in psychology described in the section immediately above, metaphor production has also been prevalent in the more clinically and/or therapeutically oriented area of psychotherapy. Tay (2014) provides a comprehensive overview of this area, and includes discussion of the use of metaphor by clients to symbolise emotional states, as well as supporting the development of empathy and what is termed "therapeutic alliance", i.e. when a client better aligns with a counsellor within a therapeutic setting. (See also McMullen (1996) for an earlier, close review.) Tay (2013: 3), describing psychotherapy as "involving naturalistic verbal communication between therapists and patients", provides a comprehensive account of the "clinical use and management of metaphors". Tay follows a discourse analysis methodology, which has been a somewhat popular approach in this area. This methodology has been shown to be adaptable to a variety of investigative aims (see, e.g., Roberts & Kreuz 1994), enabling relatively powerful insights about often complex phenomena.

McCurry and Hayes (1992) address the distinction between more research-oriented vs. more clinically oriented approaches, examining the overlap between these areas in the areas of memorability, comprehensibility and aptness. We will come back to some of these areas below when examining metaphor use for neurophysiology. Starting from a notion of verbal expression of so-called "therapeutic"

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metaphors by children, where such metaphors are those occurring in a therapy context, Chesley et al. (2008) extended this notion to include use of "non-verbal" therapeutic metaphor by children interacting during play therapy. They present the example of a child who has experienced domestic abuse imagining a "super durable metallic tank" which would be impervious to all kinds of extraordinary attack (e.g. from dinosaurs), as illustrating the role of non-verbal metaphor production during such therapy. A particularly interesting aspect of this work involves therapists trying to help their client change their metaphors about themselves and their lives, presented as being somehow therapeutically beneficial for the person to do this. An interesting report of such work is presented in Needham-Didsbury (2012). In addition, Angus and Korman (2002) present a detailed study of how the change in metaphors used by clients during therapy sessions can be used to gain greater understanding into the therapeutic process. See Colston (2015: 143) for some additional references and commentary on the production of metaphor in therapy. See also the chapters by Nacey and by Turner et al. in the present volume for work related to therapy.

In the context of healthcare, Demjén and Semino (2016) present a very comprehensive consideration of metaphor production for patients with physical illness. Use of metaphor here equips such patients with what is termed the "framing power" of metaphor in order to deal with unpleasant and potentially distressing experiences. Conversely, they also contend that metaphor may also contribute to less positive aspects of illness experience, including anxiety and shame. In the current volume, the papers by Nacey and by Turner et al. have similar points to make about the importance of the role of metaphor in patient experience of their illnesses. Havsteen-Franklin (2016) presents an example of where metaphor production facilitates art therapy for patients with severe depression.

Finally, while metaphor production in schizophrenia-spectrum disorder has been seldom investigated, a major study by Elvevåg et al. (2011), perhaps surprisingly, found schizophrenic patients use a similar amount of figurative language as control subjects. Relatedly, on the metaphor comprehension side, they found no difference in terms of idiosyncratic interpretations of figurative language. Their conclusion was then that schizophrenia apparently does not affect this area of cognition.

3.3 Neurophysiology

Neurophysiological research on figurative language has historically focused on comprehension rather than production, given the complication that production typically requires increased bodily activity, which will of course be reflected in elevated brain activity – solving such challenges requires development of a meth-

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odology able to handle such additional complexity. But work has also been carried out which examines the neural correlates of figurative language production.

In a novel production study that employed functional Magnetic Resonance Imaging (fMRI) to investigate neural correlates of subjects completing sentences or phrases by generating novel metaphors, Benedek et al. (2014) examined specific correlates of novel metaphor production, consistent with previous work on metaphor processing more generally. Specifically, they found that generating novel metaphor apparently relates to a region of the brain "relevant for nonliteral language processing in general – both comprehension and production – by activating and relating shared semantic information between remotely associated concepts". In addition, they found evidence, in terms of production, supporting the work of other researchers that that the brain's right hemisphere plays an important role in "the processing of novel metaphors and non-salient meaning on language".

Beaty et al. (2017) extended this line of research to investigate the networks in the brain involved in creative metaphor production. Following a similar methodology to Benedek et al. (2014), and extending this with methods focusing on functional and temporal connectivity, Beaty et al. hypothesised that "metaphor production would be associated with activation of a network of brain regions involved in semantic integration, executive control, and spontaneously-generated thought". They situate their work within so-called "creativity neuroscience", which involves investigations of interactions across networks within the brain, in particular the dynamics of such interactions, apparently reflected during cognitive processes such as planning, regulation of emotion, memory suppression and the like. Beaty et al. suggest their results point to networks of brain regions involved in metaphor production, with evidence for "functional connectivity" between these regions, as well as "temporal connectivity" showing "differential coupling at different stages of metaphor production, including dynamic connectivity between default, salience, and executive network regions". They conclude that their results overall support "the notion that creative cognition involves cooperation between brain regions associated with executive control and spontaneous thought".

3.4 Metaphor usage across languages

In the face of ever declining levels of minority languages across the world, consideration of metaphor across minority languages is becoming more and more urgent. Exemplary of work in this area is the collected volume by Idström and Piirainen (2012), entitled *Endangered Metaphors*. This title reflects a key feature of their project: when metaphors disappear so do the conceptualisations of the world

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they encode, which reflect potentially unique understandings and perspectives. This adds a certain urgency to such work, which aims to capture such information in the face of world-wide language endangerment.

Metaphor has also been widely reported in signed languages; for comprehensive overviews, see Wilcox (2000) and Taub (2001). Taub's "double-mapping" account of metaphor in American Sign Language (ASL) is especially compelling; from a suggestion that iconic signs emerge from mapping physical aspects of the sign to components of its meaning, Taub extends this to metaphor, by complementing the iconic mapping with a metaphorical mapping from source meaning to a target domain. Liddell (2003) notes the use of signs with a more concrete meaning of directing or moving to express more abstract meanings about mental processing (e.g. using the sign IDEAS-ZOOM-BY-HEAD to mean something too difficult to comprehend, using PUT modified with reference to the head to mean putting something to the back of one's mind).

A recent overview of metaphor in sign languages is presented in Meir and Cohen (2018), who in addition argue for the distinctiveness of signed compared to spoken languages, pointing out that, first, some spoken language metaphorical expressions do not retain their metaphorical meaning when translated into signed language, and second, while spoken language expressions may have the same form for both their metaphorical and non-metaphorical meanings, metaphorical expression in signed languages often involves some (slight) modification of the form of the sign. Meir and Cohen extend Taub's proposal to develop the "double-mapping constraint": "A metaphorical mapping of an iconic form should preserve the structural correspondences of the iconic mapping. Double-mapping should be structure-preserving." They invoke this constraint to account for relatively straightforward spoken language metaphors apparently not being available in signed languages; for example, they contend that the metaphorical English expression *"time flies"* and its lexical counterparts across multiple spoken languages, are not possible in sign languages, since the concept being semantically enriched is represented by an iconic sign, "whose form highlights aspects of the meaning that should be bleached in the metaphor" – in the case of FLY, the emphasis on a hand movement representing flapping, whereas "[t]he metaphor profiles speed of motion."

3.5 Metaphor and translation

Research into metaphor and translation has pursued avenues of investigation in both directions of interaction between them. On the one hand, seminal work by Raymon van den Broeck (1981) examines how metaphor reveals constraints inherent in translation, along dimensions such as:

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– "translatability": a measure of closeness of languages, in terms of contact or culture (high for languages that are closer), or of relative complexity of information (high where information is less complex, i.e. involves fewer "types" of information).
– "translational norms": where a translator chooses to adhere to norms of the source language SL (exhibiting a tendency to translate metaphors in the stricter sense), or else adhere to norms of the target language TL (exhibiting a tendency to replace SL metaphors with those found in the TL).

An important background to this kind of work originates within Descriptive Translation Studies, see for example, Schäffner (1998) and Toury (2012), where translation is seen in terms of the behaviour of the translator, as with any act of communication, being guided by so-called "norms" (regularities of behaviour, essentially socio-cultural in origin), similar to the kinds of conventions typical of all manner of communication acts.

Other work considers how translation gives rise to insights into the workings of metaphor. Schäffner (2004) usefully contrasts approaches to translation within linguistics proper, distinguishing source vs. target language, and approaches within text-linguistics, distinguishing source vs. target text. This contrast enables making a subtle yet important point that there is no guarantee that source text (ST) images will be retained in target texts (TTs), since translation does not require such a structure within the TL, or that even if associations from the SL somehow triggered associations in the TL, this does not require mapping SL associations to TL associations, and neither does the subsequent emergence of metaphor in the TL. Translation does not require SL webs of associations being reproduced within the TL: it is not the word-to-word or even concept-to-concept associations, but rather the making of word-to-world connections within the TL that drives successful translation. Schäffner concludes that "translations can make differences in conceptual metaphors, and/or metaphorical expressions explicit", and further that "analysis of texts with respect to metaphors and metaphorical reasoning processes in different languages can, thus, reveal possible cultural differences in conceptual structures." Such challenges identified within the field of translation studies have been taken over into other disciplines, such as Machine Translation (e.g. Shutova et al. 2017).

Roush (2018) presents an interesting connection between the themes of this section and the one immediately above, by examining how differing communication modes shape the conceptual level of communication, including metaphor; the specific modes focused on here are signed vs. spoken modes. Focusing on the differing material bodily experiences of users of signed vs. non-signed language, Roush proposes that when translating metaphors from spoken English source text (ST), culturally Deaf translators make choices regarding metaphors within

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the ASL target texts (TT) based on the norms of their linguistic community, with many Deaf translators demonstrating "a tacit ability to shape their translations in ways that are more acceptable to Deaf audiences than the translations rendered by hearing translators". Within Descriptive Translation Theory, techniques are available that are useful to "reconstruct and explicate the norms by which translators tacitly operate", although Roush notes that little is understood about such norms for the Deaf community. Based on such starting points, Roush proposes the following directions for investigation:

> Through the use of corpus-based evidence, several specific questions are addressed: are the main branches of Event Structure Metaphors [ESMs] – the Location and Object branches – exhibited in ASL? Are these two branches adequate to explain the event-related linguistic metaphors identified in the translation corpus? To what extent do translators maintain, shift, add, and omit expressions of these metaphors?

Roush presents a range of interesting corpus-based results, in terms of the overlap for ESMs between English STs and ASL TTs. In particular, one striking result relates to a distinct form of ESMs, Container ESMs, whereby some domain is conceived of in terms of events deriving from containers (e.g. joy described as released from within the body, the latter being viewed as a kind of container): it turns out that Container ESMs occur significantly more frequently in ASL TTs than spoken English STs. Roush presents various explanations for this discrepancy, citing differences in "iconicity, linguistic variation and culturally situated embodiment" as possible sources.

3.6 Across modalities

The study of metaphor in other modalities such as music, visual art and dance is well established. Zbikowski (2008) surveys this area quite comprehensively, in particular, spending a large proportion of this survey considering mappings between language and music, especially evident in the use of linguistic metaphor for analysing music, such mappings stemming from a common core of image-schematic structures enabling the expression of meanings in both modalities. Kennedy (2008) examines metaphor in pictures (cf. his chapter in the present volume), focusing on how it can be employed to draw attention to a specific theme, and providing a particularly interesting discussion of the distinction between metaphors in pictorial art vs. that in language, considering more or less successful examples in each. Forceville (2008) discusses multimodal expression of metaphor in other art-forms such as film, as well as other multimodal settings such as advertising. An interesting aspect of Forceville's account is how metaphor can be used to enhance coherence of a film or other form of expression, which is a crucial aspect of its role in production of all kinds. See Hidalgo-Downing and Kraljevic Mujic (2020) for a recent collection of articles crossing various modalities and considering in particular the interaction of different modalities.

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3.7 Other

As well as the areas mentioned above, there are a range of other areas in which the role of figurative language production has been discussed, albeit less extensively. However, before exemplifying these other areas of interest, it should be pointed out that, while there is strong evidence of the importance of figurative language across a broad range of human endeavour, it is also useful to determine the limitations of the role of this kind of language; for example, while humour would seem to be a natural home for metaphor, in a recent study on humour and creativity, Kellner and Benedek (2017) conclude with the interesting aside that "metaphor production and humour production rely on different patterns of cognitive abilities."

An interesting study on figurative language production in the context of religious activities is presented in Corts and Meyers (2002). The authors report on a study into the production of what they term figurative language "clusters" or bursts of figurative language. By way of providing possible explanation for this "burstiness" of such language, it is suggested that such clusters have typical features, including conceptual coherence, novelty and topicality, any of these features providing a possible motivation for their usefulness in the context of such organised events as sermons to a congregation.

Birdsell (2018) presents a very comprehensive study of metaphor production in the context of language acquisition. His main findings were that, despite variation across languages (comparing Japanese and English), differences in metaphor production turns out to be largely due to individual differences, which it is suggested could be related to various measures of creativity.

Finally, figurative language, particularly the more novel forms, often enables drawing links between conceptual domains not ordinarily related; it is therefore interesting to discover work on metaphor use for more creative pursuits crossing over into sometimes surprising areas. One example of this is the work presented in Glicksohn et al. (2001), which in part uses a tool for testing metaphor production (the *Barron Symbolic Equivalence Test*), in order to compare cognition in creative artists to that in schizophrenic patients; they find some mild support in their results for greater levels of so-called "syncretic" cognition and other related behaviour in both these groups for the majority of test tasks.

4. Final remarks: Demarcation of production and understanding

Research over several decades has shed light on the tight coupling of production and understanding, particularly during linguistic interaction. A large part of this research has stemmed from work on how people coordinate their relative contributions during complex interactional activity, from moving furniture, dancing or

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engaging in dialogue, all the way up large-scale social activities such as meetings involving hundreds or even thousands of people. Such work has led to the realisation that much of our everyday actions are *joint* actions (e.g. Sebanz et al. 2006, Vesper et al. 2017), the success of which depends on agents coordinating their contributions in order to achieve goals that are in large part social. As Sebanz et al. (2006) point out, joint action requires various capacities, including joint attention, close observation of actions, sharing of (components of) tasks, action coordination and agency; in particular, a key requirement for our purposes is for participants to be aware at some level of the contribution of others, enabling them to choose appropriate responses, so that their behaviour can then be considered more or less "intentional".

Sebanz et al. (2006) further point out that the tight coupling of production and understanding is an important feature of the coordination arising from forms of joint action such as occur during linguistic communication (not denying of course the importance of all kinds of non-linguistic information used during such coordination). Achieving successful coordination during linguistic communication crucially relies on exchange of detailed information, about what needs to be accomplished, by whom, where and when, the surrounding environment, etc. – an important question in such research is to determine exactly what kind of information is useful for achieving coordination. Furthermore, researchers have identified various mechanisms available to facilitate such coordination, from the capacity for individuals to recognise and produce signals when coordinating with one another, all the way up to the large-scale social and cultural mechanisms, such as conventions, norms and practices enabling a variety of complex actions often involving large groups of people. The literature on joint action in linguistic interaction is extensive, and involves ongoing debate over relatively foundational issues; for details on such this area; for some appreciation of the key issues, see Garrod and Pickering (2009), Brennan and Hanna (2009), Brown-Schmidt and Hanna (2011) and Kronmüller et al (2017).

A related research direction which has become somewhat established over the decade or more, although with perhaps unclear results, is the interplay between so-called "embodied cognition" (e.g. Gibbs et al. 2004, Hellman et al 2013) and processing figurative forms of expression (linguistic and otherwise). A recent example is work by Al-Azary (2018) on the role of sensorimotor processing in metaphor production in figurative suggesting speakers prefer to produce metaphors that have the so-called "body-interaction" dimension of meaning, thereby making such metaphors apparently easier to interact with.

For this reason and a variety of others, production processes may potentially be inextricably entwined with understanding processes, making it impossible to get a full analysis of either in isolation. This is worth remarking, because it could

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be increasingly important in future work on the understanding and production of language, particularly in the figurative case.

One particular type of potential intertwining is as follows. Any theory of communication/expression that has the producer (e.g. speaker) thinking about what the consumer (e.g. hearer) might understand from the item produced, and/or, dually, has the consumer thinking about what the producer means (rather than the consumer just extracting a meaning, without considering the producer's intentions) is potentially a theory where the producer is thinking about the consumer's understanding processes and/or the consumer is thinking about the producer's production processes. Now, of course, such thinking is likely to be based on inaccurate theory or simulation of the processes, one based merely on common sense and own cognitive make-up and life experience. Nevertheless, for linguistic discourse and other expressive interchanges to work reasonably well much of the time, presumably the accuracy of the thinking by producer and consumer about each other has to be beyond some threshold. Thus, the study of production ends up involving consideration and/or illumination of actual consumption processes, to some appreciable extent, and conversely the study of consumption ends up addressing production processes, to some appreciable extent. This is not to say that producers and consumers do actually always consider each other's viewpoints, processes, etc. Colston (2015: 101–133), in an extensive discussion of consumer and producer potentially considering their common ground, links the issue to the experimentally demonstrated, frequent egocentricity of language users.

Moreover, we have proposed (Barnden et al. 2004; Barnden 2020) that the understanding of partly metaphorical discourse may, paradoxically, profit from involving a form of metaphorization. Roughly speaking, metaphorization is the mental translation of some literal segments of the discourse into prevailing metaphorical terms. This is the reverse of the normal idea that an understander must, in effect, mentally convert the metaphorical segments into literal mental representations about the target subject matter. The claim is that, in interpreting partly metaphorical discourse, it can at least sometimes be useful to engage in a mix of metaphorizations and normal, metaphorical-to-literal conversions. Consider, for example, the following: "*The idea that her husband had betrayed her was buried in the dark recesses of Anne's mind. It took her months to acknowledge it.*"[7] The claim is

7. This example is slightly edited from an example found in a popular-magazine article on denial to oneself of uncomfortable truths. See Barnden et al. (2004) for the original example and reference.

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that it can be easier for the hearer to get coherent, rich understanding of these two sentences together by converting the second one in his mind into the prevailing metaphorical terms: that is, in terms of viewing the idea as a physical object and viewing Anne's mind as a geographical terrain. The acknowledging of the idea is translated into locating it in the terrain and digging it up. It is easy to understand how such finding and digging-up might take months in reality, so in that sense the metaphorized second sentence is supported by the physical-terrain meaning of the first sentence. Once an overall physical-terrain-based understanding of both sentences together is achieved, conversion of information into terms directly about the mind can be done. By contrast, suppose one just does metaphorical-to-literal conversion of the first statement into a mental representation amounting to something like *The idea's role in Anne's mind was such that it would be very difficult and time-consuming for her to use it*. Then the second sentence is just an arbitrary extra comment with no strong connection to the first sentence – the second sentence is obviously compatible with that interpretation of the first sentence, but is not strongly or specifically supported by it. Thus, if the metaphorization proposal has any merit, then production of metaphor, albeit of an entirely hearer-internal sort, can be part and parcel of metaphorical discourse understanding.

Barnden's AI system for doing the reasoning needed in the understanding of a broad class of metaphors, namely the ATT-Meta system (Barnden 2015, 2016), contains the "reverse transfer" capability needed to support metaphorization. In fact, reverse transfer, i.e. conversion of information in target terms into source terms, is routinely done in ATT-Meta alongside forward mapping, in an effort to keep the source and target scenarios cooperatively developed during understanding in line with each other, in any case of metaphor understanding. It is thus available in particular for the type of metaphorization discussed. But it incidentally also makes ATT-Meta suitable as a basis for a future AI system for metaphor production in the normal, external-expression sense. Work on developing a capacity for automatically generating metaphor in natural language for the ATT-Meta system is reported in Gargett et al. (2013, 2015).

If production of metaphor can occur during hearers' understanding, so conversely the understanding of metaphor can be expected to occur during production. It is reasonable to conjecture that, when a speaker produces a metaphorical item, she herself, at least sometimes (when there's time, she's being careful about what she says, etc.) commits an act of understanding on it, to monitor whether what she herself has produced fits her intentions.

But there is an important caveat here, with huge implications for future work on both production and understanding. It derives from the prevalent idea in Cognitive Linguistics that metaphor lies fundamentally in thought and that much thought is in some way based on metaphor. (For some relevant discussion, see

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Hampe 2017, Murphy 1996, 1997, Steen 2017, and Vervaeke & Kennedy 2004.) A radical version of this idea is that our internal mental representations of some types of situation may sometimes only be metaphorical ones: we may have no way of thinking about some situations, even unconsciously, other than through metaphor. (See Barnden 2020 for a particular development of this idea.) For instance, perhaps our common-sense understanding of minds is only metaphorical, at least when it comes to thoughts about the mind that are of any significant complexity and subtlety, beyond simple propositions that so-and-so believes such-and-such, for instance. Then, for such a subject matter T, production of a metaphorical sentence about it might involve just externalizing an existing, already metaphorical thought. Or, it might involve the conversion of a thought couched in terms of one metaphorical view about T into a sentence couched in terms of a different metaphorical view. Such conversion between different metaphorical views might be for the purpose of fitting in with the metaphorical views already used in the ongoing discourse. In short, production of figurative items may go beyond the question of how to produce them on the basis of non-metaphorical thoughts, and may sometimes involve either straightforward externalization of an already metaphorical thought or a sort of translation between different metaphors without benefit of intermediate non-metaphorical meaning.

Finally, there is a related intertwining of production and understanding, represented in this volume by MacArthur's and Musolff's chapters. Many of the produced metaphors that those chapters study are derived from those the producer has consumed. This type of successive renegotiation or development of the form and meaning of metaphors (also evident in work such as that of Cameron 2010) is an important part of the full story of metaphor understanding and production. It has a parallel in the world of irony, where, as Gibbs (2000) and others have pointed out, parties in a discourse can collaboratively extend an ironic view of a situation, often to humorous effect.

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SECTION 1

General empirical studies, with main focus on metaphor

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Producing metaphor (and other forms of non-literal language) in the laboratory

Structural and pragmatic effects as seen from the perspective of an experimental psycholinguist

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In this chapter I argue for the utility of studying nonliteral language production in the laboratory. Three aspects of nonliteral language production were provided as examples: first, inducing non-literal language in interactive communication (and identifying features of the produced language); second, using production techniques to identify the discourse context in which nonliteral language emerges and, finally, examining how production techniques can inform about the basic cognitive mechanisms that underlie metaphor usage.

Keywords: online discussion task, vehicle completion task, passage completion task, life event generation task

1. Introduction

The study of the production of nonliteral language can be found in many disciplines, including but not limited to, the study of literature, psychotherapy, political sciences, and computer science. Here I take the perspective of an experimental psycholinguist trained in the cognitive sciences. From my vantage point, the majority of research in studying figurative language production is done *in vivo* or based on data otherwise obtained *in vivo*: analyzing text or talk between interlocutors or via the study of corpora. One strength of this general approach is that the language studied is ecologically valid instances of how people use language in everyday situations and, as such, is sensitive to the variability of usage in different contexts. Again, talking as an experimentalist, I argue that a weakness to this approach is that studying language "in the wild" does not permit for the type of experimental manipulations important in identifying underlying structural factors or provide for a means of eliminating competing hypothesis.

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Consider, for instance, the use of corpora in examining language production. Big data to study language has to date emphasized distributional characteristics of a given trope or linguistic form. If one were interested, for instance, in interactive communication one would employ one or another spoken-language corpus, and, working backwards from some specific language type, attempt to identify the contextual characteristics in which various tokens of the type are employed. Consequently one is limited typically to language that already has well-known or formulaic form, such as familiar idiom (e.g., Simpson, & Mendis, 2003) or a familiar set of formulaic social conventions (such as the conditions under which recognized statements of gratitude are expressed, e.g., Su, 2017). For instance, Su (2017) calculates the frequency with which different tokens of gratitude are used (and, not surprising, saying "thank you" is produced most frequently) and then classifies the productions in various ways, such as "a Hinge Intensifier Thanking" production (e.g., saying "It's much appreciated"). The reasons for the use of this form of "thanking", rather than one of the other forms, is left hanging in this approach. From my perspective of an experimental psycholinguist it seems, paradoxically given the large databases employed, as both overly limited in identifying novel or creative use of language and overly mute on identifying the pragmatic or psychological mechanisms that might be operating in linguistic forms already identified.

In contrast to the *in vivo* approach, in this chapter I will talk about the potential utility of studying figurative language *in vitro.* My aim in this chapter is to demonstrate the potential of the *in vitro* approach describing the study of figurative language production in my laboratory using controlled experimental methodology, with special emphasis on the attempts to balance the teeter-totter between ecological validity and experimental rigor. For instance, presently, I will describe a more *in vitro* approach to the study of gratitude expression that complements the corpus approach described above.

Three aspects of nonliteral language production in the laboratory will be discussed: first, inducing nonliteral language in interactive communication, and identifying features of the produced language; second, using production techniques to identify the discourse context in which nonliteral language emerges and, finally, examining how production techniques can inform about the basic cognitive mechanisms that underlie metaphor usage.

2. Inducing the production of nonliteral language in interactive Icommunication

A true observational empirical approach would be to unobtrusively record natural conversations and note regularities in nonliteral language usage. Drew and Holt (1998) recorded the telephone interactions of a family, examining where in the

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conversation an idiomatic expression was used, finding that they tended to occur at transitional moments, signaling that a topic has been exhausted and another topic is being requested. Gibbs (2000) had students in one of his classes go out and record conversations with friends and he then analyzed the transcript to see how often irony was used (about 8% of the turns in the conversation), the multiple nature of ironic usage (in order of use: jocularity, sarcasm, hyperbole, rhetorical questions, and understatements) and assorted additional findings, such as the observation that men used sarcasm more than did women, but the reverse was seen in the use of hyperbole, and a tendency for an ironic use to be followed by the interlocutor also using irony. Conceptually, this research is an extension of the logic of corpus analyses with the advantage that one can obtain detailed information of the people in conversation. However, in both cases, there is no experimental control over the production of the trope and consequently little opportunity to experimentally manipulate variables of interest.

2.1 The online discussion task

To provide some experimental control, Karen Hussey and I (2006) set out to study social factors in the production of metaphor. We engaged participants in an online discussion task that promoted conversation even between strangers, produced sufficient metaphor for analysis, and, although conducted in a laboratory environment, remained close to naturalistic conversation.

We brought undergraduate students into the laboratory in pairs, assigning each to a different experimental room. The pairs consisted of same-gender dyads that were friends or strangers, meeting for the first time in the laboratory. The aim was to create a naturalistic conversation task that would have a high likelihood of producing metaphor from our participants. First, we chose a topic that a topic that would be familiar and natural; engage the participants (especially the strangers); and invite an extended conversation, eliciting a rich database of metaphor to submit to analysis. Given that the participants in this study were undergraduate students, we asked them to converse about their university courses, a common topic in the student's everyday communications. Second, we promoted conversations that would be more likely to elicit metaphors. We chose persuasive argumentative interchanges because of the literature indicating that the use of metaphor is promoted when a person tries to persuade people to their position (see Sopory & Dillard, 2002). The dyads each took part in two separate conversations. In one conversation, both participants acted as persuaders for an imagined other group and in another conversation only one participant acted as the persuader while the dyad partner was the one to be persuaded. Finally we had the participant's converse through a chat line both to eliminate nonverbal cues and because the output has clear conversational turns that are is easy to track and score. A chat line procedure

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has the added experimental advantage in providing for the possibility of having a true manipulation, namely in having as one of the interlocutors a confederate of the experiments trained to produce a given trope to see the reactions produced in the naïve experimental participant. We did not use that procedure in Hussey and Katz (2006) but have done so in subsequent research (e.g., Hussey, Katz & Leith, 2015).

The findings from Hussey and Katz (2006) are clear: The task reliably led to the production of metaphors: There was an average of 19.95 instances of metaphor produced by each of our participants, with the metaphors falling into four classes. Most (62%) of the productions were conventional metaphor with the rest being fairly conventional, quite novel or sample-specific slang (e.g., "the Professor is really chill"). Overall, across the two conversations 2, 444 metaphors were produced, with our male dyads producing a greater number of metaphors in each of the four categories. We observed also an interaction between the gender of dyad and whether or not the interlocutors were friends, of importance given our interest in social factors. Dyads consisting of men produced the same amount of metaphor when chatting with a friend or a stranger whereas dyads consisting of women produced the same amount of metaphor as men do when talking to friends but very few instances, and virtually no novel metaphor, when talking to strangers.

We were especially interested in the stranger condition given the marked differences in metaphor production by our male and female participants, especially the high use of metaphors with male strangers. One hypothesis we entertained was that the production of metaphor by males served as a means of identifying themselves as clever and verbally adroit, especially when interacting with other males; arguably as a marker of status or dominance. We had some evidence for this in our database because we observed several instances where one of our male participants would produce a novel metaphor quickly responded by their interlocutor with an elaboration of the novel metaphor, with the turns back and forth going with each production an attempt to upstage the other in a playful set of exchanges.

One of the advantages to the laboratory-based approach we employed is that we now had a database of metaphors, produced under similar conditions that we could use in subsequent experimental research where we, in fact, could manipulate variables of interest. For instance, in Hussey and Katz (2009) without giving information about who produced the text, we presented snippets from the original chats to a new group of students. The manipulation was in either removing a metaphor from the snippet actually produced by a participant in Hussey and Katz (2006) or introducing a metaphor into the chat snippet where there had not been one. Some of our dependent measures related to gender: did the participant think the snippet was produced by a male or female speaker? Even in the absence of gender information, both our male and female participants identified the speaker

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as male when metaphor, especially novel metaphor, was in the snippet- even if the snippet had originally come from a female-female dyad.

We found further that when we used confederates trained to produce metaphor (or not) and the naïve experimental participant believes that they are communicating with a male (or female), once again we get effects driven not by belief about the gender of the interlocutor but by the nature of the language employed. Moreover, when asked to rate the interlocutor (i.e., our confederate) along a masculinity-femininity scale, participants rated the interlocutor (whom they believed to be males) as more feminine when they interacted using literal language and the so-called "females" as more masculine if they produced metaphors (Hussey and Katz, 2009, experiments 3 and 4). This basic effect was replicated when other forms of male-gendered language was manipulated in interactive communication (Hussey et al., 2015). We take these studies as showing that men and women produce language to mark oneself as male or female, and that one of these markers is the use of metaphor in everyday speech.

2.2 The passage completion task

We turn next to work examining "thanking" for favours. We have studied the phenomenon not from the form of thanks offered (as in the corpus study described earlier) but in how the person who performed the favour acknowledged the thanks, arguing the nature of the acknowledgment is an unobtrusive measure of how the person who performed the favour feels about having done so. The experimental study of such acknowledgments was first studied experimentally by Colston (2002) who examined the comprehension of acknowledgments by placing them in short discourse contexts. Colston found that acknowledgments served various pragmatic functions that were considered as 'nonliteral" by participants (for instance, when a person responds with "anytime" when acknowledging thanks he or she is not really inviting a request for a favour at, let's say, 3 am). In our initial modification of Colston's procedure (Katz, Lenhardt & Mitchell, 2007) we employed a production task: we provided constrained discourse text and asked our participants to produce a reply as if they were the person who had performed the favour. For instance, an item would be:

> You and your friend Mary decide to go to a pizza place for lunch. When the food arrives, Mary checks her wallet and tells you she doesn't have enough money for her share. She asks you to pay for lunch. After you pay, Mary turns to you and says, "Thanks for paying for lunch."
> YOU WOULD REPLY _____

Within this simple paradigm we can experimentally manipulate many variables: for instance the cost of the favour (in terms of money, time or the like) and whether

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the favour was asked by a female or male and, because participants were also male or female, we can analyze how male and female experimental participants respond to situations where they respond to requests for performing a favour by a man or a woman, as a function of the cost of the favour and the manner with which it was requested. We argue that the nature of the acknowledgment produced for being "thanked" provides insights on how the favour-doer (i.e., the participant) perceives the situation. Overall six basic forms were identified in which the statement of gratitude was acknowledged, with the frequency with which each acknowledgment was made, as shown below.

	Participant Gender	
	Male	**Female**
Risky (e.g., "anytime")	7%	6%
Neutral (e.g., "you're welcome")	44%	38%
*Discounting (e.g., "no problem")	28%	34%*
Reciprocity (e.g., "you owe me")	8%	9%
*Do Favour Again (e.g., "feel free to ask me again")	6%	10%*
One-Time Event (e.g., "just this once")	6%	5%

As can be seen, the most frequently produced acknowledgments were of the neutral, possibly phatic, variety (e.g., "you're welcome") and those that discount the cost to the favor-doer (e.g. "no problem"). Much less frequently, although still employed each about 6–10% of the time, were acknowledgments that are risky if taken as literal (e.g., "anytime"), those indicating the favor-asker should reciprocate for the favor (e.g., "you owe me"), those that offer to perform the favor again in the future (e.g., "feel free to ask me again") and those that make it clear that the favor was a one off event (e.g., "just this once"). Overall females were statistically more likely to produce "discounting" and "a willingness to do the favour again" responses, than were men.

Two interesting interactions were observed. One interaction involved the production of a response indicating a willingness to perform the favor again in the future. Male were more likely to use this form of acknowledgment when the favor-asker was a female rather than another male and, for females, when the favor-asker was male rather than another female. On face, this suggests that this form of acknowledgment serves pragmatic functions related to showing interpersonal other-gender interest. The other interaction involved the production of the "anytime" or risky alternative which was produced more frequently when the favor-asker is another male than when it is a female but only for high-cost

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favors; for low-cost favors the "anytime" alternative is generated approximately equally for male and female favor-askers. The reverse is found with our female participants; now the "anytime" alternative is generated more frequently for male favor-askers, but only for low cost favors; for high-cost favors this option is produced approximately equally, regardless of the gender of the favor-asker. As with the metaphor data described earlier these data suggests that the language men (but not women) produce in this constrained experimental setting might reflect status or dominance when dealing with other men (i.e., in effect signaling that I have the resources that you need).

We followed up this last possibility in Katz and Woodbury (2017). The same basic procedure as discussed above was employed again but now we directly manipulated the nature with which the favour was asked to reflect dominance variables. Specifically, the favour could (once again) be asked by a male or female but now we crossed that variable with status (was the favour asker your superior or a co-worker) and by manner (was the favour asked baldly or politely) and by cost of the favour (resources needed to do the favour). A sample item would be.

> As you walk home from class, you bump into (Matt/Madeline), your (boss/a friend). (He/she) is attempting to carry a large bag of groceries home. Your home is near (or far away) from (Matt's/Madeline's), she/he says ("Can you carry some of these groceries/Carry some of these groceries") When you have dropped the groceries off at (Matt's Madeline's) house, (she/he) turns to you and says,
> "Thanks for carrying my groceries"
> You Reply _____

We categorized the responses along several dimensions relevant to dominance and acquiescing. Here I will only emphasize those aspects of the data that pertain to the dominance hypothesis suggested in the earlier study and proposed in the metaphor production studies. Our male and female participants perceived the situations identically: seeing, for instance, a favour asked by a boss or made directly as both an order and an attempt at control. Despite this similarity, males and females differed in the response they produced. Our male participants, but not our female participants, produced more accommodating responses and fewer non-accommodating responses to requests for a favor made by a male boss. Moreover, with direct requests to perform a favor, our male (but, again, not our female) participants produced more social interactive responses to bosses (relative to social equals). This category includes indication of one's place in a social status hierarchy (e.g. by use of terms such as "sir") and commentary of the manner in which they complied with the request (e.g., "sorry the driveway wasn't perfect"). I envision future tests that will complement the insights provided in corpus analysis with experimental techniques as ours, for instance manipulating the manner

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in which the thanks is offered (as identified by Su, 2017) to see the impact on the nature of the acknowledgment.

In summary, taking an experimental approach one can successfully induce the use of a given trope (as discussed earlier, for metaphor) in a quasi-naturalistic way under similar situations (persuasive argumentation). In principle this approach could be used with other tropes as well. Moreover, as shown above, this procedure produces a dataset that is amenable to experimental manipulations to identify and test specific hypotheses. Here I emphasized the role played by gender in isolating the previously under recognized role that metaphor plays in identity expression by male participants. Again, the database produced and the conditions under which it is used could be applied to the role played by race, education, social class, age and a host of related socially relevant factors not as easily identified in corpora.

The second demonstration, using an experimental gratitude acknowledgment procedure, identified that different contextual constraints play an important role in how one of the most common form of an everyday negotiation situation leads to different linguistic productions by men and women, even when the situation is perceived identically. Here I have described work that examines male / female differences in language production but, of course, the procedures can apply to any social factor of interest. And the data suggest, in a more general way, given that the dominance and identity characteristics of metaphor production has parallel effects in gratitude acknowledgments, that nonliteral and ambiguous language production might be well served through examination of usage in large cultural contexts and not as silos wherein metaphor resides in one place and other language forms reside in their own places.

3. What is the ecology that invites metaphor or sarcasm production?

In the demonstrations above, we emphasized the production of metaphor, or specific ways that people produce gratitude acknowledgments, with a focus on individual differences (e.g., gender; specific tokens of gratitude acknowledgements). Here we address the larger question of the discourse ecology that invites a specific trope. This question is important both experimentally and theoretically. Experimentally, the typical method for studying nonliteral language comprehension is to place a target sentence in a discourse context constructed to bring out, let's say either a literal (or sincere) versus a metaphoric (or sarcastic) reading.

In this common paradigm, the discourse context is based, in most cases, solely on the experimenter's intuitions about the situations that they believe invite the expected reading of the target. There is, in my opinion, too little concern on the part of the experimentalist whether in the "real world" the

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experimenter-generated context feels natural or that people find the context unrealistic or even, if the context is somewhat realistic, whether a person who was in the actual situation described would even produce the trope employed in comprehension studies. My experience is that the experimental stimuli typically employed might not be as good a reflection of everyday usage as one might wish. For instance, in a study that Maggie Toplak and I published in 2000 dealing with the pragmatics of sarcastic usage we employed stimuli from the seminal paper by Kreuz and Glucksberg, (1989), which in addition to its own important contribution to the archival literature on sarcastic irony has served as a model for subsequent stimulus construction. Almost as an after thought we asked another sample to rate the scenarios and target sentences on two 7-point scales: whether they would produce the target statement (or one very similar to it) if they were actually in the situation, and second, the likelihood they could even see themselves in the described situation. Surprisingly, about 65% of the items were rated lower than the mid-point on the 7-point scales, indicating the items were judged not overly realistic. Others also have noted and been concerned about the ecological validity of the experimental materials employed in the study of figurative language comprehension studies, and have attempted to address it. For instance Jorgensen (1996) obtained data based on asking people to remember an instance in which they were sarcastic and describe the situation that led to that usage; Turcan and Filik (2016) asked participants to rate their experimental materials in terms of how natural they seemed to them (finding that the sarcastic items were rated as sounding less natural than were the literal counterparts).

3.1 The discourse context generation task

In my laboratory we have attempted to address the ecological validity of the stimuli employed in comprehension directly, employing a novel discourse context generation task. The task is extremely simple, and is based on the same principle used in developing empirically keyed psychometric tests: identifying a set of characteristics that discriminates between two theoretically relevant constructs. For instance in Katz and Hussey (2017) we wished to see if people heard (in their inner ear) a sarcastic tone of voice while silently reading text involving sarcasm. To examine this possibility, the first step was to identify adjectives that best described the vocal characteristics claimed by participants that they heard when reading statements that could be either sarcastic or sincere. The critical manipulation was that one sample was instructed to read the statement (without any context) as if they were uttered sarcastically and another sample was instructed to read them as being a sincere. The adjectives employed were then compared and items that discriminated between the two instructional sets were identified. Follow up

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studies indicated that, in silently reading text which made salient the sarcastic or sincere reading of the target, the "sarcastic" text was described by the sarcastic-discriminating adjectives identified in the first phase whereas the same items in the "sincere" version were described by sincere-discriminating " adjectives. This effect was found when participants were asked whether on reading they imagined the voice of the protagonist in the story, and in conditions when demand characteristics were minimized, providing experimental evidence of the oft-felt experience of "hearing" the sarcastic tone of a character when silently reading.

John Campbell and I (2012) have employed a variant of this task to examine the nature of the discourse context that participants identify as inviting a sarcastic or sincere interpretation o a given statement. In principle this method could be used for metaphor, idioms, hyperbole and any of a host of statements in which what is being expressed might differ from what a speaker is intending to say. In Campbell and Katz, participants were provided with a set of items that could be understood as being either sarcastic or sincere. Example items would be : "I did great on that test" and "You are in a good mood today." For each trial, the critical statement was placed in a minimal context such "Stan and Jennifer had just finished an exam./Jennifer turns to Stan and says/, "I did great on that test." One half of our sample was asked to generate a context such that a reader would understand that Jennifer was being sarcastic. The other participants were merely told to generate a meaningful context so that a naïve reader would understand why the person in the passage would have made that statement; there was no reference to sarcasm for these participants. Again the task was highly successfully in finding contexts that discriminated between those created under 'sarcasm" instructions from those created under the "meaning" instructions.[1] These items were discriminated both on the basis of ratings provided by a new sample. Specifically, the "sarcastic" contexts were rated in addition to being more sarcastic, as displaying a failed expectation, more negativity, more likely to refer to a identifiable "victim" and as demonstrating pragmatic insincerity, each of which can be tied to one or more theories of sarcasm. Interestingly, the ratings of each independently contributed to ratings of the level of sarcasm perceived. Moreover, a finer-grained analysis of the ratings showed that not one of the theoretical bases of sarcasm served as a necessary and sufficient basis for determining whether an item was classified as sarcastic or not. Taken together these data invite a processing model based on constraint satisfaction where multiple factors unfolding online serve to produce a sense of sarcastic irony.

1. Interestingly about 10% of the created contexts generated under meaningfulness instructions induced a sarcastic reading of the target.

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Of interest we also looked at the contexts using an oft-employed objective word count program (Linguistic Inquiry Word Count, LIWC, see Tausczik, & Pennebaker, 2010) in which words are categorized into various grammatical and psychologically relevant categories. As can be seen in the Table below, the words employed in creating a sarcastic and creative context differ in ways consistent with theoretical accounts of sarcasm. Although this analysis was conducted for specific experimental aims, it is possible that the critical words and categories we identify might prove useful in building computer models to recognize and interpret sarcastic usage in text.

Percent usage (and *ANOVA* results) for LIWC categories grouped as proxies for select putative characteristics that distinguish sarcastic and non-sarcastic language

		Group		
Characteristic	**LIWC category**	**Sarcastic M**	**Open M**	**F value**
Negative Emotion				
	Negations	4.26	1.33	31.4***
	Negative Emotions	2.95	0.11	33.3***
To Emphasize				
	Quantifiers	2.18	2.50	4.16**
	Swear	0.13	0.01	2.95[a]
To Clarify				
	Certainty	0.94	1.61	14.2***
	Tentative	2.73	4.30	N.S.
Presence of Victim				
	Exclusion	3.40	1.33	28.9***
	Inclusion	3.64	4.04	6.388*
Failed Expectation				
	Sad	1.66	0.21	25.2**
	Discrepancy	0.48	0.65	2.35[a]
	Causation	0.80	1.15	3.79[a]
Temporal Marker				
	Past	8.74	9.31	6.85*
	Present	7.03	4.84	2.21[a]

$p < .10$[a] $p < .05$* $p < .01$** $p < .001$***
All comparisons at F(1, 48 or 1,49)

In another study (Bowes & Katz, 2015) we have used this technique to gather information about the discourse ecology in which metaphor is employed relative

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to the contexts generated to a matched-literal version of the metaphor. We found that the contexts produced to the metaphors contained more "cognitive mechanism" words and more idiomatic expression of emotion (e.g., " I can't stand it anymore"). Cognitive mechanism words are words that describe mental states (such as "think", "feel" intend") and has been found in a variety of situations relevant to conditions involving "Theory of Mind" (ToM) , such as with pretense, lying, interactive interpersonal contexts (rather than in those sources that use more direct language, such as in scientific writings- see Bowes and Katz, 2015, experiment 2 for a brief summary of this literature). To see whether these differences spilled over to a task that indexed ToM, we asked all our participants to complete the "Reading the Mind in the Eyes Test" (RMET), a task in which people are presented faces with only the eyes clearly shown and have to choose the emotion expressed through the eyes. RMET performance differed between the two groups, a finding suggesting that processes relevant to ToM are aroused in an ecology created to bring out it's metaphoric sense.

In summary, the demonstrations described here point to the utility of employing experimental production techniques to study the discourse characteristics that support (or create) a nonliteral use of language in writing. In fact, we do not see how the identification of the sarcastic or metaphoric contextual features we identified could have been identified in other ways. Moreover it is not clear how non-experimental techniques could have then shown that any of the discourse features identified in sarcastic text are neither necessary nor sufficient in determining whether or not an item is considered as sarcastic, or that reading metaphor creates a context that facilitates ToM abilities.

4. Production techniques to study the underlying mechanisms of metaphor

In the first section above, the focus was on using production methodologies to study the naturalistic online use of metaphor and a more constrained production task to identify motives that underlie acknowledging thanks for performing a favour (and the subsequent experimental techniques employed to see how the production data clarifies male and female usage of nonliteral language). In the second section we showed how production tasks could be used to identify the discourse contexts that support the use of sarcasm and of metaphor. The same basic procedure we argue has more generalized utility and have shown how it could be applied to the study of what one hears in their "inner ear" when silently reading. In this final section, we describe two demonstrations on how

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experimental production techniques can provide insights into the mechanisms of metaphor usage.

There are two basic approaches to the cognitive science of metaphor. In one the emphasis has been on the metaphoric expression itself. For instance, a metaphoric expression might be something such as " hate is a red-hot poker". Proponents of this approach emphasize the mechanisms wherein the meaning of one concept (the topic, e.g., "hate") is stretched, enriched and made comprehensible when paired with another concept (the vehicle or source, e.g., "a red-hot poker"). The majority of metaphor studies in cognitive psychology fall within this tradition, involving laboratory experimentation and producing alternative explanatory theories. The other approach takes the position that metaphor is a matter of thought, not language, and the mechanism of importance resides in a cognitive system involving the mapping and correspondences between cognitive domains, a tradition traced to the seminal work of Lakoff and Johnson (1980). The argument is that our understanding of the metaphoric expression "Hate is a red-hot poker" is motivated by a conceptual metaphor such as HATE IS A DANGEROUS OBJECT where properties we know about dangerous objects (such as that they could be lethal) are mapped onto our conceptualization we hold about the concept "hate"). I argue that both approaches can benefit from an experimental approach.

Naturally the first approach is already established in the cognitive psychological literature though the bulk of the experimental studies are on comprehension and not on production. In contrast to this prevailing approach, we have used production tasks to answer specific theoretical questions.

4.1 The vehicle production task

In our laboratory we have asked, for instance, what properties are important in producing a vehicle (source) concept to make an apt comprehensible metaphor (Katz, 1989). Extending a basic design introduced by Clevenger and Edwards (1988), we studied analogical metaphors of the form (A is the _____ of concept B; a modern example of this form could be: Donald Trump is _____ of U.S. Presidents). Participants were presented with a set of such items, from different conceptual domains and, with each of a large set of nominal alternatives. For instance, the alternatives could be words such as "shoe', "donkey", "cancer", "jet plane", "ghost", and the like. The task of the participant is to choose from the alternatives to produce the most apt and comprehensible metaphor. Though simple, the paradigm is potentially quite powerful with respect to the manipulation of multiple factors.

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In Katz (1989; see also Katz, 1992, 1996) the alternatives were either concrete or abstract words, to see if one type of item is preferred as the vehicle. More important, we had previously conducted scaling procedures to get indices of similarity (or distance in semantic space) between each of the alternatives made available for choice. We calculated two indices of similarity. First those based on the semantic distance between the specific alternatives employed; to use our example the similarity shared by the instances themselves such as between "jet plane", "donkey" "shoe" etc. and "Donald Trump". This measures item-specific similarities. We also calculated semantic distance between the conceptual domains involved, such as between U.S. Presidents and Human Beings, U.S. Presidents and Academic Disciplines, U.S. Presidents and Types of Vehicles. The question of interest here was to determine what the participants saw as the optimal distance between topic and vehicle in producing apt comprehensible metaphors. We found a strong preference for the vehicle to be concrete and only moderately semantically related to the topic on both the instance-based and the conceptual-domain distances. A vehicle that is too distant is felt to be less comprehensible and if too close as too banal or literal. People find it easiest to understand, and find most apt, metaphors in which the topic and vehicle are similar on features they share but the conceptual domains are moderately distance from one another. For instance people prefer proportional metaphors of the form "President Putin is the scorpion of world leaders" relative to a metaphor such as "President Putin is the Chancellor Merkel of world leaders. In the former case Putin and scorpions represent dissimilar domains (human vs. insects) but are similar on instance-specific characteristics (such as both are aggressive, active, and deadly). In the latter case, the vehicle is too close on instance-specific characteristics (both are human, long-term rulers of large countries). Items such as the latter are rated as somewhat difficult to understand and not very apt or pleasing. The instance-specific differences (one is male and one is female) nonetheless permits this to work as a metaphor under specific circumstances, such as when one is trying to make a point about gender in politics Based on individual measures of mental imagery and analogical reasoning we concluded the effects were driven by an ability to navigate semantic space and not by imagery processes.

More recently Hamad Al-Azary and myself have started to examine other factors. For instance Al-Azary (see Al-Azary and Buchanon, 2017, Al-Azary and Katz, 2017, Katz and Al-Azary 2017) examined another feature of semantic space namely the notion that concepts not only differ in distance from one another but also resides in space that differs in "density". For instance, in a metaphor such as "Joy is a balloon" the concepts "joy" and 'balloon" might be semantically close (similar) to many or to relatively few other concepts that are not be directly compared in the metaphor. The findings to date indicate that people find it easiest to comprehend, and prefer to generate, metaphors with vehicles that come from a "sparse" space.

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4.2 The life event generation task

In summary, using experimental vehicle production tasks provides clarity in the factors that people take into account in producing metaphors at the level of metaphor expression. True experimental tests of the mechanisms that underlie the second approach, namely that metaphoric expressions are motivated by underlying conceptual metaphoric mappings are rarely found in the experimental literatures, even though the postulates of the theory are well defined. For instance, in principle one can test whether conceptual metaphors are automatically activated on encountering metaphoric expressions or, at least, in identifying the defining conditions under which they are activated online.

Here we approached the tenets of conceptual metaphor theory with a production task. Consider one of the classic conceptual metaphors identified by cognitive linguists, LIFE IS A JOURNEY. These linguists point out the correspondences: life is like a journey having starting and ending points, the course of life of a person is like a traveller on a route, in life as in journeys one might face impediments and so forth. Tamsen Taylor and I (Katz and Taylor, 2008) reasoned that if people think about life in the metaphoric sense of a journey, it should be manifested in a semantic memory production task. Our participants, university-aged students (around 21 years of age), were asked to list, in any order that they wished, specific life events that would have happened to an average 70-year-old man or woman. Please note there was no reference to journeys or to any other way to structure how one should report on life. Our expectation was that, if people possessed a LIFE IS A JOURNEY metaphor, by referencing a 70 year old, we would be activating the notion of a person who has travelled far along the life road. We also made certain predictions. We predicted that people would use a linear output order, starting at an early age and proceeding temporally (although outputting most important life events regardless of age could be a viable strategy). We predicted that if the conceptual metaphor is based on cultural and lived experiences then we should get high participant agreement on when certain life events (landmarks) would occur and the emotional reaction each produced. Each of our predictions were observed. Output was in a temporal-forward manner. Almost 100% agreement was found on where (the age in which the) the landmark event on the path of life would occur, and the affect produced. The effects replicated when the production data were compared to data obtained from participants presented with the life events produced by 5% or more of the sample and merely asked to check off which events they thought would occur perfect. Clustering techniques identified sub-journeys (e.g., RELATIONSHIPS ARE JOURNEYS embedded within the larger journey, a feature predicted by Lakoff (1993).

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In summary, across the four studies described in Katz and Taylor we found that the "LIFE IS A JOURNEY" metaphor is aroused when people are explicitly asked to list events that makes salient the later parts of the life course and when people think of "LIFE" events as occurring in a linear or forward sequential manner (Study 1 and 3). We found the metaphor was not aroused when life events were presented in an episodic memory task, arguably because the "LIFE IS A JOURNEY" script is non-diagnostic as a retrieval cue and better retrieval cues are available when specific chunks of life are considered (i.e., participants use a strategy in which they remember an event, most likely a highly salient one, and then attempt to remember other related sub-journey events similar to it). In a more general sense, these data indicate that experimental procedures can profitably be employed in the study of conceptual metaphors.

5. Concluding comments

The exercise in this chapter was to make the argument that there is much to be gained from using traditional experimental approaches in the study of nonliteral language based on production techniques and not, as more usually found in the experimental literature, on merely presenting pre-packaged stimuli to see if and how they are comprehended. At its heart, my use of the production methods described here is based on considering the ecology in which nonliteral language resides and in designing lab-based approaches to explore that ecology. The demonstrations I provided here on three different (albeit related) questions I hope is persuasive in arguing for the utility of production procedures in providing novel insights that have not emerged from non-experimental approaches nor from approaches based on reception based experiments.

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Metaphor and one-off pictures

Touch and vision

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All representational media support tropes. This chapter considers pictures and asks how *pictorial metaphors* can be devised by people with relatively little experience in the medium. The examples considered are raised-line drawings devised by blind children and adults. In some, the shapes of objects are anomalous but apt. In others the use of a line contrasts with its use in outline drawings – for example, *atmospheric* lines surround a target object. The blind and sighted concur on the meaning of pictorial metaphors. The theory of metaphor in drawings presented here treats perception, outline, realistic shape and departures from realism. Pictures have primary meanings, and metaphoric pictures require secondary meanings.

Keywords: picture, metaphor, tactile drawings, blind, children, line, outline, surface, edge

1. Introduction

Why might wheels go inside cars? Or become rectangles? Drawings of cars invented by a blind child (MT) from Taiwan, asked to solve drawing problems, include such novel "one-off" wheel metaphors (Figure 1). They use size, shape and container tropes, unrealistic twists on reality. MT is far from unique. It needs little experience to understand pictorial metaphor. Indeed, literal and metaphoric pictures should work for the blind and the sighted. I will suggest several kinds of metaphors suit pictures, and why, analysing drawing devices that represent speed, emotion and a host of targets which cannot be copied mimetically in a drawing.

Every feature of a representational medium can be used in a standard, primary way, and figuratively in novel ways. For example, if Dad returns home to find his teenager has cleaned up his room, inventively he might present a battlefield medal to his teen "hero." A metaphor deploys a device (usually a word, of course) in a secondary mode because its primary mode contains a feature of the topic at hand.

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"Lawyers are leeches" uses leeches (suckers of vital fluids) to suggest lawyers subsist without merit on the hard-earned riches of others. Offering an idea to be entertained, the claim about lawyers and leeches is not meant to replace the primary definition of "lawyers." Or leeches! Pictorial metaphors can use devices proper to one meaning to offer a secondary one. Wriggly lines surrounding Spiderman's head show his "spidy" sense alerting him to danger. The sense is invisible, but it is portrayed, and wriggly lines would often portray dangerous snakes homing-in on prey. The wriggly lines have a primary meaning (snakes) and the primary use has a feature (danger) relevant to the comic-book character. The secondary feature is "something dangerous, but not snake-like, this way comes."

Pictures suit metaphor. Picture elements such as lines form shapes, and the elements and forms have default or salient uses (Giora et al., 2017), so a contrasting use can be figurative. A shape can be accurate according to some canon (Goodman, 1968; Bouissac, 2014), and a figurative use can be used in contrast, as in drawing a gaffe-prone starlet tripping over her own, unrealistic, hugely-high heels. I will describe picture tropes such as hyperbolic heels as *metaphors*. Since mere familiarity with default use of line and shape makes contrasts possible, pictorial metaphors can be invented by blind people exploring the medium, as neophytes, tackling new problems. Tropes are shown here in drawings by a child (MT) from Taiwan, a man from Turkey (EA), and a woman from Japan (EW). For instance, EA drew moving wheels using *space as time* and *length as speed,* and, in a *pathetic fallacy*, made contexts sympathize with actions of a target object. Further, EW, on her own initiative drew dense *tangles* for her *thoughts*. Her topics spanned the ontologies from matter to the mind and morality.

MT and EA typically create metaphoric shapes. EW uses metaphoric lines around target objects to create an "atmosphere." To interpret their work, I offer a theory that includes inventive departures from literal use – often apt and good-humoured, I find.

2. Cars in motion represented by a blind girl

MT, a blind 12-year-old from Taiwan, created novel tropes, metaphoric pictures of cars (Chao & Kennedy, 2015).

MT was but 12 years old when she drew Figure 1. Light sensitive at birth but without form perception, she has been encouraged by her mother since age 4 to draw with crayon on paper with a mesh backing. More recently, she has been using a raised-line drawing kit, a board with its front rubberized and its back stiff. A plastic sheet rests on the softer side. Ballpoint pens writing on the sheet leave raised lines – the fine lines in Figure 1.

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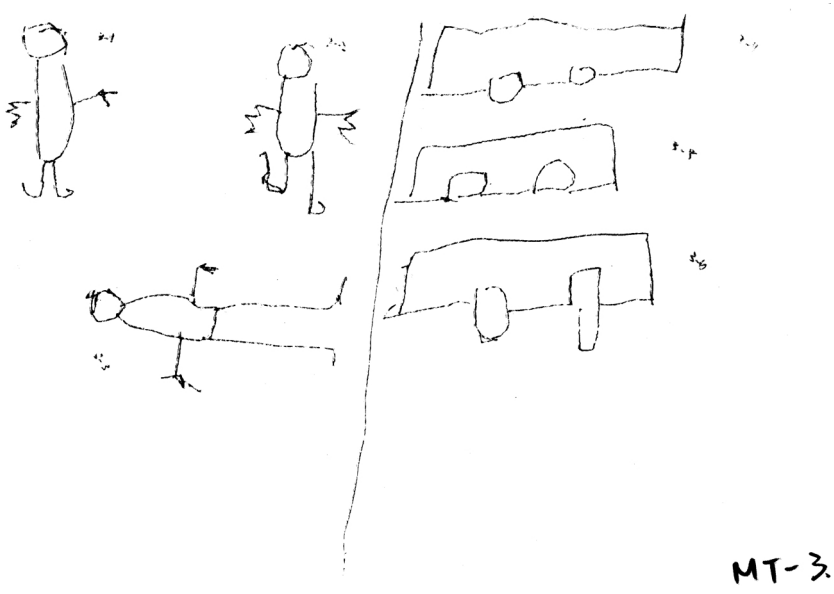


Figure 1. People standing, walking and lying down. Cars in motion, stopped and braking. Raised line drawings by MT, blind girl of 12. From Chao and Kennedy (2015) with permission of *Perception,* Sage Press

At the time of testing by Hsin-Yi Chao, MT usually drew every week at home or school. MT's mother taught her to combine simple forms such as squares and circles to draw larger forms such as a house. On her own initiative MT drew scenes such as a table and chairs. Saying "good" or asking her to try again, MTs mother helped her use shapes similar to those in the world. Discussions with MT's mother and teachers found no indication she was taught to draw metaphoric pictures.

MT was asked to complete a series of drawing tasks (as in Kennedy, 2003). In some of the tasks, MT drew a person standing, running and lying down, and then a car moving, stationary and braking. The car puzzles are novel for her, observation indicates.

It comes as a surprise to most people that blind people can draw. At great cost to the blind, in the history of thought it was regarded as a contradiction in terms (Eriksson, 1998). Since the late 1700s, progressive educators offered the blind education in the crafts, reading, math and music, but there was no body of thought arguing that pictures are as natural for the blind as for the sighted, quite the reverse (Eriksson, 1998; 26–47; Axel & Levent, 2003; Feeney, 2019; Vinter, Bonin & Morgan, 2018). A little thought about shape and touch banishes the sense of a contradiction (Kennedy, 1993; Hopkins, 1998; Heller, 2002; Cabe, 2012; Picard & Lebaz, 2012; Picard, Albaret & Mazella, 2014; Vinter, Orlandi & Morgan, 2020).

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Shape is available to touch and vision, and drawings use shape. Notably, surfaces and their edges are tangible as well as visual. Pictures use lines to show shapes, and lines can be tangible as well as visible. This is no more than common sense. Offering a step beyond these obvious claims, evidence today reveals that in vision, without need of explanation, lines stand for edges of surfaces (Kennedy, 1993). From this important finding flows an implication: blind people, children and adults, might understand line drawing spontaneously much as the sighted do. Indeed, research since 1970s has found that, spontaneously, in touch for the blind just as much as in vision for the sighted, lines stand for edges of surfaces (Axel & Levent, 2003; Heller, McCarthy & Clark, 2005; D'Angiulli, Kennedy & Heller, 1998).

A factor to consider here is that a surface's edge is present in the world, but there is no line at the edge. Does that mean that the line in an outline drawing that stands for the edge bears a metaphorical or other figurative relationship to the edge in the represented world? Assuredly, the line and the edge are different, but the question deals with two levels of analysis, a primary and a secondary one. The primary level can be taken as literal, and the secondary, which can go against the primary's principles, as metaphoric. (If line representation of an edge is taken as metaphoric, a violation of the rule that lines stand for edges offers a secondary metaphor based on a primary metaphor i.e. "metalepsis" (Vicari, 1993).)

A line stands for an edge, primarily, in outline drawings. In perception, physical edges and lines – be they continuous, dotted or dashed, rough or smooth, vague or precise – trigger shape functions in the cortex, $y = ax + b$ and the like. The functions support impressions of foreground surfaces ending at the edge. The foreground surface can be on one side of the line, like a profile, but it can be on both sides, like the interior corner of a room. Perception freely adopts either option, depending on the other lines in the drawing that provide a context for the line we are considering.

A surface is a polarized plane, and a foreground surface has space between it and the observation point. Perception's analysis of an outline drawing yields polarized planes circumscribed by edges – profiles and corners. Some drawings have unrealistic shapes, and may be metaphoric, as in a nose shape exaggerated to make a point about a character. Lines for ideas radiating from a forehead, to show a sudden insight, are unrealistic too. They are not profiles or corners. Line depiction of edges is primary, a default use of line (Giora et al., 2017), understood without training in a convention (Kennedy, 1993). Other uses, perceivers note, can clash with the primary. If so, primary use (accurate profiles, and lines as edges) and secondary uses (unrealistic shapes, and lines not showing edges) are two distinct levels of analysis. If so, observers should distinguish the two levels, and, if pressed to describe pictures, should borrow the terms literal and metaphoric from descriptions of language, in which literal use is primary, and metaphoric is secondary.

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A New Orleans house may be shown realistically, but if invisible currents of magic are added as swirling eddies around the house, the eddy-lines are metaphoric. (Later, let us consider how a picture in a realistic style can be metaphoric.) Deliberately differing from a primary case can put a metaphor in play. A metaphoric picture is unlike a fantasy showing an alternate universe. Their nonstandard means (spidy snakes, magic eddies) suggest a feature of the topic, not the physical scene. Naïve observers sometimes need a caption or an explanation, and then the pictures should be deemed metaphoric if observers are asked explicitly if they are literal or metaphoric. Key is that metaphoric pictures differ from standards that come intuitively and immediately to untutored observers, blind and sighted but are not conventions like maps or diagrams or characters like @.

Modest experience with pictures is enough to invent metaphors on the fly. "Metaphors provide instances of creativity not only in speech and written text, but also in images and other modalities" (Ohja, Indurkhya & Lee, 2017, p. 6. On image, word and music see also Kennedy, V. R., 2015). Discussing recent research on pictures and the blind from many countries, Hayhoe (2017) noted that it might yield a "universal understanding" of "visual metaphor beyond vision" (p. 43), and allow us to observe creativity in a group with little experience with pictorial culture, for many supposedly visual concepts may not be "reliant on a single sense" (p. 42). People could concur on metaphoric shape, and metaphoric use of line, the blind with the blind, the sighted with the sighted, and, most significantly, if the world of touch is based on the same shapes as vision, the blind with the sighted.

Showing postures found in pictures by sighted children (Golomb, 1992), Figure 1 reveals MT draws much as her sighted peers do. For convenience in a 2D drawing, her people "standing" and "lying down" have feet pointing in opposite directions (as in Golomb, 1992, Figure 49b). Her "runner" has one leg bent in a U shape, and one straight (comparable to Golomb, 1992, Figure 54a). Legs bend more in running than in walking, so this picture uses a feature of actual runners. The lowest body is horizontal, a format taken by sighted and blind adults as "lying down" (Kennedy, 1993), quite possibly because from a vantage point to the side of a bed, someone lying down is oriented horizontally across our median plane. In short, these schematic pictures of people copy aspects of objects and use features common in the drawing development of sighted children. Albeit in a childlike fashion, the features show real features of the world. If so, they can be called literal pictures.

The shape of the runner's leg has a mixture of features. Legs bend in running, but do not become U-shapes. The leg is drawn realistically in that key features are meant, though others are not. The bend is meant, and the false U-shape is not relevant, and so not an error.

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MT's metaphors to do with cars are not part of any well-documented sequence of drawing development in children (Kennedy, 1993). They are more inventive, spur-of-the-moment, an aside, a *jeu d'esprit*. They are also apt.

At the top of Figure 1 is a car being driven, in the middle is a stationary car, and the final drawing is of a car braking. The moving car is in profile, a quadrilateral. Roughly circular wheels sit along the lower line of the chassis. In a clever twist, for the stationary car MT put the circles for the wheels inside the car, atop the line for the base of the cab. For "brakes on," the wheels are shown as rough rectangles, the "front wheel" (on the right) tall (1.7 times the height of its partner). Further, the moving cars are long, 20% longer than the stationary car. MT said the moving car heads to the left, and she drew the line for its front large, 1.6 times larger than the rear. The stationary car is more rectangular – the vertical line for the left end is .9 the line on the right. The braking car is moving to the right, MT indicated, and stopping suddenly, shown by the front wheel (on the right) being drawn larger than the rear wheel (1.6 times larger).

Unrealistically, large size means "front." The size difference is "marked", with "larger" indicating the front and the direction of motion. Inventively, wheels fit inside the chassis to render a car stationary, and become rectangular for braking, unable to rotate smoothly.

Deft, the car devices require some explanation, but then appear valid and good-humoured, I suggest. They use size, shape and containment metaphorically. Surely no one thinks wheels are absorbed when cars stop, or become rectangles in braking. If so, blind people as young as 12, an age when verbal metaphors can be invented, can draw imaginatively, deliberately and effectively, with idiosyncrasy, in forms of representation that lie beyond mimesis.

Children half MT's age often draw fancifully in ways that may be metaphoric. Kennedy (1993) mentions Cel, aged 6. Drawing a runner, Cel drew the legs and arms "really long" to show the person was running really fast. But then he drew the runner's ears "real long" too. Are Cel's fancies just incidental? The arms and legs are quite relevant to running but surely applying extra length to ears is witty, a good joke. If so, Cel expects comprehension of the long limbs, and wants a smile for the long ears. The ears are a deliberate aside from the subject of motion. The humour lies in repeating a device to the point that it becomes irrelevant. Checks for deliberate irrelevancy, as distinct from deliberate apt error, could show that a very young child's intent is humour rather than metaphor. Cel may even have thought that a person with long legs and arms can run really fast, though on the balance of probabilities the long limbs are metaphoric. He certainly would not have imagined long ears give you speed.

Like long ears, on the face of it MT's drawings are deliberately unrealistic, but unlike long ears, their devices are pertinent to the topic. The metaphor theory of

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pictures described here holds that one way to be metaphoric is to offer imaginative sizes and shapes (e.g. rectangular wheels) that contrast with the usual referent – the primary meaning, wheels –- and are intentionally false (not round). Thereby, MT conveys features of the target cars (braking) via a secondary meaning (rectangular wheels, unable to roll smoothly).

3. Wheel metaphors by EA

Remarkable wheels in motion (Figure 2) were also drawn by EA, a congenitally totally-blind adult from Ankara (Kennedy & Merkas, 2000; Burk, 2016), who has made drawings since childhood. As is the case with MT, the tasks were novel for EA. Joan Eroncel translated the terms static, moving, in jerky motion, wobbly, too fast to make out, and brakes-on into Turkish for EA. (Ms. Eroncel brought EA to the attention of science, and richly deserves recognition.)

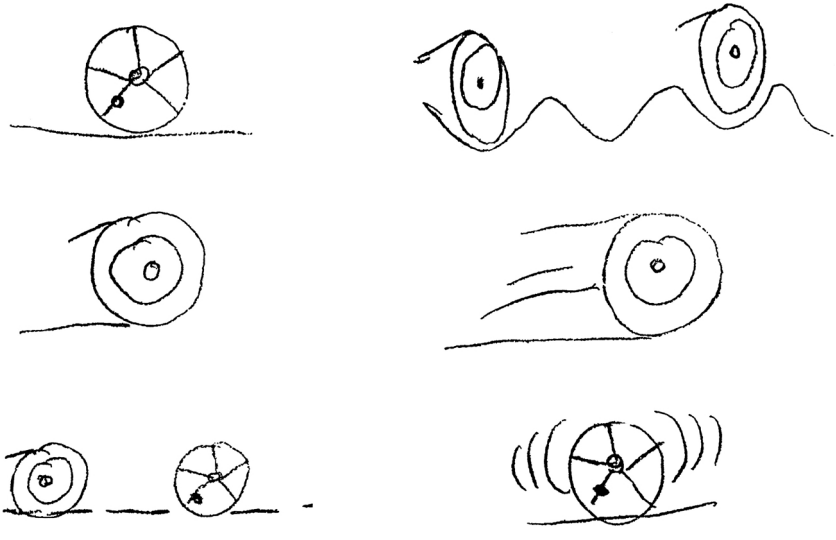


Figure 2. Drawings of wheels in motion by EA, (left) static, moving, in jerky motion, (right) wobbly, too fast to make out, brakes on. From Kennedy and Merkas (2000) with permission

A static wheel with 5 spokes he drew as a circle with 5 straight lines radiating from the hub to the rim. As a tangent to the base, he also drew a ground line on either side of the wheel. He added a dot to one spoke. He said the dot was a detail, and if a detail was evident the wheel was not moving. For a wheel spinning steadily, he drew a circle with smaller circles inside it, and his ground line only on the left side of the wheel. He added a short horizontal line at the top of the wheel, stretching

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to the left – an "action line" (Juricevic, 2017), "motion line" or "speed line" (Cutting, 2002; Cohn, 2013, p. 108–9). The dot was not shown. He was asked to draw a wheel in jerky motion. In a *hendiadys*, in which two stand for one, he drew two wheels, one like the static-wheel drawing, and one like the wheel spinning steadily. Joining the base of the two wheels, EA put 5 dashes in place of the continuous ground line. Both jerky motion and dashed lines use interruptions. For a wheel in wobbly motion, he drew two elliptical wheels (hendiadys again) similar to the spinning-wheel sketches, and added a wavy ground line (a rough sinusoid). For "a wheel spinning too fast to make out," EA drew the spinning wheel design, and in a *hyperbole*, doubled the lengths of the ground line and the line at the line at the top of the wheel, and added two more horizontal lines, between the top and ground lines. In this drawing, more and longer means faster (Cohn, 2013, p. 108). For a wheel with its brakes on, EA drew the static wheel, ground line on both sides, and added brackets to left and right, as in (((O))).

What makes EA's metaphors work? Omission offers an implication: Lines omitted are spokes not perceived because of speed. Partial omission of a ground line is an etcetera: The ground line is dashed, incomplete, in sympathy with the wheel, a *pathetic fallacy*. Time converts to space: Circles replace straight spokes to represent circular motion across time, and horizontal speed-lines show a path of motion (Kennedy, 1982; Carello et al., 1986; Juricevic & Horvath, 2016). "In a picture depicting a person running, inclined body orientation (which occurs in the real world when a person runs) would be a literal pictorial device, whereas action lines (which do not occur in the real world regardless of how fast a person runs) would be a metaphorical pictorial device" (Juricevic, 2017). Distortion of the topic object: Wobbling makes a wheel shape elliptical, like the wheel's path of motion. Pathetic fallacy – the context shows sympathy: the ground line is dashed in sympathy with the jerky wheel's on-again, off-again movement. Hendiadys: EA used this twice, drawing two circles for jerky, one for static and one for moving, and one for the wobbly wheel at one location, and another at a later location. The wavy ground could be wavy in sympathy with wobbling, or cause a wobble.

Like an ampersand, EA's indicators might be no more than pure conventions. Two studies tested whether they could be understood without a convention being explained. In the first, 24 sighted undergraduates assigned labels to the sketches. The drawings were shown in sets of three. One group of sketches was the static, spinning and jerky drawings and the other was wobbly, too-fast-to-make-out and brakes-on. The volunteers were given 3 labels, such as "a wheel in wobbly motion" on each trial, fitting the set of three sketches, but without being told which of the 3 labels intended which sketch. The wheels were usually assigned EA's labels with 100% agreement. The exception was the "brakes on" sketch. It was assigned "too fast" 6 times, and "too fast" was often called "brakes on." Since the ((( ))) arcs of the

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"brakes-on" drawing can be taken as the wheel's rim being shown in part, as if it was only perceived on occasion, "too fast to make out" is surely a reasonable option.

Evidently, EA invented metaphoric devices for motion that make sense to the sighted, and disagreements have a ready explanation.

In a second study on EA's devices, all 6 labels were given along with the 6 sketches. 17 of 24 undergraduates assigned the labels correctly 3 or more times out of 5. "The only picture rarely correctly assigned was the one intended as brakes on [the (((O))) drawing], which was labeled steady 9 times, wobbly 5 times, and jerky 4 times but only assigned brakes-on 4 times. It was also called too fast twice but, interestingly, was never called static" (Kennedy & Merkas, 2000, p. 703). It may be taken as steady spinning because it is symmetrical, wobbly because each arc may depict a momentary location, and jerky because each arc might depict a momentary stop. A static wheel needs no extra device. It is "unmarked." It is the "default" case (Giora et al., 2017).

EA's novelties are like MT's. Both change the default shape to suit the goal. The changes indicate common features of the topic and vehicle. The pictures are false – wobbling wheels do not become ellipses. But wobbles have biases in direction, perhaps mostly being up and down. Putting the long axis vertical can suggest the bias. Likewise, grounds do not turn into sinusoids as wheels wobble, but the false shape has a relevant feature, in this case a path of movement, a spatial sinusoid, across time. Unlike MT, EA adds pathetic fallacies.

4. Five wheels, five metaphors

Sighted volunteers appreciated EA's intent to a significant degree. Perhaps metaphoric shape has similar significance in vision and touch, so the blind and sighted concur. Kennedy and Gabias (1985) prepared 5 sketches with what might be metaphors for motions (Figure 3). They tested them on sighted and blind adults, asking if the sighted agree on the meaning of the sketches, and whether blind people, despite their relative unfamiliarity with pictures, would also, and if so, would this be on the same meanings, and if they would concur to the same extent as the sighted.

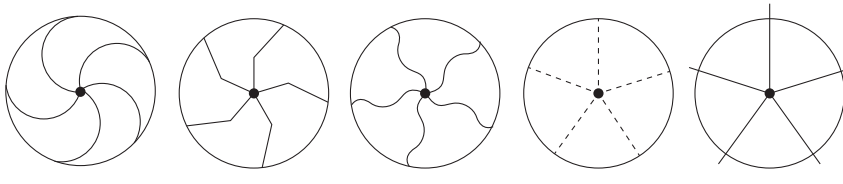


Figure 3. 5 wheels and 5 motions. Steady spinning, jerky, wobbly, too fast to make out and brakes-on

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The wheels were shown to 18 sighted undergraduates and 18 blind adults. The sighted were shown black-and-white outline drawings and the blind had raised-line drawings. Each of the 5 wheels was a circle. One wheel had 5 curved spokes (each was C-shaped). Another had 5 bent spokes (each was V-shaped). Another had 5 wavy spokes (sinusoids). In a fourth each spoke was a dashed line. The fifth had each spoke extend slightly outside the circle's rim (like a capstan). The sighted and blind volunteers assigned 5 labels (offered in random orders) to the wheels. Once again the labels were a wheel spinning steadily, a wheel in jerky motion, a wheel in wobbly motion, a wheel spinning too fast to make out, and a wheel with its brakes on.

The blind and sighted volunteers concurred. They assigned the labels to the shapes as follows: curved = steady; bent = jerky; sinusoid = wobbly; dashed = too fast to make out; extended = brakes on. For too-fast-to-make-out, equal numbers of blind and sighted volunteers, 13 in each group, picked the dashed spokes. 12 out of 18 in each group assigned the label jerky to the bent spokes. For wobbly motion, 11 of the blind and 14 of the sighted picked sinusoidal spokes. The curved spoke was generally taken as meaning steady spinning (10 of the sighted and 12 of the blind), but occasionally it was assigned one of the other motions (maximum of 3 times for any other motion, in either group of volunteers).

A dashed line can indicate too-fast-to-make-out because the unfilled sections of the line can suggest the spokes are not observed fully. A V shape can indicate jerky motion because it changes its orientation abruptly. A sinusoid can indicate wobbly motion because a wobble traces a sinusoid across time. C-shape spokes may suit steady spinning because the C is a continuous curve, with no change in curvature. The spokes extended beyond a rim can suggest the brakes being applied.

Besides their most common response, observers at times agreed on a second choice. This suggests that some features of a shape are selected as apt for some purposes, but another feature is available and is less salient. Perhaps a third feature is available, but is even less salient. If so, there may be remarkable agreement on primary, secondary and tertiary metaphoric meanings of a shape. To test this possibility, a group of 11 sighted college students, and a group of 15 blind college students were asked to rank from 1 (best) to 5 how well each of 5 spoke shapes suggested "steady spinning." The mean ranks from the blind were: curved 1.2; bent 2.3; wavy 2.7; dashed 4.2; extended 4.7. The sighted students gave the same rank order as the blind.

Evidently, the blind and sighted volunteers may be in strong agreement on the salience of novel, unrealistic pictorial devices. Their experience with pictures is of entirely different orders of magnitude, but they concur on ranking novel pictorial metaphors. With minimal prompting, even grade schoolers understand motion devices (Kennedy & Gabias, 1985). Kindergartners might not be far behind.

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Indeed, since other species recognize pictures (Wynne & Udell, 2013, p. 39–45), there is good reason to expect they might pair really-moving wheels with static pictorial metaphors. To the extent that pictorial metaphors rest on mechanics of shape and motion perception shared across species, the more salient a pairing for human observers, the more other species will be successful, surely – a tantalizing possibility, I suggest.

A caution about the problem of induction: Why some devices have high-priority referents – default meanings – and other referents rank progressively lower is still an open question (Forceville, 2006; Ojha, Indurkhya & Lee, 2017).

5. Disclaimers tag metaphors

MT's cars and EA's wheels are unrealistic. Authors of metaphors should sense their inventions are metaphors. To check this conjecture, Kennedy and Domander (1986) looked for disclaimers, distinctions between literal and metaphoric devices, in comments from the blind as they drew pictures.

Kennedy and Domander (1986) asked 15 blind volunteers to draw subjects that might require metaphors – a hand in pain, the wind, a person yelling, smelly garbage and a hammer hitting a table and making a loud noise. For the volunteers, this was a novel challenge. They said they had not drawn these before. We studied their comments. For example, one volunteer said, "This line is imaginary. I guess anyone [examining it] will have to realize that." People drawing a table do not call their lines imaginary. The use of the disclaimers sets the line apart, in the fashion that metaphors are often accompanied by the reservation "well, not literally" (Roncero, Kennedy & Smyth, 2006). At times the volunteers said a picture contained something "anomalous," "unreal," or "abstract." On occasion they said a line was not like the other lines in a picture. In the 75 trials, there were 40 cases with disclaimers of this kind, for example an "imaginary aura of pain" around a hand. The disclaimer is the word "imaginary." No one says the hand is imaginary.

The drawings included lines emerging from the blow of a hammer on a table and bouncing around a room (showing loud noise) and vertical lines above smelly garbage (showing scents wafting upwards). As they invented these sketches, on more than 50% of trials the volunteers used disclaimers for devices like lines for sounds, smells and pains. Disclaimers suggest these lines are metaphoric to the blind. Disclaimers did not accompany lines for edges of surfaces of hands, tables, hammers and garbage. The absence of disclaimers suggests these lines are literal for the blind.

In addition to the study on disclaimers, Domander and I asked 3 blind adults to draw spinning wheels and posed explicit questions, such as "is your [device]

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literal or metaphoric?" They said their devices for spin were unreal, imaginary, might have to be explained to children and were metaphoric. Lines standing for parts of the wheel (hubs and rims) were realistic, did not need explanation, would be easy for children, including blind children, to understand and were called literal.

Evidently, a novel picture can use shapes of objects known to vision and touch, and include shapes deemed to be metaphors, including ones to do with motion. The evidence shows the result is understood by sighted adults long familiar with pictures, and equally by relative novices, blind adults who have little or no exposure to literal or metaphoric pictures.

Proficiency with metaphors may increase with age. Though MT was deft at age 13, Kennedy and Domander's (1986) youngest participant, a boy aged 13, did not produce any metaphoric devices. In this connection, Gaia, a blind girl of 13 from Rome was asked to draw wheels in motion (Kennedy, 2003). It is striking that she said a picture couldn't do that, that a moving wheel could not be drawn. Why MT and EA are more flexible is worth investigation.

Likely, Gaia was judging that static pictures by their nature couldn't show wheels in motion. They are static! Of interest, she was not saying that she did not know how, that her understanding of pictures was inadequate. Rather, she recognized the limits of the medium – the substance of drawing (Laursen, 2017) – not personal limits. Literal representation sets limits driven by perception, not just popular "norms" (Bouissac, 2014). Widening the scope of pictures enormously, violations of the limits offer new possibilities provided the rationale is apparent.

6. EW's ontologies

The blind produce metaphoric drawings on request, and concur with the sighted on pictorial metaphors. From such effective comprehension it follows that the blind might produce metaphors at their own behest. Just so, EW, a blind woman from Japan, on her own initiative devised pictures that reveal the enormous range of metaphoric sketches (Kennedy, 2008, 2009, 2013, 2014a,b, 2019). Their vast scope crosses from one ontological realm to another, from matter, the senses, psychology and morality to aesthetics. Often she created what she termed an atmosphere or impression using lines that, I argue here, are metaphoric.

In Figure 4, EW (with a stick) and her husband M walk alongside a sandy beach in Toronto. Waves on Lake Ontario come to the beach. Diagonal lines above the heads of EW and M show wind. Distal, wind above one's head can be sensed from the proximal tugs of wind on the body – one line crosses her body – and sounds. In a way, lines for wind are both literal and metaphoric. A current of wind is invisible but its borders are tangible. Concentrated rushing air from a hand dryer is invisible, but has well-defined tangible borders. To draw wind may be

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metaphoric for vision but literal to touch, an EW comment about water currents indicated. In a picture of herself swimming, drawn on a trip to Mexico, lines like spider webs radiate from her fingers (Figure 5). These stand for the feeling of water running through her fingers. She wrote of these that people experience "moving their arms and hands through the water and feeling the sensation caused by those movements. So some people can perhaps edentify [sic] with those lines for the water going through the fingers while swimming. However, those lines for the water are more of tactile experience than visual, so those lines are perhaps not necessarily `loyal' to what you might see while observing somebody swimming in the cave… But those waves also represent yet deeper emotional experience of feeling free and sort of liberated, floating through the cave, a kind of feeling that makes you want to shout with joy. That is solely subjective. So those lines for the water show a range of experience…" (EW, May 1, 2007, in Kennedy, 2008).

EW's disclaimers, I suggest, are evidence that the lines for water streaming through her fingers might be, like the lines for wind in Figure 4, metaphoric for the sighted but perfectly literal for the blind. A sighted person drawing edges of invisible currents, taking the edges to be tangible but unseen, should deem their picture to be metaphoric. But a blind person's tactile perception of air movement involves edges in a way that is much like a sighted person's perception of a visible object's edges.

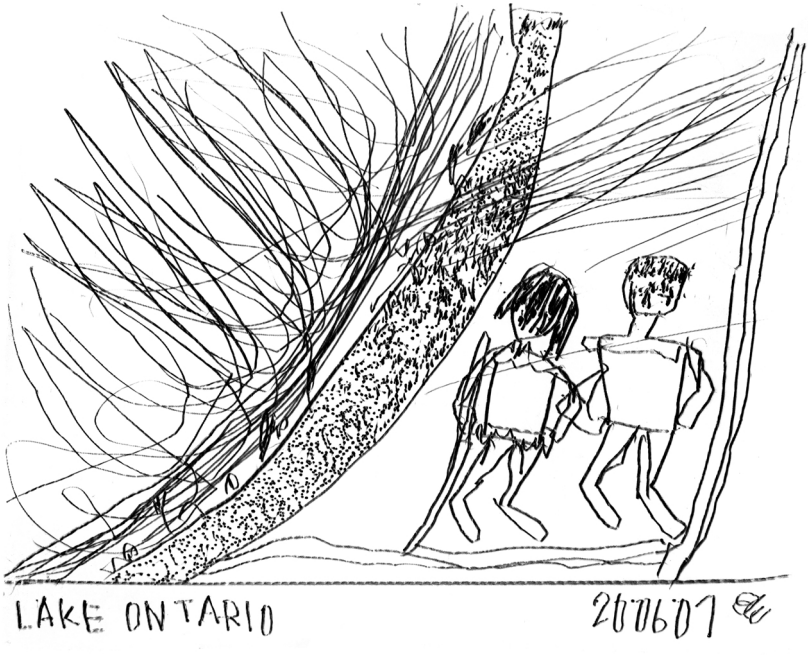


Figure 4. EW (signed in bottom right corner) and her husband walking alongside Lake Ontario, 20-06-2007

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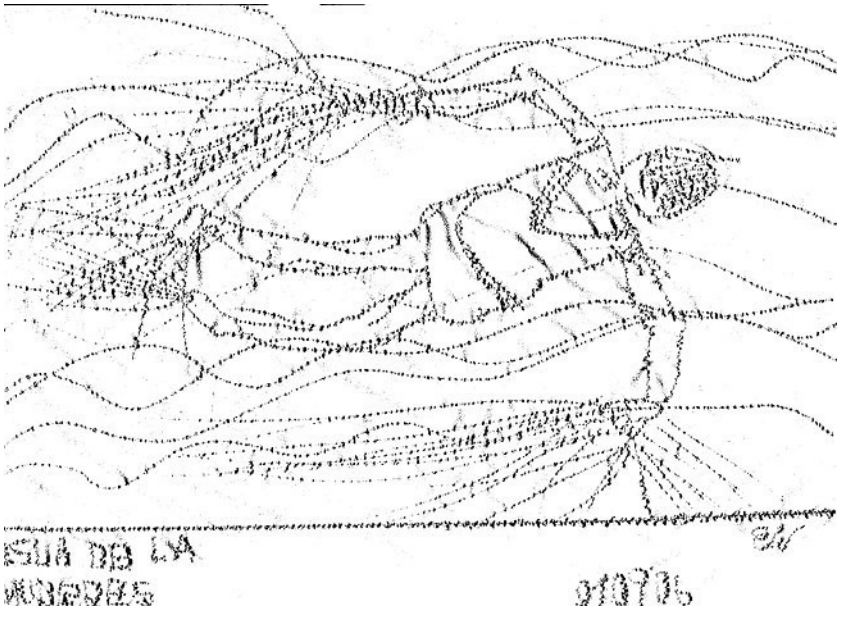


Figure 5. EW: Swimming. Isla de la Mujeres, 01.09.06. From Kennedy (2008) with permission

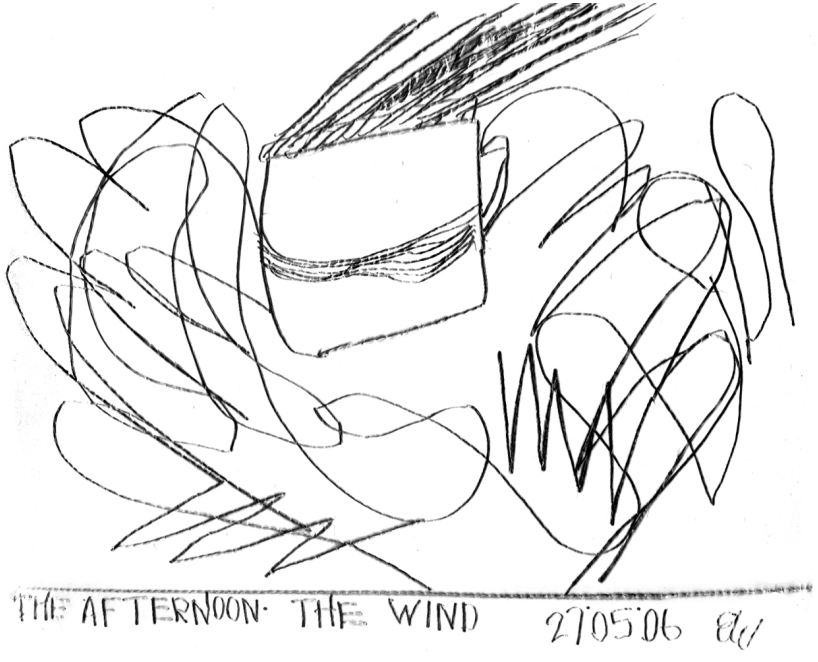


Figure 6. "The afternoon. The wind." by EW, with meandering line for "thoughts." From Kennedy (2009) with permission

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EW, a totally blind adult from Japan, now living in Germany, was born 1972 with retinal blastomas, and became totally blind before 18m old following surgery (Kennedy, 2008). In 2003 she met Elke Zollitsch, an elementary school teacher (a visionary one, surely). EW (April 30, 2007) wrote: "[An] association invited us both [to] Berlin as guest speakers. We kept in touch afterwards and since we both live in Bavaria (about 4 hours' train and car ride between us), we have met up every now and then." Zollitsch had taught a few blind children and noticed their strong interest in drawing (Zollitsch, 2003). She encouraged EW to draw.

In 2006 EW took a sketchpad to Mexico on a vacation. In her drawings, a glass or a person swimming are drawn in a realistic manner in which lines stand for surface edges, and the shapes are those of objects. However, her drawing of a tall slim tequila glass has dense wavy horizontal lines cutting across the sides of the glass. This shows, she said, the effect of the tequila! Another drawing has an irregular closed form in its centre and dense zigzags around it, some so very firm and dense that the individual zigs and zags are indistinguishable. The closed form shows a hot pepper, with zigs and zags for its fiery taste. In another Mexico drawing, a cone of lines, starting in a lower left corner shoots up to fill the top of the page, and stands for the sound of a mariachi band's trumpet. The sketch shows nothing but the sounds of the instruments.

EW invented the devices in her drawings on her own initiative. Zollitsch's influence is positive but not directive, EW said: "She does not give much opinions [sic] as to how I can improve my drawing, or what she does not like about it. She has never told or taught me how to draw … she gives no instructions … it was my idea to draw tequila, javanero [sic] pepper, swimming in the cave etc… I did some sketches of the things that struck me" (EW, April 30, 2007).

7. Thoughts

Sounds and streams are physical matters. Fiery tastes and woozy effects from tequila are to do with a different ontology, the living and their senses. EW's referents are on occasion to do with matter, and on occasion to do with its effects on life – perceptual impressions. The impressions are an experience of a physical object, and so linked directly to matter. Taking aim at mental states, EW distanced her sketches even from the senses. She drew thoughts (Kennedy, 2009). In "The afternoon. The wind" EW drew a coffee cup in profile, with wavy horizontal lines showing the level of the coffee in the cup (Figure 6). From the brim of the cup, oblique straight lines stretch to the right. As if blown by the wind, EW said, the obliques show the heat and steam coming to her hand. EW said she was sitting on her balcony drinking coffee and thinking about her problems. Zigzags in the picture show she was heaving sighs. Around the cup is

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a long meandering thin line, criss-crossing itself. EW described the meandering line as showing her thoughts.

She stated, "I was thinking a lot. Not a cheery thought. The wavy lines are my meandering thoughts." They are an "endless wave of stream of thought that leads to nowhere. The zigzags are my sighing. Quite heavy ones, every now and then" (Kennedy, 1993).

In sighs, our shoulders often rise and fall, so zigzags could be action lines, first evident in art around 1810 (Kennedy, 1993). Little more than a century old, lines for mental states are newcomers in art history (McCloud, 2000; Cohn, 2013) e.g. anger shown by puffs of steam coming from a character's head is not used before the latter half of the 1800s. The last few generations of artists created these and like emotion expressions.

Quite different from an asterisk, lines for cognition are not entirely conventional. They share properties with their referent. In EW's sketch, thoughts wander in space, offering features of thoughts meandering in time (Gibbs, 2006; Lakoff & Johnson, 1980). 'Meandering' in space fits thinking haplessly, wondering without reaching a resolution. The lines are a metaphor for thoughts, not an arbitrary code. They are not based on a bridging trope (such as a "torrent" of thoughts). EW described the shape of the lines and the nature of her thoughts with similar terms.

Common features allow EW's curving lines to show thought reaching out and then turning back to its origin, turning in on itself, much as lines cut across each other. Curving, abruptly changing direction, doubling-back, crisscrossing lines are apt for troubled thought struggling to find answers.

8. Atmospheres and impressions

EW began using lines for purposes other than objects, she reports, after she had drawn some flowers, but then wanted to show there was something special and distinctive about the scene. She added a few lines around the flowers. In an e-mail of 7 February 2009 EW wrote (Kennedy, 2009):

"I began by drawing concrete objects, animals and people from my childhood memories, such as my pet rabbits…. The idea of bringing other elements such as sounds, smell, impressions, feelings, atmosphere etc. gradually came to my mind. … Another new method I started experimenting with at that time is to take a particular scene or part of a day and try to draw the overall impression of that scene or part into a picture. The coffee cup picture was one of those."

In an e-mail of 9 February 2009 she wrote:

"What led to bringing intangible elements like sounds, smell, feeling etc. … As I was experimenting with my drawings, the idea of utilizing other supporting

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elements such as smell, sounds, feeling etc. gradually developed in my head. … For instance, I discovered I could probably represent the particular tulips I have touched … by first drawing the flowers themselves, and then adding the things that made up … those particular moments I was experiencing the tulips, such as the soft breeze blowing in the garden, birds chirping in the distance, occasional traffic noise, the scent of grass, the warmth of the sun etc. And so it has developed further. … The reason for that, I guess, is the urge to draw, and to record certain impressions in a multisensory way. … For example, I have just returned from a pleasant walk and am feeling well, healthy and creative. And want to draw. Nothing particular about that walk occurs to me to draw, but I want to have the impression from that pleasant walk recorded. So I try to put together different factors of that walk into a picture, such as crystal clear air, the feeling of soft snow under my feet, some children I met on the way, trees I have walked past etc. … Bringing not touchable elements into the pictures and drawing the overall impression are similar to each other."

9. Good and bad

Broadening the ontological scope of tactile drawings, two EW drawings deal with values (Kennedy, 2013). They portray specific physical sites, one a forest and the other a memorial. The pictures are about good and evil.

The forest drawing EW entitled *Magic of the Southwest*. It was made in 2008 during a trip to Australia. Vertical lines in the centre of the picture depict trunks of trees. Tangles of lines atop the verticals show the forest canopy. In the lower area of the picture, light undulating lines fill a space between two parallel lines, modestly curved, concave downwards. EW said the forest had really tall trees, and the forest offered a spiritual experience, a feeling of being dizzy and light headed, of "being enchanted…a bit out of reality.…[you are] taken to another place." EW commented "the whole thing was so mesmerizing and so overwhelming I could not help dropping my voice to a whisper not to disturb anything in this sanctuary." This sketch uses metalepsis (Vicari, 1993), metaphor based on a metaphor. Lightness of line means light-headed, light-headed means enchanted, and the enchantment reveals a sanctuary.

EW's memorial drawing is of the Holocaust Memorial in central Berlin. Her picture shows a person, one hand up near the face, standing in a rectangular grid. The sun, shown by a small circle top right, sends rays towards the person. EW described the person in the picture as looking and trying to grasp the truth. The warm sunshine is "a brutal contrast to the weighty and tragic history this monument indicates." The memorial is made of massive rectangular concrete blocks.

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In EW's picture the grid is at 45 degrees to the base of the picture. The diagonal is realistic but also a "marked" property, singling out an unusual orientation to convey a message. She noted, "the plastic sheet [is] deliberately tilted on the table. With this I wanted to express how wrong (crooked) things seem to have gone … how scary it can get, when things get built up on the already biased basis and how lopsided our knowledge can be." A metalepsis, diagonal means tilted, tilted means improper, and improper means evil. The topic is immorality, an unspeakable immorality.

The sanctuary and Memorial metalepses are sophisticated and need explanations. Likewise, an editorial cartoon following an election might show a car driving over a cliff. The driver might be a PM who lost an election that needn't have been called. Awareness of the times connects a driver and the PM to the political loss.

10. Aida and esthetics

EW drew a picture of Aida (Kennedy, 2014a,b) sacrificing herself by joining her lover who is condemned to be entombed. This is the end of an opera, an esthetic event. In the sketch, within the jagged rocks of a closed cave, depicted by angular lines, Aida stands as if she was the centre of a fountain. Lines spread and curve from Aida like thin streams of water shooting up, spreading and falling back to earth. They cross each other so their pattern is flexible, not geometrically repetitive, so each has its own unique shape within an overall scheme. Their referent is "glory" radiating from Aida. The scene is the culmination of the opera, the key event that brings the train of events to their end, fulfilling the arc of the story.

A twist in a story, an esthetic event, Aida's self-sacrifice completes the opera much as a final phrase completes a melody, and a touch of colour balances a composition. In this picture, EW has turned towards the arts – expressly "the poetic issues of …techniques in theatre" (Crisafulli, 2013, p. 18). Art has its own ontology (Cramerotti, 2009; Kubovy, 2020). Matter, sensory events, thought and morality are not the same as fiction. EW's topic is the high point of a drama, a testament to love in the face of death. In the finale, Aida blazes with glory, EW comments in this picture.

Straight lines radiating from the head of a saint are a cliché for glory. In EW's conception, glory is curved, and like a fountain. Lines arc upwards and then downwards, inverted U shapes. Lines rising from Aida and then falling may mean positive and then negative, for Aida is courageous, but death will ensue. V-shaped lines might have been more strident, lesser arcs less emphatic. EW's fountain adds to her novel use of shapes.

If her up and down lines are positive and then negative, EW's "Aida" uses symbolic shapes. She adds atmospheric lines as swirls, webs and fountains around the objects. They are meant to be expressive, her comments indicate. EA used

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dashed ground under a wheel, a pathetic fallacy showing jerky motion. In contrast, in EW's "Aida," the fountain is entirely imaginary, not a part of nature, not a waterfall curving in sympathy with a character in a story. Just as up and down lines tell us about glory, thin lines help EW reveal a sanctuary. Thin could mean hushed. Presumably every part of a familiar shape can be doctored in the style of MT cars and EA wheels, and every aspect of line shape can be used atmospherically in EW fashion. The result? Vast scope. Tools for expression, lines can be curved, straight, angular, dense, sparse, thin, thick, independent, grouped, crisscrossing, closed, open, outside, inside…etc. The set is infinite since there are an indeterminate number of 1D, 2D and 3D shapes. Just so, objects can undergo an infinite number of distortions. Parts can be enlarged, shrunk, bent, straightened, omitted or substituted (as in diminishing hair and adding horns). Plus, familiar personalities can be shown as stock figures, Madonna as a pantomime Dame for example. And vice versa!

The wealth of metaphoric pictures is a challenge to science. Can modern theories of perception help? Ecological optics holds that science must begin by setting out guiding limits for *light patterns* (Gibson, 1979; Kennedy, 1974; Kubovy, 1986; Turvey & Fonseca, 2009; Cabe, 2012, 2019), unlike early 20th Century Gestalt perception theory (Wertheimer, 1922/1938), which rested on a theory of electrical fields *inside the brain.* Science needs to know when accurate information is present in the optic array outside the brain. Absent a theory of true information one must perforce conclude, "there can be no illusions" (Rogers, 2017, p. 154), a reductio ad absurdem.

Optic information is that which specifies the source of the light. In the natural world, giraffe patterns in light specify giraffes in the terrain. If perception misuses the objective information, the result is an illusion. Set no limits on arrays and specification is not possible. If the meaning of a message is specified we can judge whether the audience understood. Metaphors can violate the default meanings of literal language, e.g. they can insert stock characters like Pinocchio, Robin Hood and Batman where they do not belong. Tinker Bell and Marilyn Monroe appear – and are readily understood – in opinion-page pictures. Thor's hammer and Dr. Who's sonic screwdriver are available. Likewise, the Pyramids, the Great Wall, Niagara Falls and desert islands are anomalous settings for real characters, premiers and the like.

Besides useful settings and clichéd figures like Napoleon, in atmospheric sketches like EW's, 2D symbolic shapes can rely on well-defined opposites. For example, in comparison to diagonal, erect is positive. In comparison to angular, curved is positive. Asked to pair circle and square with soft and hard, speakers of many languages, including English, Slovene and Japanese, pair circle with soft and positive, and square with hard and negative (Gabias & Kennedy, 1984; Kennedy et al., 2003; Liu & Kennedy, 1994, 1997). Circles are smooth and squares are

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angular. Smoother things afford more comfort, physically. Metaphorically, warm is paired with circle, cold with square. Good pairs with circle, evil with square. In this spirit, Aida's concave-downwards arcs are metaphorically soft, warm and lively, and her jagged rocks hard, cold and deadly.

In sum, EW invents metaphoric devices to show material (e.g. wind), sensory events (e.g. the heat of a pepper), mental events (thoughts), moral topics (good and evil) and esthetics (a finale, a glorious one). She aims to create atmospheres, and uses line thickness, density, length and curved and angular shape symbolically. She did all this on her own initiative. EW's homeland is Japan, her graduate education country was Canada, and her adopted country is Germany. I commend her to all three.

11. Surfaces, expression and intellect

Metaphor is defined with reference to language, so "metaphoric picture" is a metaphor. However, like many metaphors, it can be made precise, and turned into a testable theory of psychological and neurological mechanisms to do with outline, expression and familiarity.

A sawtooth line resembles the peaks of an Alpine mountain range, edges of surfaces. It might also express rough and smooth, as in sharp tops and rounded valleys. It may be a playful exaggeration, increasing slopes and widening valleys around Mont Blanc. Surfaces, expressions and knowledge are all in play here.

In matters of surfaces, lines in Figure 1 copy the length and orientation of limbs, suggesting the middles of limbs. Leymarie and Aparajeya (2017) describe this as "medialness, an extension of the abstract mathematical representation known as 'medial axis' or 'Voronoi graphs'… a core feature used by humans in perceiving shapes in static or dynamic scenarios" (p. 169). Consider spots along the left and right borders of a limb. Take a line down the middle of the spots, between the borders, and the result is a medial. It depicts the centre of the limb. Put spots on one border of the limb, and draw a line through these, and the result is a medial depicting the occluding border. "Medialness" can account for stick figures representing limbs and for the occluding edges of objects such as cars and bodies. The task of lines related to "medials" is to copy shapes quite tersely (Gibson, 1979; Cowie et al., 1989). Medials are processed by early-perception machinery.

The limbs in Figure 1 are skinny, but they are not showing skinny arms and legs. Not intended to be false, they are part and parcel of making the drawing. The skinniness suggests "medial" lines. The skinniness is unrealistic, but not meant to be "false." In contrast, MT's apt sketches of cars are deliberately false.

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Medial theory has limits. It has no account of the weaknesses of outline. More needs to be said because shadows have borders, as do highlights and colour patches, none of which can be depicted by lines, in that regions enclosed by lines do not become dark, light or coloured (Casati & Cavanagh, 2019; Kennedy, 1993). Medial theory's strength is that early in visual and tactile processing, lines could be reduced to medials, and in further processing these could depict edges. This is the core of literal depiction, the kind that copies shapes of the world, both "true" shapes and "perspective" shapes (Kubovy, 1986; Juricevic & Kennedy, 2006).

Alas, medial theory plays no role in lines making metaphoric shapes, such as MT's unusual quadrilaterals for moving cars. The shapes are long in the direction of motion – horizontal. Vertical exaggeration would not be apt. The reason may be cognitive, a matter of interpretation. The horizontal extension specifies movement, forward. The horizontal could also be used for other topics, such as reaching or tension. Put abstractly: A feature of Figure 1 requires two accounts since it has a reason for being anomalous. An aspect of the figure (extension) is relevant to another factor (temporal – change in location across time). A specific property is represented (the change is motion, specifically forward motion. Horizontal elongation relevant to motion forward is metonomy, a part standing for a whole.

The elongation metaphor is not a conventional token like an exclamation mark above a character's head to express surprise. Ends of objects literally expand in angular subtense as an object approaches the observer, so large size marking a front end in Figure 1 has literal support. The horizontal is related to movement sideways since objects flow in that dimension. Speedy heroes (like the Flash) use horizontal streaks, suggesting this trope has perceptual roots (Juricevic & Horvath, 2016).

Some EA devices such as (((O))) depicting motion in static pictures may be sensory, Stefano Mastandrea of Roma Tre pointed out to me (Mastandrea & Kennedy, 2018). Brain areas triggered by visual information for movement are also triggered by some comic-page devices for motion (Kim & Blake, 2007). Kourtzi and Kanwisher (2000) reported strong fMRI signals from the motion-sensitive region V5/Medial Temporal and Medial Superior Temporal cortex when confronted with 2D pictures indicating motion, compared to pictures specifying static objects. (Cohn, 2013, p. 108, offers doubts about the visual-brain hypothesis for motion lines.) It may be that EW's arcs for glory are expressive in a sensory mode, perhaps appearing soft and to do with sensing emotion in others (Bhasin et al., 2010), as well as symbolic, as in standing for the good. A fountain affords water to a thirsty spirit, and thereby EW's fountain of glory suggests positive affordances, it could be.

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MT drew wheels-inside-a-chassis to show a car is stopped. EA's ground mimicked the trajectory of wobbly motion. Cognitive metaphors, they rely on knowing the car or ground shape being violated – in this case, where wheels properly belong (outside, unlike say MagLev magnets, which could be inside, a nerdy fact), and the fact that the ground normally stays level. In short, intellectual processing of pictorial metaphors, using general knowledge of objects such as fountains, is required.

Some outline and expression processing could be tricky and slow, and some uses of general knowledge obvious and very fast, but some outline processing must precede any effects of familiarity, since the line shape is what triggers familiarity. Expression could be analyzed early or late, since it can be blatant, like EW's zigzags for a hot taste, or subtle, like her use of diagonals.

Expressive patterns can suggest weight, density, momentum, tension, direction, strength and softness (Arnheim, 1954). Thereby, positive and negative factors may come into play (Liu & Kennedy, 1994, 1997).

In short, metaphoric pictures need psychological theories about surfaces, expressions and general knowledge.

12. Metaphors, images and perception

A popular account holds that metaphors belong to families loyal to a central image, from which all blessings flow. Ritchie (2003) put this idea, owed to Lakoff and Johnson (1980), briefly and clearly: "most concepts are fundamentally metaphorical, and most verbal metaphors are expressions of underlying conceptual metaphors" (p. 88). In this account, metaphor often "activates partial simulations of the perceptions associated with the vehicle, which then becomes part of the meaning of the topic" (Ritchie, p. 89). Do "simulations of perception" explain much of metaphor? Indeed, images – simulations of perception – can trigger abstract ideas. "Infinity" can be triggered by thinking of mirror images of mirror images of mirror images, etc.. And vice versa. But the image fits many terms, and any given term is more general than any image. They are not a 1 to 1 fit. That is simply how examples work.

Metaphors are sometimes kin to pictures. For example, "POTUS is out of his depth" is picturable. However, explaining groups of metaphors by reference to perception buys us little. For one, the reference is unable to explain pure abstractions. Erring on the side of safety, engineers quip, "2 is the square root of 3 for infinitely large values of 3." This violates a definition, not an image.

In the Elgin Museum, Scotland, is a bust with three noses (Figure 7). Three faces, left, middle and right, share four eyes. Unsettlingly, eyes alternate in belonging to one or another face. For a time, images of this kind (Andello, 1542) were common but they fell heavily out of favour.

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Figure 7. Bust suggesting The Trinity. Elgin Museum, Scotland. Photograph by the author

They emphasize the paradox "three in one." If the gloss of the metaphor as an image of the Trinity is clumsy, gauche, a faux pas, as I judge, verbal and pictorial metaphors seem to have different criteria for aptness.

Alas for image theory, images do not suit understatement, tautology and irony. "Jim was a bit lucky" understates massive good fortune in a lottery. "Most people left, because Alice was being Alice" is a tautology. Caricatures fail to be recognized when features are reversed or understated, and they fail to be caricatures, or a trope at all, when, like a tautology, they simply portray Alice.

When pictures are germane to images, as in hyperbole, using one to explain the other is walking in place, getting us no further ahead. Explaining an image by means of a metaphor accepts that a sister is to a brother as a brother is to sister. To account for both of the kids, the story needs an independent character – the mum or dad. Parental supervision by the intellect supports pictorial metaphors. Consider: A Premier can disguise himself as Peter Pan but a mirror in the picture can show he is really Captain Hook. Alternatively, he wears Potter glasses but has Voldemort's face. General knowledge makes these pictures work by settling on the relevant feature.

The fatal omission in simulated-perception theory is comprehension. Because we understand poetry we can produce an image, and vice versa. Comprehension has horsepower because it indicates what feature of the comment (in the poem or the picture) belongs to the topic, via a secondary meaning of the comment. Why

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is Hook the relevant image? Comprehension finds the reason. It picks out the key property.

Most devastating of all, verbal glosses on pictorial metaphors often fail utterly. Highly effective pictorial metaphors do not translate into descriptions of the shape in the picture. "The car is shorter" does not mean it is stationary. "The wheel had V-shaped spokes" does not mean it was in jerky motion. "Its spokes were dashed" fails to convey speed. "Swirling lines surround my coffee cup" has no clear connection to thinking. The picture does not justify the words. An infinite number of sentences can fit the picture, none offering the metaphor.

It might be objected that the term *metaphor* is being used here as a cover term for every interpretation that is not "literal". A fair comment, let us admit, and the justification is *metaphor* is commonly used, as here, as a handy synonym for "trope," the general term for figurative communication.

Another caution is that metaphorical statements are not always literally false. Not all pictorial cases depart from realism. In language, it is literally true that "he is not the sharpest knife in the drawer." Likewise, metaphoric pictures can be as realistic as a photo, and have a requisite second meaning. The well-known Punch image "Dropping the pilot" by Sir John Tenniel (1890) shows the young, bombastic, self-aggrandising Kaiser Wilhelm II (1859–1941), in the second year of his reign, leaning over a ship's rails, keeping an eye on the wily elder statesman Bismarck, who is descending into a launch, regretfully leaving control of the ship of state in the hands of an inexperienced leader flawed at the core – erratic, a militarist and egotistical. Big trouble ahead! Rocks! WW1! Quite precise in style, the Tenniel drawing might well have been modelled on a photograph. It is a metaphor because it carries a secondary meaning, in this case for the state. Being unrealistic is one way an image can be metaphoric, but realism is also open to secondary meanings.

An important puzzle for theory of metaphoric pictures is the meaning of "stands for." What kind of a thing is a picture standing for a scene? It is obvious that an outline drawing of a ship stands for a ship. But in what way? In definitions offered by Charles Sanders Peirce (1839–1914), it is an index and also an icon (Peirce, 1977; Sonesson, 1994). An object is an index in a context. A finger points to something and is an index only if posed, accompanied by an intention, and there is an intended referent. A line depicts an edge in the context of an outline drawing, a graphic created by a person. The index relation is unidirectional. An edge does not depict a line, just as a referent does not point to a finger.

"Peirce speaks of "native resemblance', or says that a sign is iconic when it can represent an object principally by its similarity" (Group μ, 1994, p. 21). As an

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icon, the line resembles an edge. However, "resemblance" and "similarity" are such rough-and-ready vague terms, it is best to describe what is done by elements in the picture. Lines depict edges. Adding that the line resembles an edge suggests perception is at work but does not explain why. It does not contend, for example, that both the line and the edge trigger a shape function such as $y = ax + b$. Further, lines support percepts of surfaces. Lines do not resemble surfaces.

An outline drawing is a kind of metonomy. In metonymy, a fleet can be treated as "Sails ahoy!" – a part entails the whole. Lines stand for edges but a *whole surface* is delimited by the edge, a metonymy. Further, the scene is part of a *whole event*, another metonymy, when Tenniel draws Bismarck stepping downwards, metonymic for his departure. Still further, the departure is metonymic for leaving *the post of Chancellor*. The metalepsis is a triple metonymy – edge for surface, surface as part of event, event metaphorically as part of a political change.

Rhetoric captures aspects of pictures. But rhetoric has no terms for depiction per se, neither for lines painted on surfaces, nor for edges, surfaces, slant and depth in pictured scenes. A picture is not a term in the list of rhetorical devices. The primary meanings of a picture's elements are perceptual. Picture perception offers primary effects, default ones. Metaphors – tropes – build secondary meanings on primary ones.

13. Conclusion

All representational media allow metaphor, and when it comes to pictures, metaphors are invented by practitioners with not much practice or tutoring. MT's, EA's and EW's pictures, like those of many other blind people (Kennedy, 1993), tell us about prowess with literal and metaphoric meaning and expression (Kennedy, 1982). In the drawings, shapes of familiar objects have many metaphoric uses, atmospheric lines likewise. Contrasts with default principles of surfaces, edges and outline are used in visual and tactile metaphoric pictures.

Pictures like the sketches here may be drawn by many blind children and adults in the near future. Throughout the world, schools and museums have begun offering tactile pictures. The British Museum, for example, had raised-line pictures in a Braille catalogue of its ice-age art exhibition (Cook, 2013). The Met NY (Hayhoe, 2017), Art Beyond Sight, NY, and major galleries such as Stockholm's, Berlin's, the Louvre, the Tate, the Philadelphia and the Whitney (Axel & Levent, 2003) have similar initiatives. Accordingly, figures in this chapter may someday find a home in a nation's gallery.

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Metaphor production and metaphor interpretation

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Metaphor production and interpretation are intricately connected: the former has the latter as its ostensive target; however, interpretation processes can trigger new metaphor formulations which were unforeseen by the original speaker and would have to count as new productions. This paper looks at corpus- and survey-based evidence of innovative interpretative metaphor use that changes the default meanings of established figurative constructions. Specifically, we look at interpretation-induced changes in the meaning of corporeal metaphors, on the basis of a (1) corpus of British political discourse and (2) a questionnaire survey of more than 1000 respondents from 31 linguistic backgrounds in 10 countries.

The corpus-based evidence presented in the first part consists of metaphor-production data that show how situational variation in metaphor use can over time create a semantic-pragmatic drift that changes the dominant meaning of a conventional metaphor expression, thus illustrating diachronic variation. The questionnaire survey, which forms the material for the second part reveals four distinct models for BODY-focused readings (i.e. NATION AS GEOBODY, AS HIERARCHICAL FUNCTIONAL WHOLE, AS PART OF SPEAKER'S BODY, AS PART OF LARGER BODY), plus further PERSON-focused readings. These data show synchronic variation.

By highlighting significant variation, both data sets put in question the standard theory model of 'automatic' metaphor processing and extension. Instead, they indicate a strong production element in metaphor interpretation – and of interpretive aspects in metaphor production.

Keywords: creativity, corpus, discourse history, interpretation, metaphor production, metaphor reception, nation as body/person, questionnaire survey, variation

1. Introduction

When and where is a metaphor created: in the production when a speaker utters it, or in the reception when it is understood/interpreted by one (or several) recipient(s)? Apart from its 'chicken-or-egg' version, the question is not as trivial

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as it may seem. Is the speaker's intended meaning the only meaning that matters for the receiver as regards figurative status, (target-)reference and contextually relevant connotations? Does the receiver's interpretation of the metaphor count as a mis- or non-understanding if it does *not* match exactly the speaker's intended meaning? Or can it constitute a new figurative meaning, which may even be endorsed by the speaker subsequently? If yes, do we not need to view a metaphor's meaning as variable or flexible, perhaps even in its production, i.e. in the sense of the speaker allowing for varying interpretations?

Two main types of answers have been proposed to tackle such questions. One type consists of more or less nuanced differentiations between "novel"/"creative", "conventional", "dead" and "sleeping" metaphors, the latter with various degrees of "revivability" (Goatly, 1997; Lakoff, 1987; Müller, 2008). Novel metaphors are thus regarded as a special class of figurative expressions that require a "deliberate" cognitive and communicative effort on the part of the speaker and a corresponding interpretative effort on the part of the hearer/reader (Weinreich 1983; Steen, 2008, 2011; Sperber & Wilson, 1995, pp. 235–237; Tendahl & Gibbs 2008), which entails a complex "conceptual integration" process (Fauconnier & Turner 2002) and further pragmatic exploitation by way of irony and sarcasm (Musolff 2017a). Conventional and fully lexicalized metaphors, on the other hand, are thought to be "automatically" produced and understood (Lakoff, 1993, 2008) and as having reached (or nearly reached) the end of their conceptual "career" or "evolution" (Bowdle & Gentner 2005; Croft & Cruse 2004, pp. 204–206).

A second main avenue to deal with the possibility of a production-reception mismatch has been to allow for the semantic variation of metaphors as a context- and culture-specific phenomenon (Barnden, 2009; Kövecses, 2005, 2006, 2009; Idström & Piirainen, 2012; Musolff, MacArthur & Pagani, 2014). Recent Foreign Language Acquisition and Language Contact research has provided empirical evidence that the 'creative misunderstanding' of metaphors by learners/users is a widespread practice and can be used as a pedagogic tool rather than as a mere "error" phenomenon (Littlemore, 2001, 2003; Littlemore et al., 2011; Nacey 2013; Philip, 2010; Piquer-Píriz, 2010; Trim, 2012).

This chapter explores innovative metaphor use in both production and interpretation on the basis of corpus- and survey-data based evidence. Specifically, we look at interpretation-induced changes in the meaning of the CENTRE-AS-HEART and NATION-AS-BODY metaphors,[1] using data from (a) a corpus of

1. SMALL CAPITALS here and further in the text indicate conceptual categories (source and target domains, single concepts); *italics* indicate types of formulations (or titles of newspapers, books etc.).

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British figurative discourse on European politics; and (b) a questionnaire survey of more than 1200 students from 31 linguistic backgrounds. Both data sets indicate a strong production element in elicited metaphor (re-)interpretation, which goes beyond mere semantic extension of conventional metaphors. Rather, the production element in metaphor (re-)interpretation accounts for considerable variation and, in some cases, creation of new metaphorical concepts. After surveying and analysing the evidence, we will discuss its significance for a model of the relationship of production and reception sides in figurative language use.

2. Creative recycling of a metaphorical slogan: Britain at the heart of Europe

The public debate surrounding the referendum on the United Kingdom's exit ("Brexit") from the European Union (EU) has seen the revival of a metaphorical slogan that has already been declared 'dead' several times, i.e. the contention that Britain is or should (not) be *at the heart of Europe*. Public voices opposing a "hard Brexit" have used it to suggest that the "UK has an 'ardent wish' to remain at [the] heart of Europe" (*The Independent,* 27/06/2017, reporting on a speech by the Chancellor of the Exchequer, Philip Hammond), whereas enthusiastic pro-Brexit voices such as the *Daily Telegraph's* editor J. Warner have employed the metaphor to paint the picture of "the heart of the European project" being full of "deep contempt […] for the collective will and concerns of the people" (*The Daily Telegraph,* 23/08/2016).

These are just two instances of 248 texts documenting the discourse-historical development of the slogan *Britain at the heart of Europe* as part of a bilingual English-German "EUROMETA" corpus of figurative press texts on EU-politics.[2] The *heart of Europe* sub-sample yields 9–10 texts per year on average, with peak occurrences (>20) in 1991, 1995, 1999 and 2016 and this sample allows a good overview over the conceptual variation and pragmatic exploitation of the metaphoric slogan

2. Which goes back to 1989 and reaches until September 2017. Overall, the corpus is currently 612.000 words large and has more than 2500 separate text entries (Musolff 2004a). The British sample is over 390.000 words large, with the HEART-BODY-HEALTH source domain accounting for texts amounting to 113.191 words, drawn from a broad spectrum of newspapers and magazines, specifically, *Daily Express, Daily Mail, Eastern Daily Press, Financial Times, New Statesman (previously: New Statesman & Society), The Daily Telegraph, The Economist, The Guardian/Observer, The Independent, The Northern Echo, The Scotsman, The Spectator, The Sun, The Sunday Times, The Times.*

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as well as of its 'discursive drift' from an optimistic promise towards its ("euro"-) sceptic denunciation as a pointless, doomed project (Musolff 2004b, 2013).

The notion of 'discursive drift' is introduced here as a counterpart to "semantic drift" (Croft & Cruse, 2004, p. 205), to capture changes in the stances taken by users of conceptual metaphors that become visible over shorter or longer time frames. Some conceptual metaphors can be traced back over hundreds and thousands of years, such as the LOVE-WAR and ILLNESS-WAR analogies (Sontag, 1978; Trim, 2011), the ontological-theological CHAIN-OF-BEING concept (Kövecses, 2002, pp. 124–126; Lakoff & Turner, 1989, pp. 166–172; Lovejoy 1936), or the politico-sociological NATION-AS-BODY/PERSON metaphor, which had been lexicalised in English as *body politic* (Charbonnel, 2010; Chilton & Lakoff 1995; de Baecque, 1997; Guldin, 2000; Kantorowicz, 1997; Musolff 2010). Shorter discourse histories can be observed over several years or decades, as in the *heart of Europe* case.

It only became a slogan through a speech given by the then Conservative Prime Minister, John Major, in Bonn, Germany, in March 1991. Major promised, "Our government will work at the very heart of Europe with its partners in forging an integrated European community" (*The Guardian*, 12/03/1991). Here, the phrase, *at the heart*, was employed by the speaker in the conventional, only weakly metaphorical sense of 'heart-as-centre' (*Shorter Oxford English Dictionary* 2002, vol. 1, p. 1213 and *Roget's International Thesaurus,* 1996, p. 143). In combination with the qualifier "of Europe" (with *Europe* as a metonymy for "European Community" (EC), as the "European Union" was then still called), the phrase designated a policy promise that would entail a break with the distanced, if not hostile stance towards the EC taken by his predecessor, M. Thatcher (Major, 2000, pp. 268–269).

Major's message was understood and largely accepted in this sense across the whole media spectrum at the time. The magazine, *The Economist,* even took the new policy for granted: "Of course Britain should be at the heart of Europe whenever it possibly can, for that is where the decisions that affect many British interests are being taken" (*The Economist,* 23/11/1991).

Later that year, however, after negotiations for a new EU Treaty led to his government's "opt-out" from the planned common EU-currency, Major's parliamentary opponents questioned his closeness to *Europe's heart* by contrasting his speech with the negotiation results. The Labour Party leader, N. Kinnock, asked him how he could "claim to be at the heart of Europe when, because of his actions, our country is not even part of the key decisions [about future EC policies]" (Hansard 11/12/1991), and the leader of the Liberal Democrats, P. Ashdown, alleged that Major had in fact "condemned" the UK "to be semi-detached from [the heart of Europe]" (ibid.). The slogan's metarepresented meaning in such criticisms clearly hinged on the HEART-AS-CENTRE interpretation.

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During the following years, Major's statement was quoted time and again as a point of reference for his officially positive stance on Europe, with most commentators tacitly assuming that being *close* to the EU's HEART-AS-CENTRE was both desirable and feasible. But this view changed when, in August 1994, the French and German government parties published proposals for further political EU integration. They envisaged a division of the Union into an "inner core" or "circle" of member states committed to faster socio-economic integration, and several "outer circles" of less committed states, to which Britain belonged. Without negating or contradicting Major's slogan explicitly, the exclusion of Britain from the EU's "inner core" effectively undermined any pretence of it being close to Europe's *heart*. Major rejected the proposals within days, and the pro-EU-leaning *Independent* newspaper pointed out his dilemma of being too close to the centre of EU policy for his own increasingly Eurosceptic party's liking and not sufficiently close enough in the eyes of France and Germany with a pun on the idiom 'out on a limb' (*Brewer's Dictionary of Phrase & Fable* 1999, p. 864): "He wanted Britain to be at the heart of Europe. Yet too often he found himself alone at the end of a limb" (*The Independent,* 08/09/1994).

Shortly afterwards, the *Independent* published an even more drastic verdict: "One British metaphor, at least, has ceased to beat. John Major said in Bonn in March 1991, that he wanted to put Britain 'where we belong, at the very heart of Europe'. […] if Mr Major wanted to be at the heart of Europe, it was, presumably, as a blood clot" (*The Independent,* 11/09/1994). By re-contextualising the quoted slogan through referencing a heart attack (*ceased to beat, blood clot*), the writer resuscitated the corporeal aspects of the HEART source concept in such a way as to present both the object-level referent – the centre of Europe – and the *heart*-metaphor as *dying* entities. This elaborate blend (Fauconnier & Turner 2002, pp. 126–131) of at least one source and several target conceptual inputs yields extra communicative and cognitive effects of irony and evaluation, which make extra comprehension efforts by the reader worthwhile. Semantically, the expression *at the heart* covers two metaphors, or at least two metaphorical source-referents: HEART AS CENTRE and HEART AS ORGAN. They are obviously closely related, with the CENTRE concept being based on a metonymic link to the ORGAN concept. However, the difference is not just semantic. Whereas the CENTRE concept connotes at best a schematic, topographic frame, the organ concept invokes an embodied frame that relates to physical and emotional experiences (Niemeier 2000). Crucially, it fits into narratives around the topics of HEALTH and ILLNESS, which also carry strong evaluative biases, i.e., that health is preferable to illness, that the latter can lead to death, etc. Metaphors as conceptual platforms for such narrative-argumentative constructions can be called *scenarios* (Musolff 2006, 1016, pp. 25–38), which allow speakers to implicate pragmatically specific conclusions.

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Thus, the *heart of Europe* as a *dying organ* or as *being threatened by a blood clot* tells a story about the EU, i.e. its life-story, and it evaluates the UK's role as a supportive or antagonistic participant in that story.

The Independent was not the first to achieve such a 'revitalization' of the HEART-AS-ORGAN metaphor in the slogan: even two years earlier, after the Pound Sterling had been forced by speculators to leave the "European Exchange Rate Mechanism", the *Economist* diagnosed already a "Coronary in Europe's new heart" (26/09/1992). However, after 1994, the 'organic' scenario of the DYING/ ENDANGERED HEART OF EUROPE became more and more attractive as a frame of reference to criticise Major's policies. The *Guardian* (09/02/1995) called his *heart of Europe*-ambition "less than full-blooded", and a former EU official B. Connolly published a book alleging corruption and incompetence in the EU administration under the title, *The Rotten heart of Europe* (Connolly 1995), which was reviewed and advertised across the whole British press, and, predictably became a favourite with EU-sceptics. Further ILLNESS-referencing uses of the metaphor followed, e.g. that Major was "blocking [Europe'] arteries" (former Prime Minister E. Heath, quoted in *The Daily Telegraph*, 21/06/1996), or the explicit conclusion that "if the heart of Europe [was] diseased, there [was] no point at being at the heart of Europe" (former Chancellor N. Lamont, quoted in *The Guardian*, 10/10/1996).

After winning the UK election of 1997, the Labour government under Tony Blair was keen to claim *Britain at the heart of Europe* as an optimistic slogan for themselves (*The Guardian,* 10/06/1997); however, even within his first year the *Guardian* highlighted its quick loss of meaningfulness: "The litany passes from government to government. A Britain at the heart of Europe. We'll hear the chant 1,000 times again this month […]. But hold the stethoscope and listen carefully, for the heart has some curious murmurs. […] [The issues actually discussed by the officialdom of Brussels] bear no relationship to the British "debate", hearts, livers, gall bladders and all" (*The Guardian,* 01/12/1997). The dismissive characterisation on the slogan as a "litany" or "chant" in this example is escalated, as it were, by further exploitation of the medical domain (*stethoscope, heart's murmurs*), that leads up to the contemptuous punch-line of connecting the "heart" debate with a list of 'lower' body-organs, "livers, gall bladders and all".

Denunciations of *the heart of Europe* remained highly popular at further crisis-moments in the EU-UK relationship. When in March 1999, a nepotism scandal in the EU Commission became public and led to their collective resignation, large sections of the British press viewed it in terms of the DYING HEART scenario: "the rotten heart of Europe will never be cleaned out" (*The Sun,* 17/03/1999); "[markets fear] a political vacuum at the heart of Europe" (*The Guardian,* 17/03/1999), "changes in personnel will not be enough to stop the rot at the heart of the EU" (*Daily Mail,* 17/03/1999); "abruptly the heart of Europe got sick"

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(*The Economist,* 18/03/1999); "a hole suddenly opened up at the heart of the European Union" (*The Independent,* 21/03/1999). In the 2000s, during every disagreement between the UK and the whole or parts of the EU on issues such as financial policy or immigration and free-movement policies, the *heart-of Europe* promise kept being denounced by contrasting it with allegedly more relevant, but derogatory body references, e.g. "Tony Blair says he wants Britain to be at the heart of Europe. Well it looks this morning as if Europe is showing us its backside" (*The Sun,* 03/09/2001), or hints at flaws that impeded its proper functioning: a "definitive split at the heart of Europe. (*The Guardian,* 16/12/2003); "the time-bomb at the heart of Europe" (*The Economist,* 15/11/2012); or a *Cracked heart* (with, Germany, rather than Britain "sit[ting] uneasily at the heart of Europe" (*New Statesman,* 14/03/2013).

From 2014 onwards the public debate about a referendum on Britain's EU-membership under the conservative Prime Minister David Cameron became the main thematic context of the slogan's use. Once again, denouncing *the heart of Europe* became a popular pastime among euro-sceptic politicians and journalists, despite a few 'rear-guard' optimistic uses by pro-*heart of Europe* politicians such as Major and Blair (*Daily Express* 11/03/2016, *Northern Echo,* 09/06/2016, *The Independent,* 22/06/2016). When the 2016 referendum yielded a pro-Brexit result, the *heart of Europe* was once more viewed as *dead,* on account of Britain having "plunged a dagger" into it (*The Independent,* 26/06/2016). Some pro-EU leaning voices have still maintained the slogan as a rallying cry (*The Independent,* 15/12/2016; *The Guardian,* 27/06/2016) but only in the pale, formulaic CENTRE sense, without any attempts at using the narrative-argumentative potential of the 'organic' scenario.

Reviewing the slogan's development, we can characterise its central metaphor as a focus of public debate that has been 'kept alive' by repeated reformulations, allusions, and meta-communicative comments and in the process changed its evaluative connotations. Its initial uses and interpretations in 1991 were still based on the conventional HEART-AS-CENTRE meaning, which is fully lexicalised and could be even considered a "dead" or "sleeping" figure of speech. Innovative usage of the metaphorical slogan can be discerned in the sarcastic reinterpretations that revived its latent organismic/corporeal source domain, i.e. that of THE HEART AS A BODY ORGAN THAT CAN FALL ILL AND DIE. It was this scenario of the unhealthy condition of the EU's *heart* or *arteries* (e.g., *blocked, cracked, dead, dirty/smelly, hollowed-out, rotten, sick/ill/diseased,* and characterizations such as *blood clot, flaw, hole, split, time bomb, vacuum at the heart, heart crisis, heart of stone, no heart, time-bomb at the heart, threatened by euro-sclerosis),* together with the juxtaposition of the *heart* with 'low' or 'embarrassing' body parts (*backside, gall bladder, liver*) used by EU-sceptics that challenged and changed

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the neutral-positive default assumption of the *heart*-position being important and desirable (because of its centrality).

If the *heart* as the *organ* of a figurative *body politic* is ill, dysfunctional or irrelevant, the desirability of being *at or close to* it is diminished, if not destroyed. As a further pragmatic effect, we can identify a denunciation effect that functions as "implicational impoliteness" (Culpeper, 2011: 165–167) against a specific politician's or group of politicians' public face. By attacking their quoted or alluded to promise of a *Britain at the heart of Europe*, the targeted speakers were supposedly revealed as being incompetent or hypocritical. These ironical and/or sarcastic uses still presuppose the optimistic usage, if only as the foil against which they must be understood; so in a sense, the optimistic promise version of the slogan has never disappeared completely from the conceptual "scenario" that is evoked by the metaphor. The media in fact reminded their audience from time to time which politician or party allegedly 'owned' the slogan in its optimistic version, but the communicative context was almost always a confrontational one: Politician X (e.g. Major or Blair) was depicted as having announced or promised or believed 'that Britain is/should be at the heart of Europe', only to be criticised for not fulfilling the promise or being ignorant of a changed (*health*) condition of the *heart* etc., which is more or less drastically exposed by the commentator. This 'discursive drift' of the slogan can be discerned in the decline (though not disappearance) of the non-quotative, assertive uses of the optimistic version over the course of 25 years, whilst critical quotations and denunciations of the presupposed optimistic *Britain at the heart of Europe* promise gained in prominence, especially in the run-up to and the aftermath of the 2016 Brexit referendum. In retrospect, it might even be argued that it was precisely the slogan's denunciations by way of the organismically and pejoratively reinterpreted HEART metaphor that prevented it from being forgotten. The promise *to put X at the heart=centre of Y* only lent itself to relatively weak endorsements or criticisms (as the initial reactions to Major's and Blair's uses showed), whereas the introduction of gory physical or medical details about the *heart and arteries* of the EU as *being blocked, dying, rotting* etc. ensured the slogan's continued presence in the public debate.

As the result of surveying this first set of examples, we can identify a strong productive element in the (critical) re-interpretations of the metaphorical slogan of *Britain at the heart of Europe* insofar as they changed the mainly relevant source domain (from CENTRALITY to BODY-HEALTH), as well as the evaluative connotations and default stance from DESIRABLE to UNDESIRABLE and provided a platform for further pragmatic effects (irony and sarcasm). Together, these discourse-historical developments have changed the slogan's dominant reception into that of an "echoic", "metarepresented" utterance (Sperber, 2000; Wilson & Sperber,

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1992: 57–66; 2012, pp. 128–134) that is mainly remembered as a 'once famous' metaphor and thus has, arguably, for many members of the British public a historical association.

Two main lessons can be learnt from this part of the evidence under consideration: i) Whilst the referential target of a metaphorical formulation may stay, roughly speaking, the same, i.e. in our case, the centre (of EU politics or political decision taking) as *the heart of Europe,* its connotations and stance-taking framing power can be 'turned around' or reversed, due to discursive developments that are beyond the control of the initial speaker(s). The changes in the UK's public's dominant attitudes toward the EU were in fact resisted and opposed by the two most prominent 'proposers' of the slogan, Major and Blair; still their own metaphor was quoted, interpreted and reinvented against them repeatedly until it meant the opposite of what they intended. Instead of expressing an optimistic promise, it was used to draw the conclusion that there was no point in being close or engaging with a heart that was diseased, dead, or empty. The reinterpretation was not wrong or absurd – after all, it still referred to the same referent and gave an argument by analogy to outline the cognitive frame – but if a metaphor's conceptual and ideological force is at all to be taken seriously, then its ideological reversal has to be acknowledged. ii) Such a conceptual reversal (and any other variation) in metaphor production is by no means a 'creatio ex nihilo' but, on the contrary, includes the "deliberate" reinterpretation of preceding metaphor uses, in order to underline the proposed conceptual-ideological change. Production and reception/ understanding of a metaphor should therefore not be seen as the opposite ends of a linear, one-way process but rather as complementary aspects of a dialogical, if not 'polylogical' meaning negotiation, which needs to be viewed in its situational and discourse-historical context to be fully evaluated. The following section aims at providing further evidence for this perspective on metaphor production and reception by looking at elicited responses to a metaphor interpretation task.

3. Productive interpretation: New metaphor variants in questionnaire responses

When teaching a course on figurative language for British and international MA students at the University of East Anglia (UK) in 2011, I ran a brief class test to make sure that the recently mentioned phrase *body politic* had been correctly understood by the students. Half of them were Chinese, the other half was made up of British, US-American, European, Kurdish and Arab students. The test

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instruction asked them to explain the meaning of *body politic* with reference to their home nations. Here are a few examples of student responses:

(1) The head of the body represents the Queen of England, as she is in charge of the whole country and she is royalty. The features of the head (eyes, nose, mouth and ears) represent the different official people, such as politicians, the Prime Minister, the Government.

(2) The nation is like the human body, if one part of the body suffers, the whole body suffers from fever […].

(3) Beijing: Heart and Brain, Shanghai: Face (economic center); Hong Kong and Taiwan: Feet; Tianjin: Hands (= army close to Beijing); Shenzhen: Eyes (= the first place open to the world).

(4) Beijing: brain (control country) […]. Hong Kong: face (familiar to everyone); Taiwan: hair (we can live without hair [but to] have hair is more beautiful fashion.

It will come as no surprise that the first two examples were produced by a British and US student respectively and the latter two by Chinese ones; what was unexpected was a perfect 50/50 split in the metaphor structuring between Chinese and non-Chinese responses. Non-Chinese students depicted the nation (state) through functionally and hierarchically motivated analogies between political and socio-economic institutions to the whole and parts of a human body, which reproduced parts of Western conceptual and discursive traditions dating from the Middle Ages and the Renaissance and lexicalised in the phrase *body politic* (see above). On the other hand, all of the Chinese students' responses appeared to be based on a mapping GEOGRAPHICAL SHAPE OF NATION – ANATOMY OF A HUMAN BODY, salient parts of which were selected according to the metonymy PLACE-FOR-POLITICAL/ECONOMIC INSTITUTION/STATUS (e.g. BEIJING – SEAT OF GOVERNMENT; SHANGHAI, SHENZEN, HONG KONG – INTERNATIONALLY RELEVANT ECONOMIC CENTRES; TAIWAN – POLITICALLY SEPARATE ISLAND STATE; TIBET – PROVINCE WITH OUTLAWED INDEPENDENCE MOVEMENT). These metonymies were then associated with functional meanings of prominent body-parts and organs, e.g., *brain* or *heart* as controlling the rest of the body, *face, eyes, arms* as oriented to the outside world, *hair* as non-essential for survival but necessary for *beauty*. These analogies resembled the Western ones mainly with regard to a hierarchical bias, e.g. *head/brains* denoting a top position in the body-political hierarchy. On the other hand, the grounding of these analogies in geography-related metonymies invokes more than just the Western *body politic*-hierarchy but links it with a conceptual framework of the nation's territory as a body whole, for which the term "geobody" has been proposed (Callahan 2009, 2010).

After this first encounter with divergent interpretations, I devised a simple questionnaire-based survey that posed the task to view one's home nation "in

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terms of a human body". With the generous help of colleagues the survey was administered both in further UEA seminars and language-/ communication-related courses at two other British universities and in Higher Education institutions of nine more countries (China, Croatia, France, Germany, Hungary, Israel, Italy, Lithuania, New Zealand, Norway, Poland, Romania, Saudi-Arabia, Spain, The Netherlands, Ukraine and the USA). The survey has so far yielded 1212 questionnaires, which were completed in English by informants from 41 distinct cultural or linguistic backgrounds (for preliminary analyses cf. Musolff 2016, 2017b). The survey was administered at the start of seminars, in order to minimize inadvertent 'priming' effects of model answers and aimed at finding out whether any patterns emerged that could be related – hypothetically – to specific cultural traditions, thus following up the surprise finding of an apparent cultural contrast in the first class test.

As the responses differed in length (from 1–10 sentences), it was necessary to define 'units of interpretation', i.e. each distinct (BODY-)concept application to the NATION-target was counted as one unit. Hence, the number of counted units per cohort was considerably larger than that of filled-in questionnaires (irrelevant ones were discounted); e.g. for the English-L1 sample, collected from British, US-American and New Zealand universities (n = 120), there were 52 different body-related concepts (with 258 tokens) ! In addition, all samples (ranging from 12% to 37% per L1-cohort) included to a varying degree answers that focused on the NATION AS PERSON metaphor, which is so closely related to the NATION-AS-BODY metaphor that they have often been confused or identified with each other (Chilton & Lakoff 1995; Musolff 2010). Thus, the HEART OF POLITICAL INSTITUTION metaphor discussed above has both physiological and personalised connotations: it is conceived of as an organ, but also as the seat of emotions, and many HEART allocations in the survey corpus combined both types of connotations. It was decided to include these personalised responses, which added in the English-L1 sample, for instance, another 20 concepts that dealt with emotions, character traits, gender-allocation (29 tokens). For the overall almost three times larger Chinese sample (*n* = 306, which comprised 90% Mandarin and 10% Cantonese speakers), the figures are: 73 BODY-related concepts (601 tokens) and 60 PERSON-related concepts (289 tokens). The following sections present a selection of the findings, with the aim of providing evidence for conceptual variation as a fundamental characteristic also of metaphor interpretation.

3.1 NATION-AS-BODY interpretations

The bulk of questionnaire responses that were collected after those of the first class exercise showed that there was in fact no 1:1 match between the variation of institution- or geography-based interpretations of the NATION-AS-BODY metaphor and

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specific linguistic and/or cultural groups. British and US students' responses, for instance, included geography-based readings such as,

(5) This is Britain, a vast, churning body of 48 million people, sucking in resources, processing them, and spewing out fumes and ideas. The mouth and nose are Dover and Portsmouth […].

On the other hand, some Chinese students chose to construct institution-based BODY PART analogies that seemed to be typical of the Western *body politic* tradition, e.g.,

(6) The communist party of China is the head of the body. It leads the functions of the whole body system, which decides the entire national affairs.

There is thus no absolute contrast between European/Western vs. Chinese-type responses in the sense of specific metaphor version being used exclusively by members of a particular culture but there is a distinct distributional contrast.

In addition to providing evidence of two dominant tendencies in constructing the NATION-AS-BODY metaphor, the English and Chinese samples also revealed two further versions, which depicted the respective nation either as part/organ of a larger body or as part of one's own personal body. The former perspective can be observed in the following examples:

(7) New Zealand can be seen as then middle toe of the world – while one may not acknowledge […] it when removed, the balance of the body will simply be off;

(8) China is like a cell, which is a small part of the world;

(9) China is like vein because it connects with many countries.

The alternative 'nation-as-part-of X' version, i.e. NATION AS PART OF ONE'S OWN BODY, shows up in examples such as these:

(10) England is like an *appendix*, not very significant anymore but can still cause trouble and make you realise its [*sic*] there if it wants to;

(11) The US is like the lower back. You really need it and it is a very key part. It also gives a lot of people pain;

(12) [The Chinese] Motherland likes [*sic*, presumably intended: is like] my blood. Blood is a part of my body so that I can't live without blood, and I also can't live if I lost my motherland.

Compared with such explicitly evaluative and/or ideologically charged interpretations as in the latter examples, the anatomy- and geography-based interpretations previously considered are more standardised and repetitive.

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3.2 NATION-AS-PERSON interpretations

The NATION AS PERSON variant highlights character traits or activities of PERSON TYPES, as in the following examples:

(13) England is an *ageing person*, one that has been going for a long time. […] England used to have many other *clothes* (colonies) to dress itself in. However, it has since given away all of it's [*sic*] *clothes*.

(14) New Zealand is like a *little brother chasing after the nations of the world* and clamouring for attention.

(15) […] like *Frankenstein* [i.e.: Frankenstein's monster], we [=US] have an *abnormal brain* commanding the body, which is causing our country to act and react with more negativity and distastefulness.

(16) China is like a mother, *always kind to others, turning fierce when its children are bullyed* [*sic*].

These 'personalised' metaphor interpretations are even more pragmatically and polemically elaborate and ideologically charged than the body-related variants considered above. They amount to what we previously called metaphor scenarios: they tell micro-stories about their target as a person, identifying as they do gender, character, age, likeability and giving an ethical evaluation.

3.3 Discussion: Distribution patterns and their motivation

The first finding of the survey, of which we have presented exemplary cases above, is that of a significant degree of variation in the construction of metaphor interpretations, which throws into question the assumption of an 'automatic' production and understanding of metaphors (Lakoff 1993). Instead, our survey shows that responses to metaphor interpretation tasks – when elicited by an open-ended task and with minimal priming – lead to the emergence of distinct sub-versions, based on collocation patterns and patterns of recurrent narrative-cum-argumentative elaboration. These can be grouped into five main "scenarios", which each tell a type of (often evaluatively slanted) story about the speaker's nation:

- as a physiological whole with a distinct hierarchical ordering;
- as a territorial "geobody", with more or less prominent body parts that are metonymically related to political functions
- as part of a larger body (in which it plays a more or less significant role, according to the hierarchy)
- as part of the speaker's (EGO's) own body, thus highlighting embodied identification between EGO and the nation
- as a person, with a more or less individual character, emotional state and development, gender identity, role in society etc.

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These scenarios show a characteristically distinct distribution in the corpus:

Table 1. *Scenario distributions, English L1 and Chinese samples* ("scenario tokens" = ensembles of concept tokens that collocate/combine to a narrative whole, percentages = calculated out of the overall number of scenario tokens)

Scenario distribution: English-L1	**Body**	**Geobody**	**Body part**	**Part of ego**	**Person**
Scenario tokens	68	29	14	2	32
Percentages	48%	20%	10%	1%	22%
Scenario distribution: Chinese	**Body**	**Geobody**	**Body part**	**Part of ego**	**Person**
Scenario tokens	65	91	33	34	116
Percentages	19%	27%	10%	10%	34%

The English-L1 sample is clearly dominated by the NATION AS A BODY scenario, which makes up almost half of all its scenario tokens. Together with the NATION AS A BODY PART scenario (e.g. *England as appendix*), it shows a strong interest in the differentiation and depiction of the political sphere in general, i.e. both nationally and internationally, as a hierarchically ordered, functional whole of interdependent, 'organically' joined-up whole. Conceptually, they strongly resemble the *body-politic* model that has been entrenched in English political vocabulary for at least half a millennium and fits into a cultural tradition in the West that can be traced back to antiquity.

In the Chinese sample, on the other hand, the BODY- and BODY PART-based scenarios play a much less significant role and are overshadowed by PERSON-conceptualisations, both in terms of frequency (34% – 22%) and of conceptual differentiation (60 – 20). The PERSON scenario also shows a higher frequency than GEOBODY, which had dominated the small Chinese sample in the first class test. The NATION-PERSON most frequently depicted (= 62 tokens) is that of China as MOTHER, which is usually followed up by stereotypical female-gendered character traits, such as *selflessness and protectiveness for her children, warm-heartedness, kindness, generosity, tolerance*. These characterisations are in line with patriotic songs promoted by the Communist Party, such as the "Ode to the Motherland" (Xinhua 2007) or the "Song of the Seven Sons" (Clayton 2009: 43–44).[3] Their appearance in the Chinese sample may thus well reflect ideological training for respondents from the People's Republic of China.

3. I am grateful to STD Wong for bringing this link to China's cultural history to my attention.

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MASCULINE conceptualisations are much less frequent in both the English-L1 and Chinese samples and concentrate on the OLD WISE MAN/(GRAND-)FATHER. What is absent from both the Chinese and English L1 cohorts is any evidence of explicit uses of the NATION-AS-STRICT FATHER conceptualisation that Lakoff has identified as a powerful ideological-moral basis for conservative thought in the USA, in opposition to the NURTURANT PARENT model (Lakoff 1996, 2003, 2004, 2013). Instead, across both the English L1- and Chinese data of our survey, the MALE NATION-PERSON is routinely attributed characterizations that focus on competence, wisdom and helpfulness that fall into the NURTURANT PARENT model. This result may be an effect of age and gender variables in the survey (average female majority of 60%, average 18–25 age majority of 85%); nevertheless, the fact that respondents across both cultural cohorts analysed here produced stance-taking PERSON versions of the NATION-AS-BODY metaphor shows at the very least that elicited metaphor understanding involves a production element that is not predictable from the stimulus/prime of the elicitation task.

Obviously, this creative interpretation type of metaphor reception must be distinguished from comprehension in a reductionist "processing" sense, as elicited in many psycholinguistic experiments designed to measure speed and recognition of metaphor comprehension (Gibbs 1994, 2011). However, even for the sheer processing, two phases can be distinguished: "an initial phase in which contextually appropriate and salient meanings are activated – the latter automatically and independently of contextual information, the former as a result of a predictive context – and an immediate subsequent phase of integration in which the activated meanings are either retained for further processes or suppressed as conceptually disruptive" (Giora 2003, p. 38). For the responses to our elicitation task, a further, interpretation-phase has to be posited that allows for the (re-)construction of conceptually and pragmatically enriched versions, i.e. scenario interpretation.

These findings put the CMT view of metaphor recipients as understanding and automatically accepting the conceptual frame and, together with it, an ideological bias of the metaphors they are presented with into question. The emergence of distinct interpretation trends of metaphor linguistic groups in our survey provides evidence of prominent cultural traditions that may be seen as serving as an interpretation guidance for many respondents. However, this latter result does *not* imply that the respondents have no choice in their interpretations. The entrenched interpretations may provide the most easily accessible models to follow, but they are neither the only ones available nor exempt from reflexive or meta-linguistic uses that enable speakers/writers to put the respective political bias under scrutiny. Unlike the need to quickly identify a metaphor's target referent, which may indeed be mainly a matter of quasi-automatic processing, the decision to accept or reject its scenario is in the gift of the receiver.

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4. Conclusions

The two sets of data and findings adduced here complement each other in providing evidence of conceptual variation for metaphor production and reception. One set of data consisted of naturally occurring media texts, documented in a corpus designed to show the semantic and pragmatic development in a thematically focused strand of public debate that resulted from the metaphorical slogan, *Britain at the heart of Europe,* being quoted, recycled, alluded to and reinterpreted by public voices, i.e. media and politicians. The second set consisted of elicited responses to an interpretation task that invited respondents to reconstruct a given conceptual metaphor in application to a variable target referent (the respective 'home nation'). Whilst the task itself was uniformly and successfully taken up, the resultant solutions differed in non-trivial ways, even exhibiting fundamental variation in the combination of metonymy and metaphor, and extending it to five main scenarios (NATION-AS-BODY, NATION-AS-GEOBODY, NATION AS PART OF LARGER BODY, NATION AS PART OF EGO'S OWN BODY, NATION AS PERSON), which served as platforms for evaluation and stance-taking.

The findings provide evidence of interpretative tendencies in public discourse metaphor production and of a productive-creative element in the interpretation survey. This 'interaction' between production and reception aspects resulted in substantial conceptual and pragmatic variation in the use of the two closely related metaphors, HEART AS CENTRE OF LIVING ORGANISM, NATION AS BODY, which had hitherto been regarded (mainly on the basis of English and a few other European languages) as extensions of a unitary concept, lexicalised in the *body politic* phrase. The evidence presented here shows a markedly different picture of emergent variation, some of which could be linked to culture-specific concept- and discourse-traditions. Instead of assuming an immediate "automatic" access to (and acceptance of) source concepts and/or frames, this perspective posits an intermediate, creative-interpretative level of metaphor use that includes production, quotation and reception, which metaphor users can engage with or not, i.e. choose to follow a socially dominant scenario or deviate from it.

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On the role of perceptual similarity in producing visual metaphors

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We explore here the role of perceptual similarity in producing visual metaphors. In the first part of the study, we characterize visual metaphors and show how perceptual similarity is used in various kinds of visual metaphors appearing in advertisements. In the second part, we present two studies that show that perceptual similarity is intuitively recognized, and shape-based perceptual similarity is preferred for pictorial metaphors. Finally, in the third part, we propose a system to generate visual metaphors based on algorithmic perceptual similarity.

Keywords: perceptual similarity, visual metaphors, conceptual metaphor, production of metaphor

1. Introduction

Metaphors, expressing one thing in terms of another, play a major role in communication. A typical communication scenario proceeds as follows. A speaker (or a writer) has a message to communicate, and generates some artefact (text, an image, or a gesture) that encodes the message. A reader (or a listener) receives this artefact, and tries to extract the intended message using his or her knowledge of the language, culture, and context. In this process, metaphors work at a wholistic or gestalt level by communicating a whole set of interrelated ideas at once (Keysar & Glucksberg, 1992; Rasmussen, 1991). Though there have been numerous theoretical and empirical studies on understanding metaphors, with the focus on how to extract the intended message from the artefact, production of metaphor has not been much researched, where the issue is how to generate an appropriate artefact for effectively communicating a given message.

Metaphors occur in different modalities: three major modalities are verbal, visual (Ojha, 2013; Indurkhya & Ojha, 2017; Ojha et al., 2019; Ojha, Indurkhya & Gola, 2018) and gestural. Most of the existing research has focused on verbal metaphors. However, in the last few years, several studies have been conducted

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on visual and gestural metaphors (Kennedy, 1982; Forceville, 1996, 2002; Cienki & Müller, 2008). In the research presented here, we are focusing on the problem of generating an appropriate visual metaphor for communicating a given message.

We start by considering a few studies on the production of verbal metaphor. Katz (1989) found that participants tend to choose referentially concrete concepts when they were asked to decide a source for the given target of a metaphor. This study also showed that the chosen source concepts were not far from the target domain based on their semantic distance. In another study, Chiappe and Chiappe (2007) showed the importance of working memory in the production of verbal metaphors. They found that individuals with a high working memory (tested by working memory battery) generated better metaphors compared to individuals with a low working memory. The authors argued that this difference in performance can explain unique variance in the quality of generated metaphors. In a relatively recent brain imaging study, Benedek and colleagues (Benedek et al., 2014) investigated neural correlates of figurative language production. Their results suggested that the left-prefrontal and lateral parietal brain regions are active during the generation of new metaphors, which helps in flexible integration of knowledge for the construction of novel semantic representation. Apart from these studies, in the last few years, several artificial intelligence systems have been proposed for generating metaphors (Young, 1987; You & Zhou, 2007; Veale & Hao, 2007; 2008, Veale, 2013; Harmon, 2015)

However, as far as we can determine, there are no available studies on the production of visual metaphors. In generating an appropriate visual metaphor to communicate a given message, along with exploring semantic similarity, one also needs to select an appropriate image and a suitable way to represent it. Theories of verbal metaphor suggest the importance of similarity between the target and the source in generating an apt metaphor (Bowdle & Gentner, 2005; Tversky, 1997; Johnson & Malgady, 1980). Although, Lakoff mentioned image metaphors as a subclass of verbal metaphors that are based on perceptual similarity (Lakoff, 1987), verbal metaphors primarily rely on conceptual and semantic similarity. But in a visual metaphor surface-level or perceptual similarity is also relevant (Schilperoord et al., 2009; Indurkhya & Ojha, 2013; Ojha & Indurkhya, 2016).

The focus of the research presented here is to study the role of perceptual similarity between the source and the target images in the production of visual metaphors. The chapter is organized into three parts. In the first part, we show how perceptual similarity is used in visual metaphors occurring in the advertisement genre. In the second part, we present two experiments to show that perceptually similar images are considered more appropriate for representing an intended metaphor. Finally, in the third part, we propose a system to generate visual representations of metaphor using perceptual similarity.

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2. Part 1: Visual metaphors and perceptual similarity

2.1 Introducing visual metaphors

Visual metaphors are pictorial counterparts of verbal metaphors such as "man is a wolf" and "sky is crying". In a visual metaphor (also called a pictorial metaphor) both the source and the target of a metaphor are presented as images. For example, consider Figure 1, which shows people sitting in an airport. All of them, except one, have loudspeakers for their heads. The image conveys the noisy environment of airports and suggests that people talk so loudly in airports as if "their heads were loudspeakers".



Figure 1. A visual metaphor

We must identify here a distinction between metaphor and metonymy. Metonymy is also a non-literal expression, but in it the shift of meaning is based on contiguity. When we say, "we need more hands," we mean that we need more people to help with physical work, which they will perform with their hands. Metonymies can also be found in the visual modality. Catalano and Waugh (2013) provide several examples of visual metonymies in the domain of finance, such as the picture of a specific family for all euro-zone families, picture of a Wall Street sign to refer to the financial institution, and so on. (See also Uno, Matsuda and Indurkhya 2019 for a discussion of visual metonymies in fashion.) In this chapter, we will not be considering visual metonymies.

Conceptual metaphor theory suggests that metaphors are conceptual and not necessarily linguistic (Lakoff & Johnson, 1980) implying that metaphors can occur in other modalities too such as visual, gesture and so on. Based on this assumption a number of studies have been carried out on visual metaphors occurring in cartoons (El Refaie, 2003), films (Whittock, 1990), paintings (Hausman, 1989) and advertisements (Forceville, 2002). These studies, however, have largely focused on

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the comprehension and interpretation of visual metaphors. As far as we are aware, there are no studies on the production of visual metaphors, or on how to select effective images for representing conceptual metaphors.

2.2 Production of visual metaphors

Generating a visual metaphor requires selecting two images that represents an intended metaphor. For instance, to represent the metaphor "the man is a wolf" one needs to choose images of *man* and *wolf*. In verbal metaphors, we get hints about the source and the target of the metaphor from the linear grammatical structure and the copula, but these are not available for images. Therefore, one also needs to decide how to combine the two images so that a metaphor with the intended meaning can be conveyed.

Forceville (2002) has proposed a four-way classification scheme for representing visual metaphors. (1) Pictorial or hybrid metaphor: an image is experienced as a unified object or a gestalt but actually consists of two parts that belongs to two different domains. (2) Pictorial simile: both the target and the source are represented in their entirety. (3) Contextual metaphor: one term is explicitly depicted but the other term is suggested by the pictorial context. (4) Integrated metaphor: experienced as a unified object or a gestalt, it is represented in its entirety in such a manner that it resembles another object or gestalt even without contextual cues. However, it must be noted that the selection of images and the representation of visual metaphor depends entirely on the creativity and imagination of the creator. Several such visual metaphors can be found in the advertisement genre as they aim to convey a specific message ('buy this product').

In contrast, Carroll (1994) proposed the principle of homospatiality to characterize visual metaphors. Carroll argued that a visual metaphor is assembled as a composite, non-sequential image using superimposition or composition, which must meet the requirements of *homospatiality* or *non-compossibility.* In homospatiality, different images corresponding to distant domains are fused into a single spatial frame and the spectator is forced to find a way to assimilate the fused images as the representation of something particular, thereby engaging him or her in a search akin to the quest for meaning in a verbal metaphor. In other words, the viewer is moved from the perception of that particular image to an "abstract thought about the interaction of categories" (Carroll 1994: 201).

Following Carroll, in our research, we divide visual metaphors into two main categories: (1) juxtaposed visual metaphors and (2) homospatial visual metaphors. In juxtaposed visual metaphors, images corresponding to the target and the source concepts are juxtaposed in a single frame. For example, in Figure 2a, the image of a guitar is juxtaposed with the image of a nuclear blast. In homospatial metaphors,

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on the other hand, both the target concept and the source concept are merged together in a single image. Homospatial metaphors can be further divided into two subcategories: (2.1) In partial homospatial metaphors, both the target and the source concepts are present partially but merged to create a single image. For example, in Figure 2b, lipstick and a bullet casing, both depicted partially, are merged to suggest the metaphor 'lipsticks (cosmetic products) are bullets', which draws attention to the animal testing and suffering incurred in cosmetics industry. (2.2) In complete homospatial metaphors, one concept (the target or the source) is completely replaced with another concept. For example, in Figure 2c, an alarm clock (target) is replaced by a cactus (source); and in Figure 2d, a screw driver (source) is replaced by a finger nail (target).



Figure 2. (a) juxtaposed visual metaphor, (b) partial homosopatial visual metaphor, (c) complete homospatial visual metaphor in which the target is missing, (d) complete homospatial visual metaphor in which the source is missing.

Thus, there are different possible ways for composing a visual metaphor to convey an intended meaning. However, it is not clear how these images are selected in the first place. In our previous research, we have studied the role of perceptual similarity between the source and the target images in constituting a visual metaphor. We briefly summarize this research in the following sections.

2.3 Introducing perceptual similarity

Perceptual similarity refers to similarity in terms of visually perceptual features such as color, shape, texture, orientation, and so on. For example, pairs of images shown in Figure 3 are similar in terms of perceptual features, even though conceptually they represent very different objects. It has been argued in the past (Indurkhya, 2016) that a class of metaphors are based on such perceptual similarities. For example, 'sea as a harp' metaphor present in Stepehen Spender's poem *Seascape* might be based on the perceptual similarity such as shown in Figure 4. Lakoff (1987) has also discussed *image metaphors* that are based on perceptual similarity. In recent years, a number of empirical studies have explored the role of perceptual similarities in verbal and visual metaphors (Schilperoord et al., 2009; Van Weelden et al., 2011; Indurkhya & Ojha, 2013; Ojha & Indurkhya, 2016). For example,

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in a series of eye-movement studies (Indurkhya & Ojha, 2013), it was shown that perceptual similarites between the target and the source image are subconsciously registered and anchors the metaphorical interpretation. In another study (Ojha & Indurkhya, 2016), it was shown that perceptually similar images are more likely to be interpreted metaphorically. Similarly, other behavioral studies have showed that shape-based similarities between two objects lead to establishing metaphorical relations between them (Van Weelden et al., 2011; Schilperoord et al., 2009).



(a) (b) (c)

Figure 3. Examples of perceptually similar but conceptually non-similar pairs of images



Figure 4. Potential perceptual similarities between the ocean and an unfingered harp in the poem *Seascape* by Stephen Spender

Given that perceptual similarity seems to play a role in some metaphors, we would like to examine how it influences visual metaphors

2.4 Perceptual similarity in visual metaphors

We present here an analysis of some examples of visual metaphors in advertising, and discuss how perceptual similarity helps in getting the intended message across. We consider juxtaposed visual metaphors and homospatial metaphors in turn.

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2.4.1 *Perceptual similarity in juxtaposed visual metaphors*

In a juxtaposed visual metaphor, the intended message is communicated by juxtaposing two images in a single frame. There is no obvious conceptual connection between the two images. However, perceptual similarities between the two images in terms of shape, color, texture etc. invite the viewer to explore conceptual associations between them and extract the intended message (Forceville, 2002; Schielperoord, 2009). For example, consider the image shown in Figure 5. It presents an advertisement of Gibson guitar, where the image of a guitar is juxtaposed with the image of a nuclear explosion. The similarity in the shapes of the two images is not coincidental, but a deliberate rhetorical ploy to lead the viewer into making a conceptual connection between two underlying concepts, resulting in a possible metaphorical interpretation: "The guitar is like a nuclear explosion". In this way, shape-based similarity leads the viewer to project sound-based features and conceptual features such as shocking, overwhelming, etc. from the source (nuclear explosion) to the target (Gibson guitar).



Figure 5. An example of juxtaposed visual metaphor

2.4.2 *Perceptual similarity in homospatial visual metaphors*

As mentioned above, in homospatial visual metaphors two images are merged in a single image to form a metaphor. For example, the image in Figure 6 shows a spanner with the ends of the spanner replaced by hands. The fingers of the hand are deliberately placed in a shape similar to the shape of a spanner head. This invites the viewer to connect the concepts of hands and tools, thereby forming the metaphor "tools are hands" and applying the concept of handcrafted precision

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to the Volkswagen vehicles. We categorize this as a partial homospatial visual metaphor, because both concepts (spanner and hands, in this example) are partially depicted in the composite image.



Figure 6. An example of partial homospatial visual metaphor

Another kind of homospatial visual metaphor is depicted in Figure 7, where the tongue is replaced with a fish or a dirty sock. The shapes of the fish and the sock, and their placement, are deliberately matched to the shape and the placement of the tongue to suggest a conceptual association between the tongue and a fish (or a sock) thereby forming a visual metaphor, which is different from a literal interpretation that someone is swallowing a fish or a sock. As fish and dirty socks are associated with bad odors, the visual metaphor evokes the concept of bad breath, which helps to convey the intended message of the advertiser that their product will get rid of bad breath. Moreover, presence of verbal cue "eliminate bad breath" and the placement of the company logo "clorets" further reinforces this association. In this kind of homospatial visual metaphors, only one concept is depicted, and the other one is suggested by the context and the placement of an incongruent image.

2.5 Visual metaphors vs. verbal metaphors

We would now like to emphasize one key aspect which distinguishes verbal metaphors from visual metaphors. In a verbal metaphor, because no concrete image is presented, it is left to the reader to imagine the source and the target

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in his or her own way. For example, while reading Spender's poem *Seascape*, a reader may imagine the ocean and an unfingered harp quite differently than the images presented in Figure 4 above. In this regard, on one hand, a verbal metaphor is more flexible, because the readers have the flexibility to imagine and align the source and the target in their own ways. But, on the other hand, it is also restrictive because no explicit images are provided, and the reader may not be able to get the meaning intended by the creator of the metaphor, and may reject or misunderstand the metaphor. (See Indurkhya 2016 for a more detailed discussion.)

In a visual metaphor, the images of the source and the target are explicitly provided, which constrain the reader to interpret the metaphor in a certain way. In an empirical study we conducted earlier (Ojha and Indurkhya 2016), we found that priming by image stimulation facilitates metaphoric interpretation. We could say that for communicating a specific message, as in advertisements, a visual metaphor might be more effective than a verbal metaphor.



Figure 7. An example of complete homospatial visual metaphor

3. Part 2: Two empirical studies on the role of perceptual similarity

We now present two empirical studies that explore the role of perceptual similarities in interpreting visual metaphors.

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3.1 Study 1: Judgement of perceptual similarity

The goal of this study was to determine if perceptual similarities in a given visual metaphor found in advertisements are perceived by the viewer while interpreting the metaphor. We explored a set of twenty advertisements and analyzed the perceptual similarities underlying their source and the target concepts. These twenty visual metaphors from the advertisement genre were divided into four categories. The first set of five images were juxtaposed visual metaphors. Another set of fifteen images were homospatial visual metaphors, which were further categorized into three sub categories. Five images were partial homospatial visual metaphors (in which both concepts were present but merged together). There were ten complete homospatial metaphors. In five of them, the target concept was replaced with the source concept of the intended metaphor and in the remaining five images, the source concept was replaced with the target concept of the intended metaphor. All the twenty images were shown to the participants with the intended verbal metaphors (chosen from our previous studies on similar images) and they were asked to rate the (1) perceptual similarity between the source and the target concepts of the metaphor and (2) appropriateness of the image in representing the intended metaphor. For perceptual similarity between two given concepts, we relied on the intuitive judgement of the participants and did not provide any explicit guidelines.

3.1.1 *Procedure and task*

Eighteen Participants (ten male and eight female undergraduate students) were shown all the twenty images with corresponding metaphors. They were given two tasks. In the first task, they were told about the perceptual similarity and asked to examine the metaphors and their pictorial representation, and then to rate the perceptual similarity in general between the target and the source images of the metaphor on a scale of 0–7. In the second task, they were asked to rate the appropriateness of the pictorial representation of the intended metaphor on a scale of 0–7. They were also asked to mention the kind of similarity they found (color, shape, orientation, etc).

3.1.2 *Results*

Results (Table 1) showed a high perceptual similarity rating and appropriateness rating for complete homosopatial metaphors. The average perceptual similarity rating was 5.3 and the average appropriateness rating was 5.45 for all four categories. However, the appropriateness rating for complete metaphors was relatively higher than the juxtaposed metaphors, $T(1, 18) = 2.1$, $p < 0.05$ and partial homospatial metaphors ($T(1, 18) = 2.87$, $p < 0.01$). Results also showed a positive correlation between the appropriateness ratings and the perceptual similarity ratings $R(1,18) = 2.96$, $p < 0.01$.

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Table 1. Perceptual similarity and appropriateness rating

		Homospatial visual metaphors		
	Juxtaposed visual metaphors	**Partial**	**Complete: The source explicit**	**Complete: The target explicit**
Perceptual similarity rating	4.7	4.5	6.7	6.2
Appropriateness rating	3.6	5.2	6.3	6.7

3.1.3 *Discussion*

The experimental results suggest that perceptual similarities between the source and the target of an intended metaphor are perceived intuitively. In particular, in the case of complete homospatial metaphors, perceived similarity is higher as compared to the other classes of visual metaphor. Interestingly, in these other visual metaphors, one of the concepts is not shown at all, but still it must be compared with the other explicitly depicted concept. This means that while imagining the contextually suggested missing concept of the metaphor, the participants chose an image that was perceptually similar to the depicted image. The results also show that the perceptual similarity positively correlates with the appropriateness of representation. That is, a greater perceived perceptual similarity suggests a more appropriate metaphor. It is also important to note that in most cases (320 instances), the participants reported similarity at the level of shape as compared to color (60 instances) and orientation (24 instances). Response of a participant for one metaphor was considered as one instance. Overall, there were 360 response instances. This result is consistent with our previous study (Ojha & Indurkhya, 2016), where participants were given a verbal metaphor in the X-is-Y format, and primed with images of the target or the source or both during the metaphorical interpretation task. The results suggested that image priming facilitates creative metaphorical comprehension process. In yet another study (Indurkhya & Ojha, 2013), participants chose a perceptually and conceptually similar image for a given target in a metaphor generation task suggesting that perceptual features and similarities at the perceptual level are considered during the processes of metaphor comprehension and generation.

3.2 Study 2: Shape-based perceptual similarity in the production of visual metaphors

In the second study, we tested the role of shape-based perceptual similarity in the production of pictorial representation of an intended metaphor. There are two methodological issues regarding the design of such a study. The first is related to the response of the participants, for it is not easy for all the participants to draw

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images for an intended metaphor. The second issue is the objective determination of perceptual similarity between two concepts. To address these issues, we chose the stimuli material of Van Weelden (2017), which included two sets of images for the same target and the source: one set of perceptually similar pair of images and another set of perceptually non-similar pair of images. We conducted the study under two conditions. In one condition, the participants were given a metaphor and were asked to (1) choose an appropriate pictorial representation from a given set of choices, and (2) rate the appropriateness of the given pairs of images in representing a given metaphor. In the second condition, the participants were also given a list of ten metaphorical features. Our goal for this experimental condition was to check if metaphor features influence the selection of perceptually similar images.

3.2.1 *Preparation of stimulus material*

To prepare the stimulus material, 24 pairs of images, each pair consisting of a metaphor target and a source, were selected from the work of Van Weelden (2017). Twelve of these pairs were classified as perceptually similar, i.e. the outline shape of the source was similar to the target image; and twelve of them were classified as perceptually non-similar, i.e. the outline shape of the source was dissimilar to the target. The criteria and procedure for judging perceptual similarity are mentioned in Van Weelden et al. (2013, 2017). For our present study, a pre-test was conducted with a group of nine participants, in which all the image pairs were shown to them, and they were asked to (1) generate a corresponding verbal metaphor, and (2) generate at least ten features for the metaphor. Based on the participants' agreement, twelve metaphors were chosen. Each metaphor had five features associated with it that were used in the final experiment.

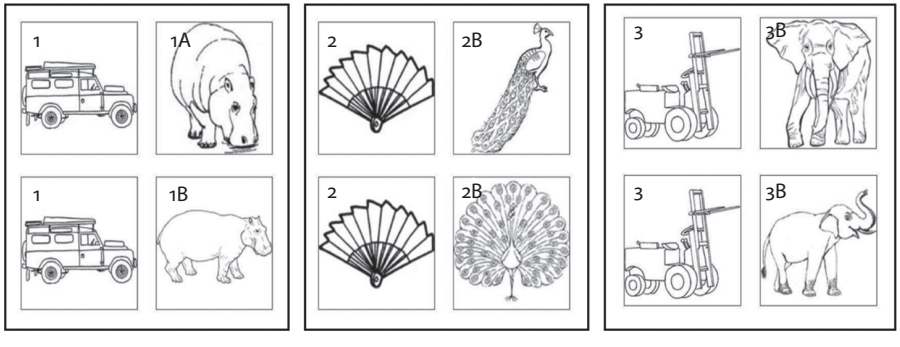


Figure 8. Perceptually similar pairs (1 and 1A, 2 and 2A, 3 and 3A) and non-similar pairs (1 and 1B, 2 and 2B, 3 and 3B) used in the study

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3.2.2 *Condition 1*

3.2.2.1 Participants

Seventeen undergraduate students (ten males and seven females) from India (eleven) and Italy (six) (with a mean age of 21.2 years) participated in this study. All the participants were fluent in English.

3.2.2.2 Procedure and task

The participants were given twelve verbal metaphors in the 'X is Y' format to read. Then they were given two pairs of images corresponding to the given verbal metaphor, and were asked to do two tasks. First, they had to decide which of the two pairs would appropriately represent the given verbal metaphor. Second, they were asked, "why do you think so?"

3.2.3 *Condition 2*

3.2.3.1 Participants

Fifteen undergraduate students (five males and ten females) from India (eleven) and Italy (four) (with a mean age of 19 years) participated in this study. All the participants were fluent in English.

3.2.3.2 Procedure and task

The participants were given a metaphor in 'X is Y' format with ten features. Then they were shown two pairs of images. They were asked to rate the appropriateness of the pairs to represent the intended metaphor with the given features on the scale of 1–7 (1 being the least appropriate and 7 being the most appropriate).

3.2.4 *Results*

The results of Condition 1 showed that the participants took less time to choose perceptually similar image pairs (1.8 seconds) as compared to perceptually non-similar image pairs (2.9 seconds). This difference was statistically significant $T(1,18) = 3.01$, $p < 0.01$. Moreover, the results also showed that 83.4% of the participants chose perceptually similar images. The results of Condition 2 showed a significantly higher appropriateness rating for perceptually similar images compared to perceptually non-similar images $T = (1,18) = 2.34$, $p < 0.05$.

Table 2. Results of study in condition 1

	Percentage	**Response time**
Perceptually Similar Pairs	83.4	1.8
Perceptually non-similar pairs	16.6	2.9

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Table 3. Results of study in condition 2

	Average appropriateness rating of representation
Perceptually Similar Pairs	6.4
Perceptually non-similar pairs	2.1

3.2.5 *Discussion*

This study explored if perceptually similar images are preferred to represent an intended visual metaphor. The results showed that the participants took a shorter time to choose perceptually similar images. It was also found that metaphorical features do not have a significant effect on the image selection. Perceptually similar images are considered more appropriate to represent the metaphor in all conditions. This suggests that perceptual similarity plays a crucial role in selecting images to depict an intended metaphor in pictures. In our previous study, we proposed a model for visual metaphor processing (Ojha & Indurkhya, 2016), which makes a distinction between the conceptual and perceptual spaces, and posits top-down and bottom-up mechanisms that allow features in these two spaces to stimulate each other. Top-down processes allow conceptual features in the conceptual space to stimulate perceptual features in the perceptual space, and bottom-up processes allow perceptual features in the perceptual space to stimulate conceptual features in the conceptual space. According to this model, in comprehending a visual metaphor, perceptual similarity in perceptual space is perceived prior to conceptual similarity in conceptual space and facilitates metaphorical interpretation. In later part of the process, greater deliberation on the metaphor, allows perceptual features to stimulate conceptual features related to them and helps interpreting metaphors more creatively. These two stages correspond, respectively, to System 1 and System 2 responses of Kahneman (2011).

4. Part 3: A system to generate perceptually similar images for an intended metaphor

In this section, we present our ongoing work on a creativity assistance system called I-get. It is designed to be an online creativity assistance tool to generate visual metaphors using perceptual similarity between the source and the target images. Overall, the system aims to find and link perceptually similar images using an image-based search algorithm. It also stores user-supplied conceptual categories for these pairs. The system is designed to suggest perceptually similar images from its database with a history of user-supplied conceptual interpretations and

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aptness to represent a possible metaphor. Based on the empirical result presented above, we expect that the juxtaposition of perceptually similar images will evoke alternative associations in the mind of the user that are surprising and novel.

4.1 Design approach

I-get groups images at two levels: perceptual and conceptual. For determining perceptual similarity between images, we use a feature-based image retrieval system called FISH (Tandon et al., 2008). This system determines similarity between pairs of images based on common perceptual features such as shape, color, texture, etc. The whole database of images is thus partitioned into perceptual cliques: sets of images that are linked to one another. For gathering potential conceptual similarities between perceptually similar images, we use a crowdsourcing approach. Users are shown image pairs and are asked to interpret them metaphorically. This allows us to compute a conceptual similarity index for an image pair, which increases when more users rate the images in the pair as similar.

4.2 System architecture

The system is designed to find perceptually similar source images for a given target image (provided by the user), and to generate juxtaposed and homospatial metaphors with contexts (Figure 9).

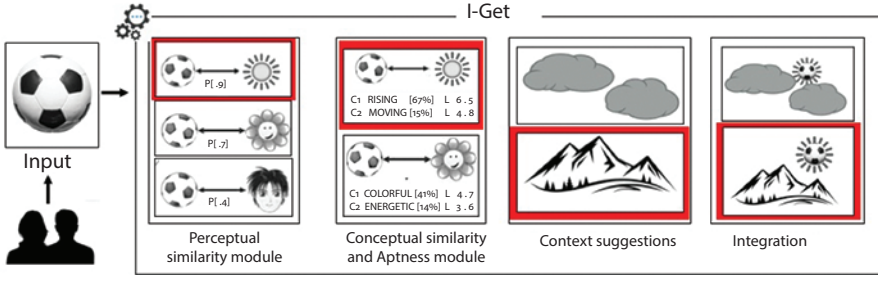


Figure 9. An example illustrating the architecture of the proposed system. The system generates juxtaposed and homospatial metaphors with context by analyzing perceptual similarity, conceptual links and aptness rating provided by previous users. The output could be interpreted as "soccer ball is a rising sun". The red blocks indicate choices made by a user.

The system is under development, and we explain below its underlying algorithm:

- Step 1: The user inputs a target concept, either as text or an image.
- Step 2: If the target concept is provided as text, the system suggests a set of images for this concept from the data base, and the user is asked to choose

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one. If the target concept is provided as an image, then that becomes the target image. For example, the user can input a soccer ball (the target) as a text or as an image. If it is inputted as a text, then the system shows different images of soccer balls and the user is asked to choose one.

- Step 3: The perceptual similarity module finds perceptually similar images as potential source concepts for the target concept. These images are displayed to the user together with the target image. In the soccer ball example, the system may provide images of the sun, a sunflower, or a face (Figure 9).
- Step 4: The user is then asked to choose the pair of images most suitable as a metaphor. At this point, the user is given an option to view possible conceptual associations between the image pairs that were collected through crowd sourcing using the conceptual similarity module. For soccer ball example, if the user chooses the sun as a potential source for the target, then some conceptually similar features such as "rising" and "moving" are displayed, which were provided by previous users. The user is also shown how many previous users have provided a particular conceptual association. For example, "rising" is provided by 67% users and "moving" is provided by 15% users. At this stage, the user is also shown an average aptness rating for the similar pair of images, if and when they are interpreted metaphorically (using the aptness module). The pairs of images (if interpreted metaphorically) are basically juxtaposed metaphors, and the user is given a choice to download it, or to proceed with the next module for context suggestion and morphing.
- Step 5: Then user is provided some pictorial contexts (retrieved from the system database), which are images related (based on WordNet) to the source concept. For soccer ball is a rising sun, the system suggests "clouds" or "mountain range" as they are closely associated with the source concept "sun". (Figure 9). The user can choose any of the provided pictorial context.
- Step 6. Finally, the system provides fused (e.g., soccer ball and sun) image within the chosen context (e.g., mountain range) as a homospatial metaphor using the morphing tool. The morphing tool allows partial or complete fusion of images.

We now describe the functioning of each module in more detail.

4.3 Perceptual similarity module

The first part of the system is the perceptual similarity module. The input image query (the target image of an intended metaphor) is searched for a similar image based on its perceptual features such as shape, color, orientation, etc. There are several feature-based image matching systems (Kiyoki, Kitagawa, Hayama,

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1994), and we use FISH (Fast Image Search in Huge Database) (Tandon et al., 2008). The system processes each query image into an internal representation and searches for similar images in a large database. The search is fast, in sub-second times, and uses an index structure pre-compiled for each image: each image X in the system is represented as a vector of numeric feature values [*X1,X2,…..,XD]*. The space of all possible vectors constitutes a *D*-dimensional space in which each image is a point. The general features used in any image retrieval system are color, texture and shape descriptors. Color descriptors, though weak in description, allow flexibility in use through variations ranging from the global histogram to the color layout descriptors. Texture is generally highly dependent on the homogeneity and regularity of the pixel patterns. Shape is difficult to extract and represent. In FISH, a weighted combination of generic descriptors accepted by the research community is selected experimentally. The combination includes mean, variance and skew color moments, MPEG-7 Color Layout Descriptor (CLD), MPEG-7 Color Structure Descriptor (CSD) and MPEG-7 Texture Browsing Descriptor (TBD). Weights are used to counter variations in numeric scales across these characteristics.

This numeric vector is then used as the signature for the image. Based on the signatures, the system retrieves images from the database, which are perceptually similar to the query in the form of similarity strength. This strength is between 0–10: with a 0 indicating no similarity and 10 indicating identity. So, in the example of 'soccer is rising sun,' searching with the image of a soccer ball, the sun image yields a high perceptual rating, and is retrieved.

4.4 Conceptual similarity module

Conceptual similarity is also important to generate metaphors. Though we used an algorithmic approach to determine perceptual similarities, a crowdsourcing approach is employed to assess conceptual similarities. For this, pairs of images are randomly shown to the participants, who are asked to suggest a word that can be used to associate both images. Along with the images related to intended metaphor, other source images are also shown for conceptual associations. Then images are paired, and weights of the already paired images are modified, on the basis of user-generated conceptual association. If a pair is labeled with the same concept, the weight for that pair is increased. If a pair is labeled with another concept, then a new conceptual link between them is established. Conceptual links between the two images are denoted by *C1, C2….Cd* whereas perceptual link is denoted as *PX*. X is the output of FISH (between 0–10: 0 indicating little perceptual similarity and 10 indicating identity).

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4.5 Aptness module, context suggestion and integration tool

The tool is designed to also collect aptness of an intended metaphor for a given pair of images. When a pair of images is presented to the participants for conceptual associations, they are also asked to rate the appropriateness of the associations. In particular, they are asked, "how much do you like this pair of images for a metaphorical interpretation" (on a scale of 0–10). For each pair, average aptness is calculated and presented to the users later. Along with pictorial representation of intended metaphor, the tool also suggests pictorial (mostly as clipart of a particular concept) contexts and scenarios to provide the background for the chosen image pair. The suggested pictorial context is primarily related to the source concept. To find the relationship between the source and the context, WordNet is used (Bhatt, Ojha & Indurkhya, 2011). In our soccer ball example, the soccer ball is shown as a rising sun from the back of mountains or clouds, as concepts such as "sun", "rising" are closely associated with "mountains" or "clouds". Once the images are paired on the basis of their perceptual similarity, weights are given to their conceptual association, and a context is chosen by the user, a morphing tool fuses the perceptually similar images partially or completely.

4.6 Status and evaluation of the system

The proposed system is under development and is not currently available online. However, the perceptual similarity module has been partially tested. The evaluation of perceptual similarity part included presenting the perceptually similar image pairs generated by the tool to the participants and asking them if they could come up with a possible metaphor. An experiment with 17 participants was conducted to test the performance of perceptual similarity module. In the experiment, we aimed to determine if the perceptually similar images suggested by I-get are more likely to be interpreted metaphorically than randomly paired images. Fifty-four image pairs retrieved from I-get and fifty-four random image pairs were shown to the participants, who were asked to interpret the given image pair literally or metaphorically. If a participant could not think of any metaphorical interpretation for a given pair, she or he could skip it and move to the next pair.

The results showed that 87% of perceptually similar image pairs were given metaphorical interpretations, whereas only 62% random image pairs were given metaphorical interpretations (Figure 10) This suggests that perceptually similar image pairs suggested by I-get are more likely to be interpreted metaphorically. Among random image pairs, a large number were considered nonsensical, whereas this proportion was very low for image pairs suggested by I-get.

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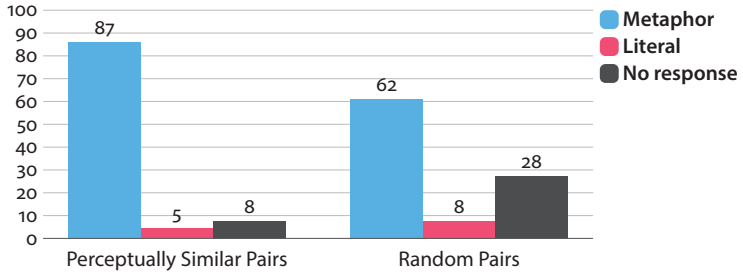


Figure 10. Metaphorical interpretation given by respondents for perceptually similar pairs and random pairs of images.

4.7 Discussion

Finally, we would like to make some philosophical observations about the design of I-get. Our approach is consistent with Davidson's view (about verbal metaphors) that though a metaphor only means what the words in it literally say, it is effective primarily through its illocutionary force, which goes beyond the meaning of the metaphor (Davidson, 1978). This idea is also echoed in Carston's theory of imagistic metaphor (Carston, 2010). So, in the example of the exploding guitar, the visual metaphor conveys a phenomenology of powerfulness afforded by the instrument at an intuitive level (System 1 response of Kahneman 2011), which is only later turned into a proposition somewhere later down the line and with considerable linguistic work (System 2 response of Kahneman 2011). (See Figures 14 and 15 in Indurkhya & Ojha 2017, and their associated descriptions.) Thus, our approach offers an alternative to the techniques based on data driven NLP and/or structured semantic representations (Veale & Hao, 2007).

5. Conclusions

This study explored the role of perceptual similarity in generating visual metaphors. There are three outcomes of this study. First, we found that advertisements make use of perceptual similarity to generate visual metaphors. Both in juxtaposed visual metaphors and in homospatial visual metaphors, perceptual similarity plays an important role by inviting the viewer to consider metaphorical interpretation of an image. Second, our experimental study showed that perceptual similarity between the target and the source are perceived intuitively. Moreover, shape-based similarity between images is considered more appropriate to pictorially represent an intended metaphor. Finally, we proposed a real-time computational system to generate perceptually and conceptually similar images to represent a visual metaphor.

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SECTION 2

General empirical studies – other

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On why people don't say what they mean

Production of figurative formulaic language

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University of Alberta

The study addresses two problems with recent psycholinguistic research on why people don't say what they mean, (1) possible underrepresentation in research studies of types of figurative language found in everyday talk, and (2) potential ecological validity problems due to using standard psycholinguistic experimental methodologies and inauthentic language materials. In three experiments, these problems were addressed using authentic productions of a relatively unexplored figurative language type – formulaic language, specifically *gratitude acknowledgements*, which cover a range of figurativity (e.g., "don't worry about it", through, "anytime"), often using hyperbole as part of their functioning – a key focus of the present study. The results demonstrate that speakers use figurative gratitude acknowledgements to achieve the pragmatic effects of politeness and esteem display as well as fondness expression, which are not achieved to the same extents by nonfigurative gratitude acknowledgements. The particular pragmatics of this figurative form, the influence of these pragmatic effects on some theoretical questions, and the broader implications of inclusion of new figurative language forms, as well as authentic language items and methods, in research on figurative language production and pragmatics, are discussed.

Keywords: figurative, pragmatic effects, psychology, pragmatics, production, comprehension, language understanding, human experimentation, routine formulas, ecological validity, formulaic language, gratitude acknowledgment

People frequently don't say what they mean. Whether they use some type of indirect (e.g., lateral statements [i.e., a stage-whispered, "I close kitchen cabinets when I'm done with them, unlike some people I know"], indirect requests [i.e., "could I borrow a sweater?], negated statements, [i.e., "it wasn't bad"], etc.), figurative (e.g., metaphor, verbal irony, hyperbole, etc.), or other kind of similar language, much of what people say in normal everyday talk does not directly correspond with what the speakers intend to communicate.

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Much of the psycholinguistic research investigating figurative language has accordingly attempted to answer the question of *how various kinds of figurative language types are comprehended*. This question is motivated because the nonfigurative meanings of figurative utterances do not veridically correspond to their speaker's intended meaning. Comprehension thus cannot be fully explained by the simple processing of the syntactically corralled semantic meaning of the words making up these utterances.

A different but related question of, *why is figurative language used,* has been addressed, however, in a growing recent literature (see below). This question is in part motivated by an arguably greater risk of miscomprehension presented by figurative language relative to more nonfigurative language, given a greater number of possible interpretations and or a greater complexity of figurative utterances. To illustrate this point, although obviously an oversimplification, at minimum two viable meanings are available for a figurative utterance such as the verbal irony, "well done", said about a target person's mistake (e.g., nonfigurative [*you did well*] & figurative [*you did NOT do well*]), where only one meaning is viable for a nonfigurative utterance (e.g., as in the same utterance above said about a person's success, nonfigurative [*you did well*]).[1]

Given generally acknowledged conversational rules for speaking clearly and concisely (Grice, 1975), this miscomprehension risk presupposes some justification for speaking figuratively. This justification *in general* is that figurative language achieves various pragmatic effects that nonfigurative language either cannot, or cannot as easily, accomplish for speakers (Colston, 2015). Investigation then usually centers on explaining *how* figurative language performs these functions, and to what extent underlying basic linguistic, cognitive and social principles and/or embodied substrates predict *which* functions will be accomplished and their *extent* (Becker, Kimmel, & Bevill, 1989; Clark & Schunk, 1980, 1981; Colston, 1997a, 1997b, 1999a, 1999b, 2000a, 2000b, 2002a; 2015; Colston & Gibbs, 1998; Colston & Keller, 1998; Colston & O'Brien, 2000a, 2000b; Dews & Winner, 1995, 1999; Dews, Kaplan & Winner, 1995; Gernsbacher & Robertson, 1999; Gibbs, 1981a, 1981b,

1. Whether one considers "nonfigurative" and "figurative" types of language as separate categories, or instead as areas of language that, although potentially overlapping, typically tend toward different ends of a continuum varying from relatively little complexity, density or richness, to relatively more, one must still acknowledge that these ends of the continuum differ in the degree to which their intended comprehended meanings separate from whatever one wishes to call "language" meaning. For the "nonfigurative" forms the separation is primarily one of underdeterminedness, for "figurative" this separation is one of underdeterminedness plus typically something more (e.g., contradiction, atopicality, etc.) (Colston, 2005; 2015).

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1986, 1987, 2000; Gibbs & Mueller, 1988; Hancock, Dunham & Purdy, 2000; Holtgraves, 1986, 1994, 1998, 1999; Kemper & Thissen, 1981; Kreuz, 2000; Kreuz, Long & Church, 1991; Roberts & Kreuz, 1994; Schwoebel, Dews, Winner & Srinivas, 2000; Toplak & Katz, 2000; Whaley & Holloway, 1996).

Two important problems apply to much of this latter research, however, which to-date have not garnered much attention in mainstream psycholinguistics. These problems raise significant concerns for ecological validity in emerging accounts of pragmatic functioning by figurative language. The first problem involves the *types* of language frequently addressed in figurative language studies. The second problem arises from the typical *methodologies* used in this research and their potential shortcomings.

The following report describes a study investigating the question of *why people don't say what they mean* in such a way as to address both of these problems simultaneously. As it turns out, the problems are conveniently related such that a solution to one problem can also address the other. The broad implications of such a solution are then discussed.

1. Problems with figurative language usage research: Types

The recent research on, *why people don't say what they mean*, is heavily biased toward only one of at least two and perhaps more, broad categories of language involving figurativity – *nonformulaic* figurative language. Most of that work also concentrates on just a few sub-types (e.g., metaphor, verbal irony, idioms, metonymy, proverbs, indirect requests, indirect replies and a few others). We thus may be constructing explanations for figurative language use and processing which do not encompass all the intricacies found in all figurative language types, such as in *formulaic* figurative language.

It is important before proceeding to distinguish between what is used here to mean formulaic (with the related oppositional "non-formulaic") and another categorical dichotomy, fixed versus unfixed language. Many kinds of language are considered fixed to some degree, in that clauses, phrases, constructions or even longer pieces (e.g., pledges) have a tendency toward fixedness – they usually take the same, or at least a very similar form in usage. Idioms, proverbs and other figurative types of such "fixed" language belong to this category due to their tendency toward such consistency. Idioms and proverbs (e.g., "Bite the bullet", "Look before you leap", etc.) can nonetheless vary quite extensively in that some are highly non-decomposable – a subset of idioms and proverbs which almost never work in usage without matching the exact standard form. Whereas others can be more

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decomposable or flexible (e.g., saying, "Well, his bucket finally got kicked", about a person who died, but perhaps had lived unexpectedly long, maybe after having endured some protracted illness), (Geeraert, Newman & Baayen, 2017; Moon, 1998). On this view, many formulaic forms are also fixed to a degree, but not so much in a phrasal sense as in idioms and proverbs, but rather in a contextual and ritualistic dialog one.

Formulaic language, somewhat differently, is used here to mean language for managing common, everyday social interaction situations (i.e., greetings, farewells, apologies, gratitude expression, etc. [e.g., "Hi", "What's goin on?", "See you later", "Sorry, my bad", "Thanks a lot, I appreciate it", etc.), often in patterns of dialog between interlocutors. But formulas such as these are considered to have less of a degree of encapsulated meaning than is found for idioms and proverbs. In terms of fixedness, formulaic language is often fixed to a degree. But fixed language is not necessarily formulaic.

A great deal of debate is ongoing about both how to define these categories, as well as the degree to which they should be considered "dead" or fossilized, versus alive and kicking with meaning (Gibbs, 2017). The goal of the present work is not to attempt to refine these definitional arguments, but rather to note how relatively little research has looked at figurativity in the central core of formulaic forms such as greetings, farewells, etc., or especially in gratitude acknowledgements, which are argued below to have special import for considerations of figurative pragmatic effects. I nonetheless hold the view that both relatively fixed and formulaic forms are more alive than fossilized, in that they seem to play active rolls in subtle meaning alterations instead of being merely pre-packaged, stored, dead forms (Colston, 2019).

Relatively little psycholinguistic research has addressed this key category of potentially figurative language, formulaic language – or more specifically, *routine formulas* which are frequently figurative. Routine formulas refer to common, ritualized utterances which are fairly stable in form, unfold readily in conversations, and are used in regularly occurring, social situations (Coulmas, 1998; Eson, 1977; Zegarac, 1998). Example forms again include greetings, farewells, apologies, gratitude expressions, gratitude acknowledgements, etc. It should be emphasized that, although they may be somewhat underspecified, not all routine formula tokens are greatly figurative (e.g., "Good to see you", "bye", "sorry", "thanks", "no problem", etc.). But, many routine formulas nevertheless are figurative through the use of metaphor, hyperbole or some other figurative mechanism (e.g., "What's up?", "Catch you later", "Thanks a million", "You're a life saver", "Anytime", etc.). Figurative routine formulas may also have characteristics distinguishing them from other types of figurative language. Among these are the conventionality and prevalence of their forms, and their risk/cost of misinterpretation.

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1.1 Conventionality/prevalence

Considering conventionality and prevalence first, figurative routine formulas are likely fairly prevalent. In comparison to some types of figurative language, verbal irony for instance, which we know varies in its prevalence according to region and culture (Dress, Kreuz, Link & Caucci, 2008; Kreuz & Link, 2002). But routine formulas, as a form of common social interaction using many different kinds of ritualized phrases are probably quite widespread. Figurative routine formulas may also be more conventional, in the sense of being ritualized, than many kinds of standard figures such as metaphors, despite the existence of conventional *kinds* of metaphors (e.g., systematic conceptual metaphors – ACCOMPLISHMENT IS MOVEMENT THROUGH PHYSICAL SPACE, nominal metaphors – X is a Y, etc.) and even some conventional metaphors themselves (e.g., a person, "Blew her stack" [got very angry]). Figurative routine formulas are probably no more or less conventional that the typically studied *fixed* figurative types like idioms and proverbs, though, or indirect types like indirect requests. But they could be as prevalent.

Admittedly some of these specific claims are speculative at present. But the point nonetheless likely holds that a certain degree of regularized, repetitive, ritualized conventionality distinguishes figurative routine formulas from other kinds of figurative language. This is the case even when a routine formula is made figurative by means of standard figurativeness mechanisms such as those found in metaphor (discuss topics via vehicles) hyperbole (inflate discrepancies between reality and expectations), etc. Such regularity is inherent in the definition of routine formulas.

The kinds of figurative language researchers have mostly studied also typically involve only a moderate risk of miscomprehension, and/or relatively low costs of miscomprehension. This interestingly is despite the fact that one argument for studying pragmatic effects of figurative language is its supposed higher risk of miscomprehension relative to nonfigurative language, a difference which may not actually exist (see Colston, 2002b; 2015).

1.2 Risks/costs

Considering risk first, genuine cases of *mis*comprehention, relative to *lack* of comprehension, of some standard figurative forms might be rare because the nonfigurative meanings of those utterances blatantly misfit their standard contexts. For instance, several types of figurative language, as in some instances of verbal irony (e.g., sarcasm, "What a perfect weekend", to describe a bad weekend), involve statements patently and obviously untrue if taken nonfiguratively.[2] The nonfigurative meanings of these utterances would thus not likely be the final

2. Assuming of course that the hearer/reader is aware of the actual nature of the weather.

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product of the comprehension process of at least normal adults, even though such misinterpretation remains possible. Other types of figurative language, as in some novel and even well-established metaphors, do not make obvious sense if taken nonfiguratively (e.g., "He is such a weeble", "She is bright", etc.). These forms thus also don't pose a very high risk of *mis*interpretation. Although it remains possible they would just be *not* understood. Relative to cases of figurative language where the nonfigurative meaning isn't intended but is nevertheless sensibly and readily interpretable in the context of use, these other types might pose less miscomprehension risk.

Considering costs of miscomprehension, several frequently encountered and oft studied forms of figurative language may have a lesser likelihood of *mis*comprehension (or *lack* of comprehension) to begin with. For instance metaphors based on common conceptual metaphors (e.g., MORE is UP), transparent idioms (e.g., get lost) or hyperboles based on conventional forms of expectation/reality discrepancy inflation (e.g., it's freezing in here) rely on robust figurative meaning mechanisms which reduce the likelihood of miscomprehension in normal speakers. Moreover, if these forms nonetheless end up *un*comprehended, the only cost would be the missed meaning. More severe costs might arise if the utterances are *mis*comprehended and repair becomes necessary. Repair situations could involve costs of time, effort, frustration, bad feeling, missed opportunity, etc. But even these outcomes, although undesirable, may not prove serious for the conversation, the interlocutors, their social relationship, etc. These standard forms of figurative language thus appear to have minor costs relative to types where a more serious negative outcome could ensue from *mis*comprehension.

But at least one figurative routine formula could pose a significant risk of misinterpretation and/or have a particularly high cost for interlocutors if miscomprehended. In this type of language, the nonfigurative meaning of the utterance *can* readily fit the context. A misinterpretation of this form could also result in subsequent undesirable behavior that, beyond the more minor costs of miscomprehension just discussed, could be very difficult for the speaker to correct. Miscomprehension of this form could also greatly pressure the social relationship between the interlocutors. This routine formula has been referred to previously as *gratitude acknowledgements*[3] (Colston, 2002b). For example, a speaker has been thanked for something and replies using comments such as, "My pleasure", "You're welcome", "Don't worry about it", "Glad to help", "Anytime", etc. The details of this

3. Not to be confused with gratitude expressions, for which there is a large cross-disciplinary literature.

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type of language, its pragmatic effects, the mechanisms underlying its pragmatic effects, and its misinterpretation risks and costs are taken up below.

To address the first broad problem of potential differences between the heretofore dominant figurative types and other kinds of figurative language in addressing the research question of, *why don't people say what they mean*, the current study poses the question by investigating the relatively unexplored gratitude acknowledgment type of figurative language that, in being formulaic, is relatively conventional as well as prevalent. Moreover, due to its particular nature, gratitude acknowledgment can be particularly problematic for interlocutors if misinterpreted, in terms of risks and costs to interlocutors (see below), (Colston, 2002b; Coupland, Coupland & Robinson, 1992; Schneider, 1988; Zegarac, 1998 & Zegarac & Clark, 1999).

Next, consider the other problem in recent nonliteral language research – the issue concerning research methodologies.

2. Problems with figurative language usage research: Methods

The predominant methodology used by psycholinguists who study figurative language is experimentation. For purposes of control and manipulation, as is well known to most psycholinguists and many other language scholars as a means of identifying cause/effect chains, studies typically involve the presentation of carefully designed, experimenter-crafted situations and utterances, in written or audio/video/digital recorded forms, to participants who are ideally representative of populations of interest. The sets of situation/utterance items are manipulated somehow to introduce variables as potential causal agents. Participants are then asked to perform some language related task(s) involving the items, and a wide variety of measurements (e.g., utterance reading times, memory accuracy, on-line cross-modal synonym naming latency, subjective off-line ratings, eye gaze measures, etc.) are taken to tap into potential effect agents. Although the specific details of the application of this methodology to psycholinguistic studies may not be widely known to all language scholars, the general technique is pervasive in language research generally, and is very familiar to a psychological audience.

Not universally known among psychologists, nor even among psycholinguists, however, is a potentially damaging problem with this methodology discussed among allied fields also interested in pragmatics and figurative language (Kotthoff, 2003). The essential criticism concerns ecological validity – the rich, socio-cognitive nuance of actual talk concerning an infinity of contexts and topics, among varieties of kinds of interlocutors, with their rich subjective experiences

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and mutual knowledge of these, is severely compromised with the introduction of strict laboratory methodologies, items, tasks and measures. Although some very low-level auditory, phonological, morphological or perhaps higher phenomena might be studied with laboratory techniques, so the criticism goes, many phenomena at those levels, and *any* phenomenon perhaps involving semantics but certainly concerning pragmatics, is made insurmountably artificial if not studied in situ. Proponents of this criticism therefore use observational or other archival methodologies designed to capture, as best as possible, actual language used by real people in a variety of real-world settings. Recordings and rich transcripts of that language are then studied to determine its nature and to draw inferences about speaker/listener cognitive processes, intentions, language functioning, etc.

Counter criticisms offered against these conversational, discourse analysis or corpus methodologies are typical of arguments against observational or archival methods; that although they might allow cursory descriptive accounts of language phenomena they afford poor means of reliable generalizability across participant or language type populations, that the precise identity of causal agents is indeterminate, that the cognitive state(s) of interlocutors involved in the language is relatively inaccessible, that the content of a corpus may not generalize to all relevantly similar language usage, etc. (Katz, 2017).

My position in this debate had initially, at least publicly, been in defense of the more rigid psychologically oriented paradigms, for the reasons predictable from training in cognitive psychology/psycholinguistics. However, the intricacies of the mechanisms underlying many phenomena discussed in literatures on pragmatics and figurative language, make me increasingly sensitive to concerns of scholars in the allied language fields. Moreover, it seems increasingly unproductive to engage in warring debates about which methods are better than others. All methods have limitations. All methods also have advantages. The best strategy would seem to embrace a wide array of methods and use them collectively and strategically to address the phenomena under question (Colston, 2015; Colston & Athanasiadou, 2017; Katz, 2017).

To address this second problem of potentially impoverished findings in psycholinguistic research on *why people don't say what they mean,* due potentially to restrictive laboratory methodologies, the present study used a compromise methodology which hopefully couples at least some ecological validity of conversation/discourse/corpus analysis with the causation transparency of experimentation. The technique involves placing experimental participants in a variety of controlled, contrived situations, but then allowing them to create relatively genuine language within these settings. These utterances are then recorded and presented to a separate group of participants, who are then asked to comprehend and assess the utterances with various measures being taken.

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3. Solution: A study of pragmatic effects of gratitude acknowledgements using elicited authentic productions

A convenient connection between the problems discussed above enables one solution to address both problems. In order to widen the scope of figurativity studied (problem 1) we need to move beyond standard figurative forms. To address the ecological validity of the language used in common experimental paradigms, study items and methods need to be more authentic. Yet, to preserve a reasonable degree of variable control, purely observational work can be lacking (problem 2). A possible solution is to collect actual productions from speakers, yet control experimentally the situations in which these productions are made. Given the well-known difficulty in elicitation/production tasks of keeping produced utterances constrained to the topic of interest, as well as preserving the authenticity of the utterances, however, one must use a language type which affords ready yet authentic production.

As it turns out, routine formulas, in particular gratitude acknowledgements with their inherent risk/cost of miscomprehension, are both readily produced authentically and frequently are figurative. We can thus move toward a solution to these two problems by studying gratitude acknowledgements with an elicitation/production task designed to maximize authenticity. Let's turn now to a deeper consideration of gratitude acknowledgements.

4. Gratitude acknowledgements

To first demonstrate gratitude acknowledgements, consider the following scenario:

> Marina and Samar are both English majors at a university. They are working in their dorm's study hall one evening on an important short paper due the following day. Marina has nearly completed her paper. Samar is just getting started. Samar normally writes his papers on a tablet with an attached, inexpensive aftermarket keyboard. Very soon after Samar starts typing, his keyboard cracks in the middle and he cannot get it to work. Marina, who uses a laptop for writing, recognizes Samar's dilemma and offers to let him use her laptop since she has just completed her work. Samar heartily accepts. Later that evening, when Samar finishes working, he returns the laptop to Marina, who is still in the study hall reading a book, and thanks her. For Marina to say nothing in response to Samar's gratitude would most likely be taken as unusual. So some response is expected on her part. Marina is now in the position of using a gratitude acknowledgment.

A variety of broadly used verbal comments are available to Marina in this context. For instance, the most common token of gratitude acknowledgment used by

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English speakers in North America would probably be "you're welcome" or some variant. Other expressions also commonly found in such situations are "don't worry about it", "no problem", "no worries", "no biggie", "it's fine", "that's all right", "sure thing", "never mind", "whenever you need a favor", "anytime", etc.[4]

One may next note though that, despite their fairly conventionalized nature, these commonly used utterances appear to fall naturally along a continuum of figurativeness, from less-to-more respectively – an observation empirically verified by native speaker ratings (Colston, 2002b). At one extreme are comments which, although somewhat underspecified, are primarily nonfigurative in that the said meanings (e.g., "don't worry about it", "don't mention it", "no problem", etc.) are fairly consistent with the speaker's intended meaning – essentially that the other person needn't worry about nor express their gratitude, that the particular favor granted or gift given by the speaker was not unduly imposing on the speaker, etc. For instance, had Marina in the example replied, "don't worry about it", (note the directive, said meaning), she likely would have earnestly meant to tell Samar to not be concerned about thanking her for granting the particular favor in the context.[5]

At the other extreme of the continuum are more figurative utterances in which the said meanings of some words (e.g., "*anytime*", "*anything* you need", "*whenever* you need a favor", etc.) may not be generally consistent with the speaker's intended meaning but instead hyperbolize, typically through the use of extreme case formulations (Edwards, 2000; Pomerantz, 1986). The speaker's intended meaning with these utterances might be a reasonable willingness to assist the addressee again in similar future situations, yet the said meanings exaggerate this willingness. The comments typically have said meanings indicating that *all* similar future favors would be granted by the speaker. For instance, had Marina instead responded, "Oh, anytime", (note the hyperbolic, said meaning) she probably would mean she is reasonably willing to help Samar out *occasionally* in the future, but she would not have earnestly meant she would let Samar use her laptop at absolutely *any time*.[6]

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4. These comments also commonly occur along with, or as answers to, requests and may perform similar functions in those situations.

5. Of course the speaker could be authorizing meaningful inferences on the hearer's part, perhaps in a Gricean or Relevance Theoretic sense, to flesh out the interpreted meaning (e.g., the *reason* the hearer should not be concerned about thanking the speaker is because the speaker does not feel she is owed anything, because the favor granted was too minor to warrant compensation). But this does not make the utterance figurative. It is just underspecified in the normal nature of most language.

6. The fact that the utterance "your welcome" seems to lie at the midpoint of this continuum – neither specific to the present context nor clearly oriented toward future favors – may underlie

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Even though some gratitude acknowledgements are thus technically figurative, given they're also common and conventional one might wonder if they actually present any unusual risk/cost of being misunderstood. Put differently, is there a need to account for misinterpretation risk/cost by dissecting the pragmatic functions of figurative gratitude acknowledgements? To answer, consider how contexts in which these figurative gratitude acknowledgements are used might make their misinterpretation both likely and a potentially severe problem for speakers. These situations are typically ones where a speaker has just done a favor for a person, who has in turn thanked the speaker, so that now the speaker must respond. As demonstrated above, the set of responses at the more figurative end of the continuum have said meanings going beyond the speaker's intentions. The meanings essentially extend the current favor to *any* time, place, situation, etc., in the future. An interpreter might then be tempted to take that incorrect nonfigurative interpretation in order to repeatedly reap the advantages of such an open-ended future favor offer. Thus, if these expressions are taken nonfiguratively, the speaker would find herself in a position of being asked to repeatedly grant a favor, one she has at least semantically said she *would* grant, yet that she is not truly willing *to* grant.

To demonstrate, return again to the example story where Marina uses the gratitude acknowledgment "Oh, anytime", to express she didn't mind helping Samar out this once, or even that she is *generally* willing to help Samar again in the future. If Samar interprets the comment non-figuratively – that Marina is willing to help him *any time* or virtually any time he wants – Marina would be in a very difficult position. She is on record having directly said she would let Samar use her laptop "anytime". Yet she would not be truly willing to do this. To correct Samar's misinterpretation would likely be awkward, uncomfortable and might jeopardize their relationship. Such a correction might also feel like a retraction of an offer. On the other hand, if Marina does not correct the interpretation, she is stuck having to repeatedly grant favors, at great inconvenience and imposition on her, that she doesn't truly wish to grant. So it appears gratitude acknowledgements can be figurative and accordingly, given the delicate contexts of their use, might require explication of the pragmatic effects they trigger to warrant their common usage.

We can now pose the question of, *why don't people say what they mean*, specifically for gratitude acknowledgements. This question is best addressed by dividing it into two smaller questions; (1) what pragmatic functions might a speaker leverage to offset the risk of causing a difficult situation for herself and her interlocutor

its prevalence. It may be capable of accomplishing the goals of the utterances at both extremes of the continuum. Its ambiguity with respect to the extreme ends of the continuum may also hold value for speakers and thus increase its likelihood of use.

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by using a figurative gratitude acknowledgment, and, (2) what mechanisms might underlie the performance of those pragmatic functions?

Considering the benefits first, if one recalls the semantic meanings of the more figurative gratitude acknowledgements, a potential answer emerges. These comments, again, seem to semantically mean something like all similar favors would be granted by the speaker for the addressee in the future. Expressing one is willing to grant all similar future favors for a person is a fairly strong indicator of one's niceness or politeness, could be used to indicate one's respect or esteem for the other person, or could demonstrate one's feelings of attraction or fondness for the addressee.

The mechanism underlying these pragmatic effects might be something like the following. If person X were to grant a huge favor for person Y during all the occasions in the future in which the opportunity arose, it is likely that X is very polite and/or feels much esteem or fondness toward Y. Such a sacrifice is unusual and would be unlikely unless X felt these ways (or unless some other motivation existed – for instance that X loved Y – which would not be inconsistent with politeness, esteem, fondness, etc.). Thus, in *saying* one is willing to grant all similar future favors, one is essentially *expressing* he is polite, that he has much esteem for, or feels much fondness toward, the addressee.

But why doesn't a speaker express politeness, esteem, or fondness with more nonfigurative future favor offerings which do not pose such a high risk of misinterpretation with accompanying negative consequences? The answer is it simply may not be possible or would at least be very difficult. These politeness, esteem and fondness functions may not get expressed if a person attempts to more directly express the actual conditions under which she would be willing to grant future favors – essentially by speaking less figuratively.[7]

The situation is analogous to gift giving. Presents offered freely and openly may be seen as superior to presents offered with strict usage conditions. The qualifications detract from the gift. Similarly, future favor offerings (the typical form of the figurative gratitude acknowledgements) which are qualified somehow, by essentially making them more direct (e.g., "most times", "whenever I'm free", "if I'm not using it", etc.) may convey less of an offer and therefore express less politeness, esteem, fondness, etc.

7. It is also possible that an hyperbolized future favor offer is just easier or more convenient to construct – the speaker needn't compute the fine-grained details under which future favors may or may not be offered. A broad, hyperbolic remark just covers all the bases. Relatedly, erring on the side of hyperbole, even with a potential for misunderstanding, may be less risky than erring on the side of specifying conditions. The latter might be more likely to go awry.

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So, speakers may use figurative gratitude acknowledgements – essentially, comments conveying a speaker's willingness to grant all similar favors in the future (e.g., "anytime", "anything you need", etc.) – to express their politeness, esteem, fondness, etc. toward the addressee. These expressed meanings would be difficult to achieve were the comments made more direct to avoid potential misinterpretation (e.g., by saying, "anytime *that I'm not busy*…", "whenever you need it *if I'm not using it*…", etc.). Since nonfigurative gratitude acknowledgements (e.g., "don't worry about it") do not offer to grant all future similar favors, the functions of politeness, esteem and fondness expression would be performed to a lesser degree by those acknowledgements.

5. Summary

To summarize, the two problems concerning recent figurative language usage research involve an unrepresentative sample of figurative types being used in the research, and reasonably questionable ecological validity in the reliance on fully artificial experimental comprehension tasks. These problems can be addressed, though, with one solution. Routine formulas, given their prevalence and conventionality, are fairly easy to elicit authentically in production tasks, and are frequently figurative. It would thus be straightforward to collect genuine, realistic productions from people, when placed experimentally in different situations, and then evaluate the nature of the ensuing authentic productions. This way the ecological validity problem is addressed, and the work is conducted on the lesser-studied formulaic figurative type.[8]

Gratitude acknowledgements are an interesting specimen because of their conventional nature and risk/cost of miscomprehension. They should perform various pragmatic functions like fondness or esteem expression – because of their use of hyperbole in talking about future favors – which aren't as easily accomplished with more literal types.

In the following three experiments, this hypothesis was put to test. The first experiment sought to establish if the range of figurativeness of gratitude acknowledgements affects the degree of politeness expressed by a speaker. The second

8. The present study thus provides a markedly different approach to studying gratitude acknowledgements as that conducted by Colston (2002a) – which used experimenter prepared examples of gratitude acknowledgements that varied according to their figurativity, for participants to rate. The present study derives its experimental items from participants themselves, and then has different participants assess the items' degree of figurativity – effectively reversing the paradigm used by Colston (2002a).

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experiment posed the same question for the pragmatic function of esteem expression. The last experiment presents a similar test for the function of demonstrating fondness toward an addressee. First, though, consider the production tasks designed to collect the authentic materials for the experiments.

6. Production tasks

Three production tasks were designed to collect reasonably authentic utterances of gratitude acknowledgements to be used in subsequent experiments. Participants in all three tasks were presented with short written stories placing the participants in situations where they had recently granted a favor to an addressee who has now thanked them. Participants were asked to consider first what they would actually say in response to the addressees' expression of gratitude, if actually placed in the described situations, and to then record that utterance verbatim, in writing.

6.1 Method

Other than one particular set of instructions which differed for participants in the three tasks, the methods were identical. For the first politeness production task, half the stories described the participant as wishing to express a lot of politeness to the addressee, the other half depicted the participant as wishing to express very little politeness to the addressee.[9] For the esteem production task, half the stories described the participant as having a lot of esteem for the addressee, the other half as having very little esteem for the addressee. In the final, fondness production task, half the stories described the participant as feeling very fond of the addressee, the other half as feeling very little fondness for the addressee.

6.2 Participants and design

Thirty-six undergraduates from a Midwestern U.S. university signed-up to participate for a course requirement. Twelve people served in each task. Nobody participated in more than one task and none of the production participants took part in the later rating experiments. All participants were native English speakers. One variable was manipulated in each task; the level of politeness described

9. Although the present study attempted to gather at least somewhat authentic kinds of gratitude acknowledgements by having people produce ones in imagined situations (the imagining part a concession to experimental control), it is recognized that people imagining what sorts of personality traits they might have in situations of such production is not absolutely naturalistic.

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as a characteristic of the participant's personality for the politeness production task, the level of esteem ("respect")[10] described as a characteristic of the participant's opinion of the addressee for the esteem production task, and the level of fondness described as being felt by the participant toward the addressee for the fondness production task. Participants received only one level of their particular independent variable, making each task a simple one factor, between-participants design. This design was selected to enhance the realism of the task – so that the participants would not have to switch in the midst of the task to having a different level of politeness in their personality, esteem in their opinion, or fondness in their feelings, for addressees.

6.3 Materials

In all tasks, three stories described situations containing at least two people with one person (the participant) doing a favor for another person, who then thanked the participant. The stories were as follows,

> Your friend Sasha is struggling with her math class. You took the same course a year ago and did fairly well, so you are relatively good at this area of math. Sasha asks if you will help her out. You sit down with her and help her work through the problems. You spend about two hours with her. When you are both finished and are getting up, Sasha says to you, "Hey thanks a lot, I couldn't have figured this out without you." You reply,
>
> You are working at a coffee shop during the day, as you go to college at night. You live some distance from the shop and school, so you drive a car. A co-worker of yours, Carl, usually rides his bicycle to and from the coffee shop. One day though, while both you and Carl are at work, his bike is stolen. Now he can't get home. You offer to drive him home, even though it might make you late for class. When you drop him off, he says to you, "Hey, thanks, I appreciate the ride." You reply,
>
> You live with two other people, Marci and Dan. You have a really cool old leather "bomber" jacket. One day, Dan asks if he can borrow your jacket. He is going to a party and likes the look of the jacket. You lend it to him. Later that night, he returns the jacket to you and says, "Thanks for letting me wear this." You reply,

Each story was preceded by a description of the participant's personality, opinion or feelings regarding the task in question – politeness, esteem or fondness. In the politeness production task, for half of the participants the descriptions depicted the participants as being direct but not overly polite. For the other half of the

10. The term "respect" was chosen over "esteem" because it was thought participants would find the term a clearer indication of the speaker's intention.

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participants, the descriptions depicted the participants as being extremely courteous. Both descriptions were written to give the politeness level a somewhat positive image (e.g., being "direct" rather than rude), and both contained an additional statement to describe the participant as being outgoing. These latter two characteristics were incorporated to discourage overly negative or curt responses, to lend credence to the negative personality characteristic (e.g., to justify why an impolite person would do the favor in the first place) and to keep the personalities as similar as possible except for the degree of politeness. The statements were as follows,

> You are an incredibly direct person who is never extremely polite when you speak with other people. You are also very outgoing and always willing to talk with other people.
>
> You are an incredibly polite person who is always extremely courteous when you speak with other people. You are also very outgoing and always willing to talk with other people.

In the esteem production task, for half of the participants, the descriptions depicted the participants as having a very little respect for their addressee. For the other half of the participants, the descriptions depicted the participants as having a lot of respect for their addressee. Both descriptions contained an additional statement to describe the participant as being outgoing. This characteristic again was incorporated to discourage overly curt responses, to lend credence to the negative personality characteristic vis a vis the favor that had been granted (e.g., why would a person do a favor for someone they hold in low esteem) and to keep the personalities as similar as possible except for the degree of esteem. The statements were as follows,

> You have a tremendous amount of disrespect for the person you are speaking with in this situation. You are also very outgoing and always willing to talk with other people.
>
> You have a tremendous amount of respect for the person you are speaking with in this situation. You are also very outgoing and always willing to talk with other people.

In the fondness production task, half the participants received descriptions of the participants as not being very fond of their addressee. For the other half of the participants, the descriptions had the participants as very fond of their addressee. As before, both descriptions contained an additional statement to describe the participant as outgoing, once again to discourage overly curt responses, to give credence to a person feeling little fondness for another person yet doing them a favor (e.g., why one person who isn't fond of another person, would do that other

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person a favor) and to keep the personalities as similar as possible except for the degree of fondness. The statements were as follows,

> You are not fond at all of the person you are speaking with in this situation. You are also very outgoing and always willing to talk with other people.
>
> You are incredibly fond of the person you are speaking with in this situation. You are also very outgoing and always willing to talk with other people.

For all tasks, each story was printed on a separate page and was bound in a booklet with the order of pages being random. Beneath each story was blank space to allow participants to write their responses.

Procedure

Participants were told they would complete a task involving what people say in different situations. Participants were then presented with the booklet with instructions on the cover. The instructions told participants to:

> …read [each] description carefully, and imagine you are actually in this situation. You are in the exact location, you are meeting with the exact people described, you have the personality the description says you have, etc. After you have carefully imagined yourself in the situation, think about *what you would actually say* in the situation. What exact words would you use? Once you have imagined this, then please write down what you would say, verbatim, in the space provided.

Participants followed along as these instructions were read aloud by the experimenter. The experimenter answered any questions, and then emphasized participants were to realistically imagine themselves speaking aloud the utterance they would actually say in a given situation *before* writing the response down. This instruction was designed to allow capture, as realistically as possible, of the actual utterance that participants would naturally use in each situation. Otherwise participants might have composed their responses during the writing of the comments and edited/revised the responses during this process. When finished with the three stories, participants were debriefed and dismissed.

7. Results

Since the responses to these tasks were collected for use as stimuli for the experiments, no statistical analyses were conducted. The verbatim responses written by participants, with minor spelling errors corrected, are presented in Tables 1–3, which appear below with each experiment. Experiment 1 presented the responses

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given by the 12 participants in the politeness production task (each participant provided 3 responses, one for each story, resulting in 36 utterances – 18 from "polite" speakers, 18 from "impolite" speakers). Experiment 2 then presented the responses from the 12 esteem production task participants, and Experiment 3 presented responses from the 12 fondness production task participants. All three experiments delivered their items to a new set of participants who were asked to rate the figurativeness[11] of the responses.

8. Experiment 1: Figurativity and politeness expression in gratitude acknowledgements

This experiment tested the hypothesis that the range of figurativity of gratitude acknowledgements predicts the level of politeness expressed by speakers who use the acknowledgements. Participants were presented with the 36 verbatim acknowledgements from the politeness production task and were asked to consider how figurative the responses were.

8.1 Participants and design

Eighteen undergraduates from a Midwestern U.S. university participated for a course requirement. None of the participants took part in the other experiments or the production tasks. All were native English speakers. One variable was manipulated in this experiment; the level of politeness under which speakers of the items had been motivated to produce the gratitude acknowledgements used in this experiment. Participants received both levels of this independent variable making a simple one factor, within-participants design. Considering items as a random factor, the design is also one factor, within-participants.

8.2 Materials

The 36 verbatim responses and the 3 stories used to solicit those responses from the politeness production task were used in the present experiment (see Table 1).

11. Technically, the participants were directed to rate the degree to which the meaning really intended by the speaker of the utterance differed from the utterance's "literal" meaning but the term "figurative" is used here to coincide with the consideration of figurativity found throughout the chapter.

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Table 1. Verbatim gratitude acknowledgements produced under low and high politeness motivation

Low politeness motivation
I took this class. It'll get easier as you go along through it.
It's no problem. Just try to make sure you have a way back and forth from now on because I have class. I'll be late.
Sure, no problem. How was the party?
No problem, see you later.
No problem. I can give you a ride on the days I don't have class if you need me to. Just let me know. Here is my number.
You're welcome. Did you have fun?
No problem, I never make it to class on time anyway.
Well, don't think that the ride was free, it's going to cost you.
No problem, anytime.
No problem, just remember that you owe me one. And next time lock up your bike.
Sure, I hope nothing bad happened to it.
Don't think it's going to happen again. I'm not nice all the time.
It's all good. At least you brought it back in one piece.
I'm glad that you enjoyed wearing my jacket. If you like it so much, go buy your own.
I know, I'm good that way.
Well, a nice dinner and a movie and we'll consider it even. On you of course.
I'm glad I could help.
Yeah, no problem. Maybe if you paid some attention in your class you would understand the material.
High politeness motivation
Yeah, no problem. I know how hard math can be. If you have any more problems, don't be afraid to ask.
Sure, no problem. If you ever need another ride, just tell me.
Sure, you're welcome. If you ever want to borrow anything from me just ask and I'll be more than willing.
You're welcome. I completely understand how hard it can be at times. Just call me if you need more help.
No problem. Let me know if you need any more help. When I'm free next week, we could get together.
Sure, there better not be any marks on it as I inspect it up and down.
You're welcome, no problem at all. Call me if you need a ride tomorrow.

(*Continued*)

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Table 1. (*Continued*)

You're welcome. I need to run to get to class. Have a good night.
No problem! You have a nice day! But remember, I have to go to class so I'll see you later. Hope you get your bike back!
No problem Carl. I'm sorry about your bike. Let me know if you need a ride tomorrow.
You're welcome. Anytime.
You're welcome. Thanks for returning it so promptly.
Yup! No sweat as long as you don't mess it up it's all good.
Anytime, Dan. The jacket looks good on you.
You're welcome. I'm always willing to help if I can. If you have any other problems, just let me know.
No problem. We all need to help each other to get through our education. Maybe you can return the favor sometime.
It was my pleasure. Anyways, it also helped me out. Refresh on old stuff. And besides, this class is difficult.
It's the least I could have done. I hope that it helps you and you do well on your next test.

The responses were divided into three sets according to the story under which each response was made. The particular story and the responses given for that story were printed on a separate page from the other stories/responses, with the story printed at the top of the page. The responses made under low and high politeness motivation conditions were randomly mixed and were printed beneath each story. Each response was presented with a 7-point rating scale ranging from "no difference" (coded as 1) to "very big difference" (coded as 7).

8.3 Procedure

Participants were told they would complete a task involving what people say in different situations. Participants were then presented with the booklet with instructions on the cover. The instructions told participants to, "decide how much of a difference there is in what a person literally says versus what he or she really means." Further instructions specifically asked participants to,

> …read the speaker's comment [and] first think carefully about what the speaker means. In other words, what is the meaning that the speaker is really trying to get across. Then, think about the literal meaning of the exact words the speaker uses. What do these words mean? Then, decide if there is a difference between these meanings, and if so, how big that difference is.

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Participants were then instructed to mark the rating scales to indicate their opinions. Participants were also told they could imagine the tone of voice of the speakers if that helped with the ratings.

Participants followed along as these instructions were read aloud by the experimenter. The experimenter then answered any questions. When finished, participants were debriefed and dismissed.

8.4 Results and discussion

A brief comment on the data analysis and reporting is in order. Analyses of variance (ANOVAs) in all experiments were conducted in two ways – one treating participants as the random factor and the other treating items as the random factor. Conducting analyses this way allows for generalization of significant effects across both participant and item populations. ANOVAs treating participants as the random factor are referred to with *F*1 and analyses treating items as the random factor are referred to with *F*2.

The mean ratings for the two kinds of gratitude acknowledgements in the present experiment are presented in Figure 1. A one-way repeated measures ANOVA with gratitude acknowledgment type (low politeness motivation vs. high politeness motivation) as the factor revealed a significant difference in the degree to which participants thought the acknowledgements were nonliteral, $F1(1, 17) = 19.30$, $p < .001$, $F2(1, 35) = 3.10$, $p < .10$. High politeness motivation acknowledgements were judged to be more nonliteral (M = 3.58) than low politeness motivation acknowledgements (M = 2.93).

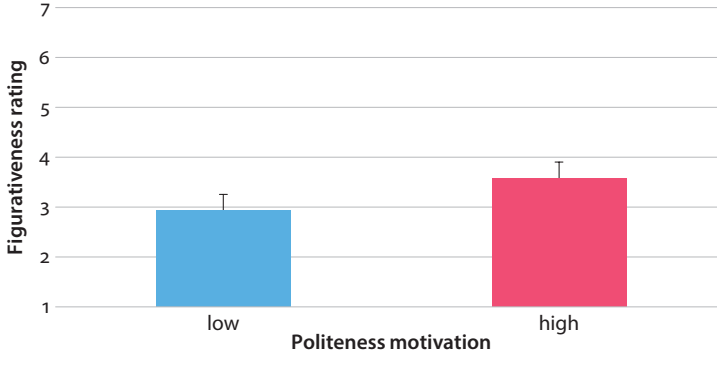


Figure 1. Rated figurativeness of gratitude acknowledgements produced to express low and high politeness (Note: Error bars represent standard error of means)

These results support the hypothesis that the greater the figurativity of gratitude acknowledgements, the greater the expression of politeness. Speakers who are polite produce gratitude acknowledgements are rated as significantly more figurative than

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speakers who are not polite. It thus appears that the nature of the figurativity of figurative gratitude acknowledgements – typically a hyperbolic promise to grant all similar favors in the future – serves to express a speaker's politeness.

The next experiment investigated if another purpose of using figurative gratitude acknowledgements is to express one's esteem toward an addressee.

9. Experiment 2: Figurativity and esteem expression in gratitude acknowledgements

This experiment tested the hypothesis that the range of figurativity of gratitude acknowledgements predicts the level of esteem expressed by speakers who use the acknowledgements. Participants were presented with the verbatim acknowledgements from the esteem production task and were asked to consider how figurative the responses were.

9.1 Participants and design

Eighteen undergraduates from a Midwestern U.S. university participated for a course requirement. None of the participants took part in the other experiments or the production tasks. All were native English speakers. The level of esteem with which speakers had been motivated to produce the gratitude acknowledgements used in this experiment was the one manipulated variable. Participants received both levels of this independent variable making a simple one factor, within-participants design. The design is also one factor, within-participants, when considering items as a random factor.

9.2 Materials

The 36 verbatim responses and the 3 stories used to solicit those responses from the esteem production task were used in the present experiment (see Table 2).

Table 2. Verbatim gratitude acknowledgements produced under low and high esteem motivation

Low esteem motivation
You're welcome, I love math. Sometimes I find myself doing it in my sleep. You should go to your instructor if you need help. I'll be around if you still need help if I'm not extremely busy O.K.
You're welcome. I hope you find or get your bike back. I'll see you next time. Have a nice night.
You're welcome, no problem. But don't get used to it kid. Did you have a good time at the party? Did you see anyone worthwhile? Well, I'm going to bed. Good night.

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Table 2. (*Continued*)

So how did it go? Was the party fun and did anyone like the coat?
No problem.
You're welcome.
You're welcome.
Do you know how late I'm going to be, this totally screwed up my schedule. You should have been more responsible with your damn bike.
No problem, dude, let me know if I can help in the future.
No problem. I'll see you tomorrow at work. I hope you find your bike.
You're welcome.
No problem. But I'm sure it reeks of your body.
It's cool dude, glad you liked it.
You're welcome
You're welcome.
Well hello. Thanks for the waste of my time. Like I don't have any to waste.
Yeah, you could have. Hang in there girl, it gets easier the more you practice.
No problem, you're welcome. If you ever need any help with your math, just ask me.
High esteem motivation
No problem, hope you get your bike back.
You are welcome. See you tomorrow.
No problem. I'm glad to be able to help.
Hey! No problem. Take it easy!
Sure, you're welcome.
You are welcome.
I'm glad I could help you. Did you have a good time?
Don't mention it. Hope you had fun!
Well, I hope I helped.
You're welcome, anytime.
It's no problem. I am happy to help you anytime. Just give me a call.
Forget about it! I appreciate when people help me.
No problem. I'm glad you liked it. Feel free to borrow other things you like.
Don't worry about it. If you have any more problems just come and find me.
Sure, no problem.
No problem. I understand your circumstance. I'm glad I could help out.
No problem. I'm sure you would have done the same for me.
You're welcome. I'm glad I could help you out. Anytime you need help just let me know.

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The preparation and presentation of materials was the same as that for Experiment 1.

9.3 Procedure

The procedure was identical to that used in Experiment 1. When finished, participants were debriefed and dismissed.

9.4 Results and discussion

The mean ratings for the two kinds of gratitude acknowledgements are presented in Figure 2. A one-way repeated measures ANOVA with gratitude acknowledgment type (low esteem motivation vs. high esteem motivation) as the factor revealed a significant difference in the degree to which participants thought the acknowledgements were figurative, $F1(1, 17) = 10.40$, $p < .01$, $F2(1, 35) = 3.03$, $p < .10$. High esteem motivation acknowledgements were judged to be more figurative (M = 3.62) than low esteem motivation acknowledgements (M = 2.95).

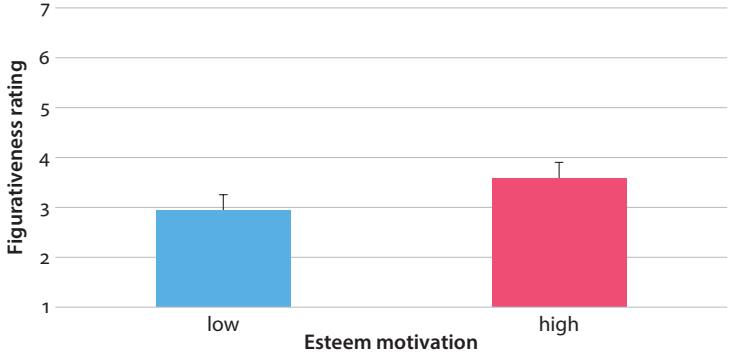


Figure 2. Rated figurativeness of gratitude acknowledgements produced to express low and high esteem (Note: Error bars represent standard error of means).

These results support the hypothesis that the greater the figurativity of gratitude acknowledgements, the greater the expression of esteem. Participants who do hold their addressee in high esteem produce gratitude acknowledgements that are significantly more figurative than participants who do not hold their addressee in high esteem. It thus also appears that the nature of the figurativity of figurative gratitude acknowledgements – again, typically a hyperbolic promise to grant all similar favors in the future – also serves to express a speaker's esteem for the addressee.

The final experiment was conducted to investigate if a third potential purpose of using figurative gratitude acknowledgements is to express one's fondness toward an addressee.

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10. Experiment 3: Figurativity and fondness expression in gratitude acknowledgements

This experiment tested the hypothesis that the range of figurativity of gratitude acknowledgements predicts the level of fondness expressed by speakers who use the acknowledgements. Participants were presented with the verbatim acknowledgements from the fondness production task and were asked to consider how figurative these responses were.

10.1 Participants and design

Eighteen undergraduates from a Midwestern U.S. university participated for a course requirement. None of the participants took part in the other experiments or the production tasks. All were native English speakers. One variable was manipulated in this experiment; the level of fondness with which speakers had been motivated to produce the gratitude acknowledgements used in this experiment. Participants received both levels of this independent variable making a simple one factor, within-participants design. Considering items as a random factor, the design is also one factor, within-participants.

10.2 Materials

The 36 verbatim responses and the 3 stories used to solicit those responses from the fondness production task were used in the present experiment (see Table 3).

Table 3. Verbatim gratitude acknowledgements produced under low and high fondness motivation

Low fondness motivation
No problem.
No problem.
Sure, no problem. I'm really sorry about your bike. I hope you get it back.
No problem, see you tomorrow at work.
Sure, if you need it again let me know. I'm glad that you liked it.
No problem.
You're welcome, always willing to help others.
No problem, hope everything turns out alright for you.
No problem.
You're welcome. I hope you find your bike. I will see you at work tomorrow.

(*Continued*)

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Table 3. (*Continued*)

You're welcome, don't make it a habit.
You're welcome, please put back where you got it.
You're welcome, you're lucky I lent it to you as I do not like other people wearing my clothes.
Yeah, next time you need to find your own jacket.
Yeah well, I try to help those who need my help the most.
It was nothing really. It's just some people get it and others don't.
Oh, you're welcome.
No problem, well, I have to go now. See you tomorrow.
High fondness motivation
I'm here for ya babe.
Sure, no problem. I hope your math class goes well. If you need any more help, just ask.
Oh sure, no problem. Sorry about your bike being stolen. I'll talk to you later, I have to get to class now.
Hey, I'm glad I helped you out. If you need help again, let me know.
Sure, no problem. I hope you had a good time. Anytime you need it again just ask.
You're welcome, glad I could help.
It was no problem. I am happy I could help. If you need anything else just let me know.
Don't worry about it. Hey, if you need a ride to work tomorrow just give me a call. I'm real sorry your bike got stole. Maybe it's just fate bringing us together.
Hey, no problem, anytime! Let me know what happens with your bike. I hope you find it.
You're welcome, anytime.
No problem, did you have a good time?
No problem. You look almost as good in it as I do.
You're welcome. How did everybody like you in it? I'm sure good.
No problem.
It was no problem! Let me know if you need more help. You know where you can find me.
Hey, let's make a deal. If you get an A on your exam, you let me take you out to dinner. If you don't get an A, I will just have to see you twice as much to help you study.
It was no problem. Let me know if you need any more help okay?
No problem. How is your history?

The preparation and presentation of materials was the same as that for the other experiments.

10.3 Procedure

The procedure was identical to that used in the other experiments. When finished, participants were debriefed and dismissed.

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10.4 Results and discussion

The mean ratings for the two kinds of gratitude acknowledgements are presented in Figure 3. A one-way repeated measures ANOVA with gratitude acknowledgment type (low fondness motivation vs. high fondness motivation) as the factor revealed a significant difference in the degree to which participants thought the acknowledgements were figurative, $F1(1, 17) = 32.96$, $p < .001$, $F2(1, 35) = 20.69$, $p < .001$. High fondness motivation acknowledgements were judged to be more figurative (M = 4.44) than low fondness motivation acknowledgements (M = 3.56).

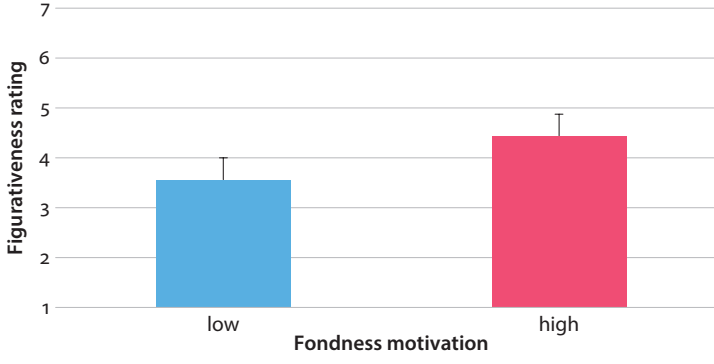


Figure 3. Rated figurativeness of gratitude acknowledgements produced to express low and high fondness (Note: Error bars represent standard error of means).

These results also support the hypothesis that the greater the figurativity of gratitude acknowledgements, the greater the expression of fondness. Speakers who are fond of their addressee produce gratitude acknowledgements significantly more figurative than speakers who are not fond of their addressee. It thus appears that the nature of the figurativity of figurative gratitude acknowledgements – once again, a hyperbolic promise to grant all similar favors in the future – also serves to express a speaker's fondness.

11. General discussion

The motivation for the current study was to address two problems in the recent literature on why people don't say what they mean – a possible underrepresentation in research studies of the full range of types of figurative language used in everyday talk, and a potential ecological validity reduction due to standard psycholinguistic experimental methodologies on figurative language using inauthentic language items in contrived comprehension tasks.

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The study faced these problems by investigating the pragmatic functions of a relatively unexplored, frequently figurative type – formulaic language, specifically, a type of routine formula known as gratitude acknowledgements. Gratitude acknowledgements lend themselves to easy realistic production and can thus allow investigation to take place on reasonably authentic language items.

We can now proceed with a discussion of three general issues – (1) what do we now know about the pragmatics of this type of figurative language (e.g., what are its functions, what processes might underlie their performance, etc.), (2) how might this new knowledge inform theoretical discussion of figurative language usage, and (3) how does the inclusion of this category into the investigation of the pragmatics of figurative language, as well as the use of authentic items such as those utilized in this work, advance our attempt to answer the overall guiding question in this research on *why people don't say what they mean*?

12. Pragmatics of gratitude acknowledgements

Concerning the pragmatics of gratitude acknowledgements, to first briefly summarize the results, gratitude acknowledgements produced by people placed in situations where they are polite, where they hold their addressee in high esteem, or where they feel fond of their addressee are rated as being significantly more figurative than gratitude acknowledgements produced by speakers in situations where they are not polite, do not hold their addressee in high esteem, or do not feel fond of their addressee. So it seems that speakers use figurative gratitude acknowledgements, with the figurativeness typically comprised of a hyperbolic future favor offer, to express politeness, esteem and fondness.

We can now discuss a range of questions. Why are fondness, esteem, politeness, etc., the particular pragmatic functions sought-after with these utterances? Why not something else? Why do speakers use figurativity to perform these functions? Why not speak directly? Why is a hyperbolic future favor offer the typical form of this figurativity? We know, after all, that hyperbolic future favor offers pose a risk of miscomprehension that holds significant costs for the interlocutors (Colston, 2002b). Isn't some other form of figurativity available to achieve these pragmatic goals which might run a lesser risk of miscomprehension? What is the specific mechanism of this type of figurativity? Why is that the mechanism used and not some other?

The general answer to these questions is the form of figurativeness used in these gratitude acknowledgements – hyperbolic future favor offers, supplies the best *all-around* mechanism – display of willingness to sacrifice and/or trust in the addressee, in the midst of a conversation about favors, to express the most likely

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relevant feeling variables by speakers in gratitude acknowledgment situations – fondness, esteem, politeness, etc.

Consider the feelings first. In a situation where a person is in the position of using a gratitude acknowledgment, the person has, by definition, just granted a favor for someone else. The mere nature of this situation suggests the person who granted the favor could be either, (1) very courteous, (2) feels very positively (e.g., fondness, esteem, etc.) toward the other person, or perhaps, (3) owed the other person a favor, or (4) granted the favor out of the situation's necessity, despite what the granter feels about the other person. It thus seems possible that situations in which gratitude acknowledgements are used are the very ones in which speakers *could* feel fondness, politeness or other positive feelings toward their addressee, but also may *not* hold those feelings.

Next, given that speakers in gratitude acknowledgment situations could feel fondness or are polite, etc., but also would not *necessarily* have those characteristics, they would likely seek to express their position. Although it is true that situations exist in which people would not want to express themselves (e.g., the speaker is shy, the situation could be embarrassing, etc.), no particular reason is supplied in the gratitude acknowledgment situations discussed here to produce such expressive reluctance. Moreover, given the distinct range of possible motivations for granting the favor, people might feel particularly motivated to make their position clear. So, the speaker feels positively toward the addressee and/or is polite, etc., or the speaker does not have those characteristics, and wishes to express their stance.

So why then use figurativity for an expression of positivity as currently defined? Why doesn't the speaker just directly say, "I am fond of you", "I have a lot of respect for you", etc.? One straightforward answer is that such comments might just be taken as odd (i.e., someone saying, "I'm being polite/I want to be polite to you"). Another answer is that these particular feelings are often not well served if strongly displayed prematurely. If such feelings are not yet fully mutual, an overt display of fondness can discourage development in a personal relationship. Unabashed early displays of affection, respect, etc., can also signal a lack of social control or maturity which can also hinder relationship development (Colston, in press). On the other hand, failure to communicate one's positive feelings can also reduce the likelihood of increased intimacy. So some middle ground of partial or disguised fondness display is often most successful, and figurative language serves this process well.

But why is a hyperbolic future favor offer then used as the form of the figurativity when the positive feelings/personality characteristics are present? One likely reason here is the relevance of favors as a conversational topic (Blakemore, 1987; Carston, 2002; Sperber & Wilson, 1986b; 1987; 1995; Wilson & Sperber, 2012). It

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might be considered unusual to change the topic of the conversation from favors to the speaker's feelings toward the addressee. Such an abrupt switch might violate rules of conversation (Grice, 1975). Or again, it could signal too early the speaker's feeling of positivity and thus backfire on the speaker. A better strategy might be to continue in the vein of the current conversation, whose topic is the speaker's original favor, and use that trend to accomplish the pragmatic functions via some figurative means.

Lastly, what is the mechanism through which hyperbolic future favor offers achieve politeness, esteem, fondness, etc., expression? The answer here is most likely a demonstration of trust and/or willingness to sacrifice. This mechanism is likely dependent upon exaggerated, open-ended future favor offerings.

To demonstrate this mechanism, consider first the issue of interpretive choice and advantage-taking. It may not always be the case that interpreters take *either* the nonfigurative *or* the intended meaning of a gratitude acknowledgment. It is possible that interpreters recognize *both* kinds of meaning at some level and then choose one or even switch between them to suit the interpreters' needs. For instance, Samar from the example in the introduction could have understood Marina's, "Oh, anytime", acknowledgment as it was intended – as a statement of *reasonable* willingness to assist again in the future. Samar may have also understood the expression of politeness/esteem/fondness as the current results have shown. But Samar could also have recognized or switched to the more nonfigurative interpretation, either earnestly or as a pretense, to leverage an advantage for himself. This advantage also need not necessarily be limited to using the computer whenever he wants in the future. It could also be gaining or maintaining a degree of power over, or obligation from, Marina. If Samar embraces Marina's nonfigurative meaning and accordingly attempts to borrow the computer again, and Marina is forced to "retract" this nonfigurative offer, she may feel beholden to Samar either for the retraction or for the misunderstanding, and Samar might gain from this.

A speaker is thus inherently displaying trust in their addressee when they use a figurative gratitude acknowledgement. Given the risk and cost of misinterpretation and/or interpretive-switching/advantage-taking, speakers must place a fair amount of trust in their addressee to not take the remarks in ways not intended but nevertheless viable. A speaker stands to lose if a figurative gratitude acknowledgment is taken nonfiguratively or if the addressee refers to the nonfigurative offer to point out the speaker's seeming insincerity.[12] Thus, the speaker must count on the addressee's cooperation in these exchanges. This expression of trust is also consistent with the pragmatic functions such remarks have been shown to perform.

12. A phenomenon referred to as "figurative outing" (Colston, 2015).

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Given the semantics of an open-ended future favor offer, a speaker is also inherently displaying willingness to sacrifice for the addressee. Volunteering to repeat a favor at all times in the future in which the opportunity arises would be a serious imposition on the speaker. Thus, his or her saying they'll do this shows their willingness to put themselves out for the addressee. This display of willingness to sacrifice is also consistent with the pragmatic functions of figurative gratitude acknowledgements.

To summarize thus far, speakers in gratitude acknowledgment situations potentially feel positively toward their addressee but, given the uncertainty of those positive feelings, wish to express how they feel. A positivity expression is well-served by figurative language because of the particular pragmatic effects being sought-after – the use of figurativity itself in this context produces pragmatic effects that align nicely with a positivity expression. Moreover, the relevance of favors as the conversational topic makes it a prime vehicle for continued conversation – hence a mentioning of something about future favors. Lastly, given the reference to future favors, the most ready means available to express the speaker's feelings would be to demonstrate trust and desire to sacrifice via an exaggeration of the actual degree of willingness to grant future favors. All told, these influences and constraints on the interlocutors and the conversation make gratitude acknowledgements, both figurative and nonfigurative, a useful vehicle for responding to expressions of gratitude.

To lend credence to this explanation, consider the actual tokens made by speakers in the production tasks. A perusal of the kinds of figurativity used in the acknowledgements speakers produced provides strong evidence for the role of hyperbolic future favor offers in positivity expression. Although a few of the acknowledgements are figurative in other ways (e.g., verbal irony – "Thanks for the waste of my time", rhetorical questions – "Do you know how late I'm going to be", metaphors – "On you of course", other kinds of hyperbole – "I never make it to class on time anyway", etc.), the majority of instances of figurativity are of this hyperbolic future favor offer sort. A rough approximation yielded five such instances in the low motivation conditions, and a total of 20 in the high motivation conditions (e.g., "No problem, *anytime*", "If you have *any* more problems…", "If you *ever* need *any* help…", "I am happy to help you *anytime*…", "*always* willing to help others…", "If you need *anything* else…" [emphases added]).

13. Theoretical approaches to figurative language usage: Politeness and constraint satisfaction

We may next discuss how this additional understanding of gratitude acknowledgements might inform theoretical approaches to the usage of figurative language.

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For brevity, this discussion will focus on just two possible approaches, Politeness Theory and Constraint Satisfaction.

13.1 Politeness Theory

Brown and Levinson's influential work on Politeness Theory (1987; 1999), bolstered by empirical evidence on people's use of metaphors, euphemisms, etc., claims that one reason people speak figuratively is for face management purposes. According to this view, people are motivated by two general face mechanisms – a desire to heighten one's positive face, and to lessen one's negative face. People heighten their positive face by revealing positive personal characteristics, beliefs, behaviors, etc., to other people. People lessen their negative face by minimizing the revelation of negative personal characteristics, etc. People also seek to act in ways that appropriately affect other people's faces.

People will thus speak in ways that seek to fulfill these two motivations for themselves and other people. If, for example, a negative event has occurred (e.g., a speaker became ill from bad food), the speaker can both heighten her positive face and lessen her negative face by avoiding direct negative language. She might thus use figurative forms, (e.g., metaphor, euphemism, negation, etc.) in discussing the negative event (e.g., "Leftover Chinese take-away is not my best friend") with an addressee. Or, if a speaker must deliver some negative information about another person to that other person (e.g., a boss must give a poor performance evaluation to an employee), the speaker can manage face by using figurativity (e.g., "It appears your work is a bit bland and could use some polishing"), which lessens negative face for both interlocutors and can heighten positive face for the speaker, relative to using more direct or nonfigurative language (Colston, 2015).

One particular negative characteristic of concern for face management applies to the gratitude acknowledgment situations in the present study – being beholden to others. Owing things to other people is a generally undesirable experience, and people seek to minimize it. So if a person owes something to a lender, that person is experiencing a negative face threat. Moreover, if you are the lender, you are part of the source of that indebted person's negative face threat. You may also experience a threat to negative face by being a cause of such a negative experience for another person. According to Politeness Theory, people would seek to lessen these threats to negative face in how they talk with one another.

One way for you as the speaker/favor-granter to lessen these threats of negative face would be to lessen the obligation the other person is experiencing. This might be readily accomplished by a number of mechanisms. You could remove the obligation, as in saying the person needn't pay you back (e.g., "You don't owe me anything…"). You could offset the obligation, perhaps by mentioning a past

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favor the addressee had done for you that obviates the payback (e.g., "Well, you helped me out last month…"). Or you could diminish the perceived magnitude of the required payback by reducing the perceived magnitude of the current original favor or gift you had originally granted. This could be accomplished by saying the original favor granted or gift given was inconsequential (e.g., "It was on my way…", "This was no problem…" etc.).

Politeness Theory might thus supply a ready general explanation for the results found in the current study. The situations used in the study essentially set up the negative face threats described above, and people may have just spoken accordingly as a means to lessen these threats. When speakers used gratitude acknowledgements such as, "no problem", "don't worry about it", etc., they were simply using the last of the solution mechanisms discussed above – diminishing the magnitude of the original favor to lessen the obligation.

But one must still explain how the variables employed in the study altered the kinds of gratitude acknowledgements speakers used. Again, people used a greater number of figurative gratitude acknowledgements in the high politeness/esteem/fondness conditions compared to the low politeness, etc. conditions. How can Politeness Theory explain this? One possibility is that the figurative gratitude acknowledgements reduced the magnitude of the original favors more than did the nonfigurative ones. This point was made in another study that investigated gratitude acknowledgements (Colston, 2002b):

> Arguably, the size of a favor granted by a speaker would be diminished more by [figurative] gratitude acknowledgements than by [nonfigurative] ones if they were used in response to the grantee's expression of gratitude. In lieu of other factors, if someone were willing to experience an imposition (e.g., grant a favor) repeatedly, that imposition would likely be less than were the person willing to experience that imposition only once. A speaker literally saying she would grant a favor again in the future, would thus likely express that the favor were less of an imposition compared to the speaker saying the favor granted just once was not a problem. Therefore, [figurative] gratitude acknowledgements should reduce the threat to negative face on the part of addressees more than [nonfigurative] gratitude acknowledgements…. (p. 209)

It thus appears Politeness Theory provides a straightforward account of the present findings. But upon closer observation some anomalies emerge. First, as was argued in Colston (2002b), although figurative gratitude acknowledgements may reduce negative face threat for speakers and make them seem more polite to observers, Politeness Theory has a more difficult time explaining how figurative gratitude acknowledgements allowed speakers to express high esteem:

> Politeness Theory is less clear, however, on the degree of esteem that would be expressed by [nonfigurative] and [figurative] gratitude acknowledgements. Although

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> it seems true that letting an addressee off the hook, so to speak, with a [figurative] gratitude acknowledgment – which again lessens the threat to negative face by downplaying the addressee's obligation – is a nice and polite thing to do. It is less clear that one could use this mechanism to state that one looks up to the addressee. Such a function is not necessarily inconsistent with politeness, but it does not as precisely follow from the reduction-to-negative-face-threat… It is thus not clear that Politeness Theory affords the best mechanism by which to predict all pragmatic functions of this form of [figurativity]. (p. 209)

The problem essentially is that a speaker feeling high esteem for another person may not be in a position to realize the potential negative face threat that the other person could experience as a result of being obligated to repay a favor from the speaker. When a person looks up to, greatly admires, holds in high esteem, etc., another person, the admirer often has a difficult time realizing the other person might feel a negative face threat from them. The target of the admiration is seen as having higher social status, and thus being immune to social concerns of people in lower positions. Indeed, admir*ers* are often motivated to maintain such grandiose, and very possibly inaccurate, "on-a-pedestal" images of their admir*ees* in part to offset the cognitive dissonance ensuing from the mere presence of the admiration (Colston, 2015). In other words, in order to justify one's admiration for another person, given that that admiration exists, it may be difficult to see the other person in anything other than a highly positive light. So, although speakers may use figurative gratitude acknowledgements because of the mechanisms discussed in the previous section (display of willingness to sacrifice, etc.), they may not be as driven by a desire to reduce a negative face threat.

Another problem with applying Politeness Theory to explain the full usage of figurative gratitude acknowledgements is that many of the actual figurative acknowledgements used by the speakers in the present study do not seem to mesh well with the mechanisms described above for reducing negative face threat from a favor payback obligation. These mechanisms, again – removing, offsetting, or diminishing the obligation, all apply to the present situation where an original favor was granted and now some degree of payback is expected. Or, in the case of offsetting the obligation, they point to some past favor.[13] Although most of the *nonfigurative* gratitude acknowledgements collected in the present study are oriented toward the current favor (e.g., "No problem" being one of the most frequent), most of the *figurative* ones are oriented toward *future* favors (e.g., "…If you

13. It is of course possible for an offsetting mechanism to also orient toward the future, as in saying, "But you'll be giving me a ride next week…", but this is a different type of future referral than that used by the hyperbolic future favor offer.

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ever need another…", "…If you have any more problems…", "…Anytime you need it again…", "…If you need anything else…", etc.).

If reducing the perceived magnitude of the payback by diminishing the magnitude of the *original favor* is the way negative face threat is lessened, then why this reference to future favors? The one mechanism discussed above concerning the degree of imposition does work here – a kind of favor that would be willingly and repeatedly granted would likely be a smaller infringement upon the granter than a favor that would not be repeated – but this future orientation seems a very complex and roundabout means to diminish a current favor's perceived magnitude. It would seem much easier to simply exaggerate the smallness of the imposition of the original favor (e.g., "There was absolutely no problem whatsoever with this", etc.). However, aside from a few common tokens (e.g., "Oh it was nothing"), of which, interestingly, none were found in the present study, this mechanism was rarely used. The only instances of this mechanism collected were, "No problem at all", and, "It's the least I could have done", both in the high politeness condition. These are also rather poor instantiations of this mechanism – the former is a fairly weak hyperbole (relative to the above hypothetical, "There was absolutely no problem whatsoever with this") and the latter is a fairly standard construction carrying its own set of pragmatic mechanisms including the door-in-the-face technique widely observed in social psychological studies (Colston & Demarias, 2002), and thus it's exaggeration of the smallness of the current favor could likely jut be an artifact of these other principles.[14]

So it would appear Politeness Theory cannot fully explain all the intricate nuance to the usage of nonfigurative and figurative gratitude acknowledgements. It certainly is effective in accounting for some degree of the motivation for using these forms, and without doubt a reduction to negative face threat affords one very powerful mechanism for why people would use figurative gratitude acknowledgements. But other mechanisms seem to play a role as well, including the

14. The Colston & Demarias (2002) study revealed that the primary reason a speaker seems to use the "…it's the least I could do" construction when expressing gratitude is simply to bypass a potential lengthier negotiation of how much gratitude would be enough. Akin to the foot-in-the-door persuasion technique – by contrasting a given request with a much larger one (i.e., in first asking for something large, being refused, and then following up with a request for something smaller, a person increases the likelihood of getting that second smaller request). Similarly, by a speaker suggesting that a favor granted was the "least" thing the speaker could have done, they can authorize an inference about greater favors that *could* have been done. This can act as its own "compliance lever" to get the person to accept the favor and move on. So rather than expressing esteem through a reduction in a perceived obligation, the "least" construction seems to use the foot-in-the-door technique to cut off lengthier negotiation.

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aforementioned hyperbolic future favor offer and the demonstration of trust and sacrifice the offer displays. Indeed, the variety of mechanisms and goals at play in these particular gratitude acknowledgment situations points to a more all-encompassing approach to gratitude acknowledgements, and indeed, to all figurative language use and processing – Constraint Satisfaction.

13.2 Constraint satisfaction

The notion of Constraint Satisfaction is widely used in a number of disciplines oriented toward computational problem solving, including a variety of subfields of psychology and linguistics. A review of this approach is far beyond the intent and scope of this chapter. But an increasing number of scholars have begun to investigate using the approach to understand figurative language use and processing (see, Katz's 1995 treatment of verbal irony; Katz, 2017; Pexman, 2008; Turcan & Filik, 2017; Colston, 2015), and it bears mentioning that Constraint Satisfaction might apply to figurative gratitude acknowledgements studied here as well.

Very briefly, Constraint Satisfaction applied to figurative language usage essentially argues that a number of requirements will always be present in a given speaker's usage of a form of figurative language in a context. The speaker's job is to find the best optimal solution which maximizes the degree to which these requirements are met. The requirements are not universal, nor are they always present or of equal magnitude. But a speaker will be motivated to satisfy the given set of requirements present, at their particular strength. The speaker will thus construct his/her language and delivery accordingly. Among some of these possible constraints are Gricean Principles, the mechanisms of Relevance Theory and Politeness Theory, topicality (Chafe 1976, 1979, 1980; Givon, 1983; Wilson & Sperber, 2012) social norms and expectations, schematic knowledge, discourse goals, pragmatic functions, and the like.

To illustrate these constraints in operation, consider again the variety of influences on a speaker in the position of using a figurative gratitude acknowledgment in response to a gratitude expression, (1) a response is expected from the recipient of the gratitude expression [hereafter, the speaker], (2) the speaker likely feels positively toward the addressee, (3) the speaker wishes to express these feelings, (4) such an expression does not fare well if displayed directly or prematurely, (5) the topic of favors is the general thread of the current conversation, (6) a demonstration of willingness to sacrifice can display positive feelings indirectly, (7) the risk inherent in making a hyperbolic future favor offer conveys an added component of positive feeling expression because it implies a trust in the addressee, (8) overly qualified offerings will diminish from the offer, (9) the use of many figurative forms delivers a wayward compliment via the implied expectation that

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the addressee is capable of comprehending the utterance,[15] (10) a given addressee has certain language comprehension abilities, (11) a variety of basic cognitive and linguistic principles are at play, and very likely many others.

Speakers run this or a similar gauntlet when speaking in any situation. Many situations, such as those involving gratitude acknowledgment, are recurring with enough frequency and similar in form, that fairly well established solutions have been worked out and become formulaic. The range of these solutions constitutes the field of candidate utterance forms from which the speaker can choose, but there always remains some degree of live influence to which the speaker must respond. Certainly speakers with differing abilities will adapt to these influences with differing adroitness, and indeed very clever speakers can occasionally invent completely new solutions which may or may not gain broad usage. But in all such instances, language usage presents just these kinds of constraints which must be negotiated and, ideally, satisfied optimally.

14. Inclusion and authenticity

We can now turn to the question of how inclusion of this type of figurative formulaic language, as well as the use of authentic utterances, help advance the research on, *why people don't say what the mean*. Any encompassing account of why people use figurative language must include all types of figurativity. For example, one can discuss a number of advantages figurativity in general provides for speakers (see Colston, 2015). But the list of these benefits and our understanding of them may be incomplete unless all types of figurative language are considered.

For instance, position flexibility is one example of these general advantages. By not directly stating what one means, and by offering alternative meanings viable in the particular context at hand, a speaker can increase his or her flexibility in terms of the position others think he or she holds. If someone offers an opinion you disagree with, for instance, and you respond indirectly by saying lightly, "Yeah, that might be true", with slightly consolatory intonation, it is not clear what position you hold. One interpretation is you agree and are giving in. Another is that you disagree but do not wish to openly contest the opposed view. Such indeterminateness holds several advantages for speakers. Among these are speakers' ability to avoid ill-will by not obviously opposing others. Another is that speakers can switch views at a later point in time. Much of the work on

15. Termed, "ingratiation" by some scholars (Colston, 2015).

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indirect requests documents this phenomenon (see Gibbs, 1994 and Colston, in press, for reviews).

This position flexibility is well known for figurative language as well. Consider the mixed negative and positive pragmatic functions of verbal irony (Colston, 2015; 2002a; Colston & O'Brien, 2000a, 2000b; Dews & Winner, 1995, 1999; Dews, Kaplan & Winner, 1995), where speakers can both bolster the degree of criticism as well as soften its impact via the use of sarcasm. Metaphors also can aid position flexibility via their euphemistic and dysphemistic abilities (Colston, 2015; Pfaff, Gibbs & Johnson, 1997), as well as in their semantic flexibility. Verbal irony, metaphor and other figures are also useful in expressing humor, which can indicate ambiguous speaker intentions and thus support position flexibility. Colloquial tautologies are perhaps one of the best figures at accomplishing position flexibility because of their anomalousness (Colston, 2015; Gibbs & McCarrell, 1990).

But, the pervasiveness of position flexibility as a general advantage of figurative language may be overestimated by considering only these standard categories. Indeed, one of the key findings of the current study is that speakers who use formulaic figurative language in the form of gratitude acknowledgements are in some ways very restrained in their position flexibility. In order to perform the pragmatic functions of figurative gratitude acknowledgements a speaker must commit to a position that is not easily retractable. If the speaker does not make such a commitment, the functions are not performed. Indeed, such a restriction is common to many forms of formulaic language (DuBois 1986).

A second general advantage of figurativity is that of discourse maintenance or catalysm. Speakers can use figurativity to keep a conversation rolling which otherwise might have stalled had more nonfigurative commentary been used. For instance, if someone asks you how your recent vacation went, a nonfigurative response such as, "It was very nice", provides less of an obvious follow-up for the other person. An figurative reply, however, as in, "It was interesting" or "It was a hangnail", might spur the other person to find out more. For instance, was "interesting" meant as a euphemism or more nonfiguratively? Relatedly, was "hangnail" intended as a general remark of negativity, or as a more specific analog to the pattern of negativity (e.g., things were generally good except for one small nagging annoyance).[16]

Again, this advantage is also well known for standard forms of figurative language. One will often find chaining, for instance of ironic (Colston, 2000c; 2015; Gibbs, 2000; Corts, 2006), and other figurative utterances in conversation (Honeck 1997), where one figurative utterance leads to another, which in turn spurs yet

16. Relevance Theory elegantly explains this process.

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another, etc. Whether due to a priming mechanism (Honeck, 1997), or to other causes like exchanged glib portrayal of increasingly ironic perspectives (Colston, 2000c), or ironic routines (Gibbs, 2000), this phenomenon is clearly an aspect of several kinds of figurative language.

But again the overall picture may be incomplete by looking only at standard figurative language. Indeed, one of the hallmarks of formulaic language is that it, "ease[s] the execution of long stretches of speech", and "facilitate[s] social relations" (Coulmas, 1998). In this instance exclusion of formulaic language may lead to an underestimation of the degree, or at least a failure to appreciate the complexity, with which figurative language is considered to catalyze continued conversation.

A third general advantage figurativity supplies is ingratiation. By uttering an figurative remark that is not intended nonfiguratively, a speaker is effectively delivering a subtle complement to his or her addressee. By stating remarks that require addressees to derive complex intended meanings, an implicit assumption that the addressee is *capable* of deriving those intentions must be held by the speaker. This arguably greater expectation presented by the figurative utterance, and the belief that the addressee has the ability to rise to the comprehension expectation, can make the addressee feel positively toward the speaker for acknowledging this capability.

This phenomenon is well documented in figures such as standard metaphor (Colston, 2015; Cohen, 1979; Gibbs, 1994), proverbs (Honeck, 1997), idioms etc., as well as in indirectnesses such as private keys (Clark & Schaefer, 1987). In the latter case, the leveraging of references held only in the common ground (Clark & Schafer, 1989) of interlocutors leads to greater knowledge intimacy.

Again, though, by not considering formulaic language as a possible figurative category, we may under- or misappreciate this general advantage. Given the current study's demonstration that expression of positive attitudes toward an addressee is one of the key pragmatic functions of nonliteral gratitude acknowledgements, and that at least some of this expression is achieved by demonstration of an overt trust placed in the addressee to comprehend the utterance as it was intended, we may be underestimating the power and complexity of ingratiation in our overall consideration of figurative language.

The last general advantage of figurativeness I will consider here is that of sophistication display.[17] Given all the complexities inherent in figurative language discussed thus far, the mere use of a figurative utterance can demonstrate the

17. Other general advantages of figurative language (e.g., expressibility, compactness, vividness, psychotherapeutic advantages, memorability, community identification, distancing, etc.

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sophistication of the speaker (Colston, 2015). Speakers would either have to have spent considerable time contemplating the intricacies of figurative language, have developed figurative skill through experience and/or observation, or just be generally intelligent, in order to use it successfully. A given figurative conversational contribution that adroitly accomplishes a variety of complex pragmatic functions is thus a poignant display of the speaker's sophistication.

Once again, however, the degree to which figurative language is considered a sophistication display may be inaccurate without consideration of all potentially figurative types. Formulaic figurative language in particular can be useful for demonstrating one's communicative finesse. Formulaic language is frequently used between people who are unfamiliar with one another and thus carries much of the weight of a first impression. As the findings of the current study show, it is also very subtle – proper use of gratitude acknowledgements is thus an opportunistic early demonstration of communicative skill. Formulaic language can also serve as a strong indicator of one's experience with a particular language. Indeed, appropriate use of formulaic language is a clear indicator of many aspects of one's social standing:

> From a sociolinguistic point of view, formulaic speech incorporates sociocultural knowledge. For handling many recurrent communicative tasks characteristic of a society or social group the appropriate expressions are socially recognized formulas (Coulmas, 1981). In that they embody accepted ways of responding verbally to a variety of situations, they facilitate social relations and thus have an adaptive value. Since they are indicative of conventions and etiquette, they are a means of social control. Many situations leave very little choice for the 'right word.' Using the expected formulas is a strong indication of belonging, social identity or acculturation. Their knowledge creates and reinforces social cohesion. (Coulmas, 1998)

One final point concerning methodologies is warranted. The present evaluation of the pragmatic functions accomplished by gratitude acknowledgements was made using a methodology which provides an appealing compromise between purely experimental and purely field, observational or corpus-based studies. By collecting reasonably real utterances offered by normal, everyday speakers, instead of using experimenter-crafted comments, a much-needed improvement in ecological validity is gained. Indeed, the authentic gratitude acknowledgements collected in this study are much richer than what would likely have been created by an experimenter. They are often grammatically questionable (e.g., "I'm sure good",

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[see Gibbs, 1994]), may also require rethinking as we bring new types of nonliteral language into consideration.

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"I'm real sorry your bike got stole", etc.). They do not always use fully complete sentences (e.g., "Refresh on old stuff", "You could have", etc.). They refer to subtle details of the contexts (e.g., "The jacket looks good on you", "How was the party", etc.). They make use of colloquialisms (e.g., "No sweat", "it's all good", etc.), etc.

On the other hand, by manipulating people into producing these utterances in reasonably controlled situations rather than simply capturing usages in fully natural settings, some of the looseness in fieldwork in terms of causal agents/links, generalizeability, replicability, etc., is reduced. Future work might continue to make use of such a compromise methodology as an alternative to more extreme procedures.

It thus appears that, although there is in fact reason to be concerned about the two problems in the recent psycholinguistic research on *why people don't say what they mean*, there is also much to be gained by addressing these problems. Study of categories of figurative language besides standard figurative ones may redirect our theorizing about how figurative language works. Moreover, insights into the richness, subtlety and perhaps most importantly, complex *combinations* of figurative, indirect, formulaic and other nonfigurative and direct language types, will likely ensue by attempting to use more authentic items.

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How nice does it sound?

An argumentative approach to the affective aspects of irony production

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The chapter presents irony as a form of the *reductio ad absurdum* argument having a specific emotional charge, which cannot be found either in literal arguments or in other arguments containing figurative language. The claim of the chapter is that irony production depends on the ironist's ability to convey the emotional charge together with the point she invites the addressee(s) to infer. An empirical study is presented aiming (1) to understand whether and when participants produce (non-sarcastic/sarcastic) ironic vs. literal arguments having a positive vs. negative emotional charge and (2) to check whether and when participants revise their own (non-sarcastic/sarcastic) ironic vs. literal arguments when they are at the addressee's side, in both critical and praise irony conditions.

Keywords: irony, sarcasm, emotions, argumentation

1. Irony as an indirect argument

The study of irony is plagued by problems of defining similar subcategories of a broad class of *humorous phenomena*, which are often described by imprecise folk-terms such as humour, sarcasm, funny, laughable, ridiculous, etc. (Attardo, 2002, p. 166). Irony is generally seen as distinct from humour and is precisely defined, in Classical Rhetoric (Quintilian, 96 a.C.) and Standard Pragmatic View (Grice, 1989), as conveying the opposite meaning than what is being said. In the Gricean perspective, the ironic comment "Chris is a fine friend" – said by Tom to an audience knowing that Chris, Tom's friend, betrayed him – is an implicature, i.e. a pragmatic inference generated by flouting the maxim of Quality ("Do not say what you believe to be false"). Previous studies on irony focus on the distinction between irony and sarcasm (e.g. Gibbs, 1986; Bowes & Katz, 2011; Leggitt & Gibbs, 2000; Kreuz & Johnson, in this volume). This work considers sarcasm as a sharp version of irony where the ironic comment has a designated victim, explicitly

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targeted (Lee & Katz, 1998), as in the example above. Moreover, it assumes that, precisely because there is a designated victim, sarcasm is "intimately associated with particular negative affective states" (McDonald, 2000, p. 88), and therefore felt as more offensive and aggressive than irony (Attardo, 2007). Sarcasm might be delivered with a cutting tone, while irony presents a great variety of subtleties in mocking in a sharp and non-offensive manner, though there is some debate regarding the role of a sarcastic tone of voice, or what this sounds like (see for criticism Kreuz & Johnson, in this volume). Interestingly, it may also vary by country (e.g. Cheang & Pell, 2009).

Understanding an ironic utterance, such as "See what a lovely weather!" pronounced on a rainy day, is a complex process. Other than recognizing a lilting tone of voice or a wry facial expression, irony requires a listener to not only understand the speaker literally, and that the literal meaning, i.e. the conventional or default meaning, was not meant as such by the speaker, but also the fact that the speaker understood that listener knew that the speaker did not mean to be taken literally. Understanding the ironic or non-default meaning is a pragmatic process (Grice, 1989; Sperber & Wilson, 1981, 1986/1995), as it is inferred from a mutually shared context, based on a number of factors (see Kreuz & Johnson, in this volume). Some well-known everyday misunderstandings and the need to ask the speaker whether she is joking or not, in order to better understand what she really meant, testify the fact that literal meaning could still be easily considered as a plausible interpretation of the ironic utterance pronounced, even if contextually irrelevant or inappropriate. In the Salience-based hypothesis framework, Giora argued that, in spite of contextual information, the "so-called irrelevant meanings are activated because they are salient" (Giora & Gur, 2003, p. 299), i.e. the most frequent, familiar, conventional and prototypical/stereotypical meanings stored in our mental lexicon (Giora, 1997, 2003). It would be precisely the initial activation of incompatible literal interpretations that makes the comprehension of ironic utterances so difficult and a process prone to mistakes (Anolli et al., 2001; Lagerwerf, 2007).

If irony comprehension involves a two-stages processing of both literal and ironic meanings, this should be reflected in processing times that are longer than those required to understand literal utterances. This conclusion is highly controversial: some findings support this hypothesis (Giora, Fein & Schwartz, 1998; Dews & Winner, 1999), but other empirical evidence shows that ironic utterances take no longer to be processed than literal utterances (Gibbs, 1986, 1994). These latter results instead underpin the hypothesis of a one-stage irony comprehension process, as endorsed by the Direct Access Model (Gibbs, 1986, 1994, 2002) or the Allusional Pretense Theory (Kreuz & Glucksberg, 1989; Kumon-Nakamura, Glucksberg & Brown, 1995). According to Giora, claiming that irony comprehension is a one-stage

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process would make ironic language use "as easy to understand as literal language" (Giora, 1995, p. 240). However the data can also support theories, such as the Joint Pretense Theory (Clark & Gerrig, 1984; Clark, 1996) and the Tinge Hypothesis (Dews & Winner, 1995, 1999), claiming that understanding of irony is a one-stage, but two-layered simultaneous process of both literal and ironic meanings (see Colston & Gibbs 2007; Giora 2003 for a review of contemporary theories of irony). As Curcò noted, "it is possible to conceive of a very complex single stage, so that even if irony comprehension should take place in one single stage […], it is not a necessary conclusion that it is as easy to interpret as non-figurative language" (Curcò, 2000, p. 267). The number of stages involved in the processing of irony is not necessarily connected to its difficulty of comprehension. Following Curcò's suggestion, this chapter considers irony comprehension as a difficult task precisely because different sources of information simultaneously contribute to the processing of irony, which depends not only on the salience of literal meanings and the kind of context of use, but also more specifically on the emotional load non propositionally communicated by the speaker.

Indeed, despite the differences about the complexity involved in the processing of irony, all the theories recognize the importance of a wider context to understand the ironic intention, conceived as a "complex configuration of shared knowledge, beliefs, values, and communicative strategies" (Hutcheon, 1994, p. 91) adopted by interlocutors. In this perspective, irony can play a fundamental argumentative function as it is a strategic way for the ironist to express her thought, by both exploiting this rich contextual set of assumptions and modulating her charge of criticism in judging the interlocutor's thought. From an argumentative perspective, it has indeed been claimed that irony might be seen as a form of *indirect argument* (Karstetter, 1964; Holdcroft, 1983; Averbeck, 2015), which is ubiquitous in (interpersonal) potentially conflict situations (Gibbs, 2000). This has been defined as the "corrective function" of indirect arguments (Ettema & Glasser, 2004): in conflict situations, an indirect argument might be used to avoid hurting the interlocutor's feelings (Colston, 1997), to show deference to authority (Brown & Levinson, 1978), or to deceive one's partner (Buller & Burgoon, 2006). As pointed out (Muecke, 1969), the ironist reveals and indirectly criticizes an assumption that was ungrounded, had unwarranted expectations, violated norms, beliefs or facts that turned out to be false. The predominant rhetorical account focused indeed on indirect criticism as a function of irony (Cutler, 1974; Muecke, 1970; Booth, 1974; Grice, 1989). Indirect criticism is a powerful argumentative tool, "affording one with the liberty to criticize publicly, without being committed to the literal value of the words" (Dyzman, 2012, p. 85). This might be also the way the ironist attempts to persuade the receiver not to perform a particular behavior (Averbeck &

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Hample, 2008). As it has been pointed out by Burgers, Konijn and Steen (2016, p. 8, emphasis mine):

> Irony could work as a reasoning device by illustrating defective expectancies and norms, and putting these into perspective. Through irony, readers can become aware of the fact that a traditional problem definition, causation, expectancy or norm is no longer valid, and thus acts to change the problem definition, expectancy or norm to fit the general state of affairs. In this perspective, irony can no longer be seen just as a linguistic device but also as *a reasoning device in argumentation*, having important outcomes on the addressee.

In this chapter argumentation is seen as the act of providing "a reason or set of reasons given with the aim of persuading others that an action or idea is right or wrong" (see *New Oxford American Dictionary*, online edition, for different definitions). As pointed out in argumentation theory (Perelman & Olbrechts-Tyteca, 1969, p. 207; Tindale & Gough, 1987; Jansen, 2005), irony can be defined as a form of the *reductio ad absurdum* argument: the ironist does not directly provide a reason for a thesis, but rather indirectly shows that the thesis the interlocutor might have endorsed or actually endorses, would lead to absurdity and/or unreasonableness. The irony producer introduces the interlocutor's thesis as a comment, which acts as a further (literal) premise added to the set of premises provided by the context. This new premise, together with the given contextual premises, makes it possible for the interlocutor to derive a contradiction or at least to realize the absurdity of her thesis when taken with its literal meaning. At the same time, it makes it possible for her to infer that the negation of the thesis should be endorsed, thus grasping the non-literal meaning. More generally, the ironist does not actually present a proper thesis to defend, but rather a point against a false, irrelevant, inconsistent, or unreasonable thesis the interlocutor would defend. The ironist does not reach this objective by ridiculing the interlocutor as for instance might happen in satire or by directly attacking the interlocutor instead of her thesis, as in *ad hominem* fallacious arguments. Sometimes the interlocutor's thesis is even not explicitly mentioned by the interlocutor herself, but just implicitly showed in her behavior. Even though the ironic argument might be perceived as nasty especially when the target of the comment is a person, as in the case of sarcasm, it is particularly persuasive because it is not a fallacy: it is instead an indirect way to show that the interlocutor's reasoning is fallacious. While admitting that "it might be better to avoid its use at the dinner table" (Davidson Scott 1990, p. 154), argumentation scholars pointed out that the *reductio ad absurdum* is a powerful argumentative strategy, because it pushes the interlocutor's opinion past the acceptability point and thus it might leave the interlocutor unable to answer.

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In Kaufer's view (1977, 1983), the receiver might then be a "confederate", who understands the ironic argument, or a "victim", who grasps only the literal meaning. Whilst the irony producer intentionally presents an indirect argument which makes use of both the non-literal and the literal meaning, the irony understander cannot be both a "confederate" and a "victim" at the same time, because she cannot hold both the literal and the ironic meaning without contradiction. On the one hand, there is always the possibility that someone reads the ironic argument literally, supplying premises from the background contextual information in support of the literal reading. In such cases, the comment would serve as a conclusion, rather than as a further premise aimed to indirectly show that another (pragmatically inferred) conclusion should be endorsed. On the other hand, irony would be attractive just for "confederates" who very likely would not need the *reductio ad absurdum* argument. An ironic argument would indeed be worth employing to convince people who were previously opposed or hesitant with respect to the ironist's point. Indeed, as pointed out (Tindale & Gough, 1987, p. 4), an ironist as an arguer should want "to persuade his audience of some particular point or points, and to this end it is in his own interest to make his argument as clear as possible". However, when it comes to irony, the ironic argument is never "clearer" than the literal, and very often a simple direct argument would probably work better.

It has been pointed out that the ironic argument makes use of what has been called "suggestive language", which is particularly dangerous for "inexperienced readers/listeners":

> Language that is rich in suggestion is highly economical, for it says a good deal briefly. But at the same time it is hard to control and likely to betray all but the most experienced writers. And in the hands of an unscrupulous writer it is especially dangerous, for it is by suggestion that he can get across implicit assertions without quite letting them out into the open where they can be inspected and criticized. But there is a way to deal with him. Generally speaking, whatever is suggested can also be stated. (Beardsley, 1957, p. 253)

From this point of view, the solution would be to "reform" the arguments containing such "suggestive language", changing ironic sentences into literal ones. However, even though the ironist could spell out and make her indirect argument explicit to make sure that the receivers get it, it would lose its effects (Tindale & Gough, 1987). The ironist would therefore find himself at the crossroads of a dilemma: if the irony of an argument is literally explained, then its effect is diminished or completely lost; if it is too subtle to grasp then the intended addresses will not be able to grasp it. Does the ironist intend to produce such a dichotomy in the audience? Barbe (1995) pointed out that dichotomy is "the" constitutive feature of

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irony. Indeed, the confederate/victim dichotomy is one of a series of potential levels of dichotomy in irony, which includes: (i) literal and intended meaning incongruity (Colston, 2002; Colston & O'Brien, 2000; Gerrig & Goldvarg, 2000; Ivanko & Pexman, 2003); (ii) linguistic meaning and behavior incongruity (Gibbs, 1986; Jorgensen, Miller & Sperber, 1984; Kreuz & Glucksberg, 1989; Kumon-Nakamura, Glucksberg & Brown, 1995; Sperber & Wilson, 1981, 1986/1995); (iii) linguistic meaning and affective evaluative incongruity (Sperber & Wilson, 1981; Kreuz & Glucksberg, 1989). As it has been claimed, verbal irony production might be seen precisely as "the *creation* of such contradictory categories by an ironic speaker" (Colston & Athanasiadou, 2017, p. 4).

Especially if the ironist wants to persuade someone of something, why should she take this risk? The hypothesis of this chapter is that the ironist does not simply want to persuade the audience, but she wants to persuade the audience in a particularly forceful way. Namely, the ironic argument has a specific emotional charge which cannot be found either in literal arguments or in other arguments containing "suggestive language". Irony is indeed a particular form of the *reductio ad absurdum* argument, precisely because it is affectively charged, thus conveying also an "emotional evaluation". The success of irony will depend very much on the ironist's ability to convey this emotional charge together with the point she wants to claim, i.e. the absurdity of the literal thesis. Indeed, irony does not just "engage the intellect rather than the emotions" (Walker, 1990, p. 24). However, the ironist's choice to use an indirect, emotionally driven argument, is limited precisely because the possibility of literal readings and of misunderstanding is always there. Therefore, the literal meaning vs. affective meaning dichotomy in ironic arguments is what this chapter aims to investigate. To this purpose, the next section investigates the affective aspects of irony, showing that the emotional charge of irony is not in contrast with its argumentative function: because of their strong implicit evaluative dimension, emotions might instead play a fundamental role in an indirect argumentative strategy such as irony. Section 3 critically discusses previous literature, focusing on the specific role of the emotional load in modulating (non-sarcastic and sarcastic) irony in both ironic criticism vs. praise. In Section 4, an empirical study is presented, aiming to show whether producers will take the addressees' perspective, especially in sarcastic irony production, when it comes to sparing the latter's feelings. Participants provided completions to stories and were required to choose the nicest completion across several contexts, to produce (either non sarcastic or sarcastic) ironic vs. literal arguments. Later, they rated the comments they chose to produce the ironic vs. literal arguments, interspersed among comments "from other participants" and asked whether the comments were nice or mean. In Section 5, the results of the empirical study are discussed, focusing on the contrasting perception of the

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emotive charge in ironic criticism vs. praise, when viewed from both the position of the ironist and the listener.

2. The affective and evaluative aspects of irony

A full understanding of irony entails some appreciation of why the speaker chooses this argumentative strategy to express her thought. Thus, not only has the addressee to judge the literal interpretation of the comment as leading to an *absurdum*, but also she has to grasp the intentional contrast due to a *negative or dissociative attitude* as the Echoic Mention Theory pointed out (Sperber & Wilson, 1986/1995; Wilson & Sperber, 1992; Wilson, 2009). This negative attitude or mock disappointment has been considered specific to irony and sarcasm (Jorgensen, 1996; Pexman, 2005), as opposed to other humorous phenomena. Winner and Leekam (1991) suggested that understanding the attitude behind a speaker's use of verbal irony requires the ability to recognize even a third-order mental state, in addition to the second-order one about the speaker's intention. They claim that the understanding of a third-order mental state involves the judgment that "the speaker wants (first-order) the listener to believe (second-order) that the speaker has a particular attitude (third-order)" toward a thought (Winner & Leekam, 1991, p. 268).

Recognizing the speaker's ironic attitude is more demanding than recognising the speaker's intention, because it requires a very complex social and communicative ability (Ervas & Zalla, 2012; Cocco & Ervas, 2012): rather than just searching for reasons, the addressee needs to (often less consciously) grasp what is changing in the speaker's behaviour, e.g. intonation, shifting of attention, mode, etc., which might signal the specific ironic attitude. Previous literature shows that irony seems a more polite way to express the speaker's own thought precisely because it is an indirect way to comment on the failure of an expectation (Sperber & Wilson, 1981, 1986). In case of ironic insults, it seems to be not only more polite, but also more positive (Pexman & Olineck, 2002) than its literal counterparts. It is not so easy to make sense of verbal irony use in spite of all the nuances of perceived behavior: in most cases irony seems not only negative, but also insincere and scornful. We could wonder why the ironist chooses this communicative strategy, so prone to misunderstandings, and why she produces ironic arguments, so difficult to understand, to convey her thought. It has been showed that people produce verbal irony because it plays an important role as a reminder of a social, moral, or aesthetic norm tacitly shared by a culturally-defined social group (Katz & Lee, 1993; Kreuz & Glucksberg, 1989; Kumon-Nakamura, Glucksberg & Brown, 1995; Gibbs & Colston, 2001), and also because it is useful to convey emotions and modulate

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their intensity (Gibbs, Leggitt & Turner, 2002). Thus, the ironist usually ironizes to express emotional or otherwise affectively loaded attitudes, which are motivated by a contrast between a claim, thought, or expectation that the ironist is alluding to and the context. However, there is a number of ways to convey emotional contents, as pointed out by Dyzman (2012, p. 84):

> Most effective and efficient are the nonverbal means: facial mimicry, smile-to-frown range of (micro)expressions, emotional prosody, rich repertoire of gestures, and body postures. These 'tell' more than words. Emotion-wise that is. They communicate feelings and attitudes. Emotional contours always tinge verbal interactions, yet remain as pervasive as unexplored. Accumulative experimental evidence shows that emotional contents attached to a message, beyond verbal code (smiling-frowning range of facial work, affective prosody) plays a significant key role in message comprehension, facilitating or delaying the intended meaning grasp. Though deeply interrelated with communication, nonverbal emotional contents, and its impact on verbal contents processing, remains largely unexplored.

Among the different indirect verbal strategies we use to convey this emotional load non-propositionally attached to the propositional contents, irony might be considered the one which most serves to convey implicit affective attitudes.

As for instance Barnden (2017) reminds us, the ironist's attitudes are typically negative, i.e. bitter mockery, ridicule, or indignation, although they might be non-negative (e.g. surprise, Colston & Keller, 1998), or less-negative, such as mild criticism, or disapproval, or just humorous teasing (Kumon-Nakamura, Glucksberg & Brown, 1995; Gibbs, 2000, but see Wilson, 2013 for criticism). Thus, irony would be a strategic choice to indirectly express criticism while communicating a wide range of emotional attitudes, which would be difficult to convey via literal comments. This chapter does not intend to discard any theory of irony mentioned above, but it rather pays attention to the emotional aspects of irony that are often neglected or put in the background in explaining the production of irony and are instead the main feature of irony as an indirect argument. The chapter aims indeed to argue that the affective charge is specific of irony as a form of *reductio ad absurdum* and plays a fundamental role in ironist's choice to produce (or not to produce) an ironic argument. This might be seen as extremely controversial, because, in Western philosophical tradition, the notion of argumentation has been defined as the critical use of reason in judgment, in contrast to emotions. Indeed, in the dominant rationalist model, emotions have a negative role – if they play a role at all – because rational justification seems to be the unique relevant source of knowledge at a normative level (Walton, 1992; Macagno & Walton, 2014). First, emotions have by definition a partial value: they safeguard prospective, subjective and temporary interests, and therefore cannot be considered a source for rational

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universal standards in argumentation. Second, the emotional processes are widely automatic, unconscious and obligatory, whilst the critical use of reason is supposed to be governed by the controlled and conscious use of justification (Ervas, Gola & Rossi, 2015).

However, emotions are an important source of knowledge and might also play a fundamental role in reasoning because of their strong evaluative dimension: they assign a positive or negative marking to some features (of objects or events) that might be important for organisms from a biological-evolutionary perspective (Damasio, 1994). Emotions are indeed cognitive processes used to represent the positive and negative valence of things and actions in the world. As Dyzman (2012, pp. 89–90) acknowledges, "studies of the conceptual organization of emotion support the view that people's knowledge about emotions is hierarchically organized to respect a super-ordinate division between positivity and negativity". Emotions have a fundamental impact on the speaker's attitude, seen as an "affect for or against a psychological object" (Thurstone, 1931, p. 261), i.e. favorable vs. unfavorable evaluative characterizations of stimuli. Previous studies show that there is indeed a basic difference between the positive and negative values attitudes convey (Allport, 1935; Lewin, 1935; Ito et al., 1998; Ito & Cacioppo, 2000, 2001, 2005), "by evaluating a particular entity with some degree of favor or disfavor" (Eagly & Chaiken, 1993, p. 1). Any attitude is therefore implicitly evaluative and generates two basic dispositions, attraction and aversion (Shizgal, 1999; Davidson et al., 1990): positive valence refers to the attractiveness and negative valence to the aversiveness of stimuli (Lewin, 1935; Damasio, 1994). Positive vs. negative valence, as a fundamental property of emotions (Barrett, Lindquist & Gendron, 2007), is a special "semantic primitive" (Osgood, Suci & Tannenbaum, 1957), which determines the intended meaning.

The positive vs. negative valence processing patterns have been reported for both explicit and implicit attitudinal meaning in irony understanding (Ivanko & Pexman, 2003; Dyzman, 2010). Therefore, valence processing mechanisms deserve a more thorough investigation in irony research (Dyzman, 2012; Yus, 2016). The attribution of the positive or the negative valence depends on the perspective of the speaker who feels the emotion and not on the object of the world. From an evolutionary point of view, the automatic, unconscious, and obliged character of emotional processes is extremely important: emotional processes allow for quick action without extensive thinking. Emotions provide behavioral evidence and are useful predictors of action despite the fact that they are not explicitly intentional. For instance, an escape reaction in case of fear, or an attack reaction in case of anger, are relevant examples for evolutionary rationality (Damasio, 1994; Frijda, 1986; Evans, 2002; Le Doux, 1996; Plutchik, 1994). Positively valenced stimuli are processed faster, as they do not represent

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a threat and they do not urge for an answer in behavioural terms (Shizgal, 1999; Davidson, 1994). Negatively valenced stimuli require longer times for elaboration and higher processing intensity when compared to positively valenced stimuli, precisely because they represent potential threats demanding an immediate response (Baumeister et al., 2001; Rozin & Royzman, 2001; Taylor, 1991; Pratto & John, 1991; Ojha, Ervas & Gola, 2017). Previous literature on attitude research shows that the effects of positive and negative valence are processed by separate neural systems (Davidson, 1994; Cacioppo & Gardner, 1999; Barrett & Bar, 2009) with different speed (Smith et al., 2003; Kawasaki et al., 2001; Ito et al., 1998) and intensity (Ito & Cacioppo, 2000, 2005; Kawasaki et al., 2001). From this perspective, emotions can be considered cognitive processes of framing and reframing, or, in other words, processes which can redirect and intensify attitudes (Macagno & Walton, 2014; Ervas, Gola & Rossi, 2015).

Maiese (2014, p. 524) proposes the term "affective framing" precisely to express the idea that emotions are "a spontaneous, non-inferential, and pre-reflective way of discriminating, filtering, and selecting information that allows us to reduce the overwhelming clutter of information to something first-personally manageable and confer upon it specific cognitive significance". Framing and reframing strategies do not always have a positive meaning in reasoning and argumentation. As (re)framing is a rhetorical strategy, it could indeed be interpreted as a sort of manipulation, especially within the Western philosophical tradition in reasoning and argumentation (Ervas, Gola & Rossi, 2015). Argumentation, therefore, needs to turn its attention to the use of irony from a new perspective, including the emotional/affective aspects, to examine their constructive (or destructive) potential (Averbeck, 2013). In contrast to this tradition that has neglected the affective aspect of communication, Mascaro and Sperber (2009) have recently argued that the capacity for epistemic vigilance enables people to filter misinformation, based not only on epistemic but also on affective knowledge. They hypothesize that we need a developed capacity to be epistemically vigilant in order to filter out misinformation (Mascaro & Sperber, 2009). The capacity for epistemic vigilance towards communicated information would be fundamental to distinguish, for instance, irony from lie (Wilson, 2009). In their view, a fully-fledged capacity for epistemic vigilance should have three aspects: (1) an affective aspect involved in attending to malevolence; (2) an epistemic aspect involved in attending to falsity; (3) a mind-reading aspect involved in attending to speaker's intention to deceive.

Some of the cognitive mechanisms presupposed by the capacity for epistemic vigilance are targeted at the source of information, others at its content. This complex capacity is responsible for filtering incoming communicated information, pondering the plausibility of claims, evaluating arguments, putting our trust in interlocutors, etc. (Sperber et al., 2010). In this perspective, emotions,

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far from being totally automatic, unconscious, and obliged, might contribute to the appreciation of both the source of information and its content. Different from deception, irony might involve a positive role of emotions to induce a creative style of argumentation in the ironist. On the one hand, both irony comprehension and lie detection involve the ability to assess communicated information as true or false (an epistemic component) and the ability to recognize an utterance as *intentionally* false (a mind-reading component). On the other hand, irony is different from deception because the intentionally false utterance is used to communicate something true: the absurdity of the literal claim, in the argumentative view proposed in this chapter. Moreover, irony comprehension requires the ability to understand that the intentionally false utterance is pronounced by the speaker to *display* her epistemic status (Wilson, 2009, 2013). Irony can be considered as more demanding precisely because it involves an implicit evaluation of the speaker's claim, charged with affective attitude (Yus, 2015), on a situation (in case of irony) or on the explicitly targeted addressee (in case of sarcasm).

3. Blurring the boundaries of irony's affective aspects

A full-fledged capacity to be epistemically vigilant towards irony detection requires a proper integration of the speaker's affective evaluation (source of the utterance) to the epistemic and metarepresentational aspects of what is communicated (content of the utterance) (Origgi, 2008; Sperber et al., 2010; Yus, 2015). Moreover, data suggests that different forms of literal vs. ironic argument make the affective evaluation of the source and the content of the utterance somewhat different, giving rise to various, complex, emotional reactions (Leggitt & Gibbs, 2000). Ironic non-propositional affective cues are indeed contextually manifested and "may turn out [to be] as relevant a context for irony, as the linguistic context" (Dyzman, 2012, p. 88). When we produce irony, we indeed embed the linguistic, propositional meaning within the affective, non-propositional one. In irony use, the intended meaning is therefore the combination of both propositional and non-propositional meanings (Moeschler, 2009). As pointed out (Filik, Hunter & Leuthold, 2015, p. 119), "most theorists would agree that emotions play a role in the use of irony, yet the emotional impact of verbal irony compared to literal language is currently unclear". One step forward has been to consider the possible mechanisms via which the affective attitude may have an effect on irony modulations. Positive/negative-valenced attitude is indeed an implicit form of evaluation (Barrett, 2006), that characterizes the target of irony as bad or good, nice or mean. Previous literature shows that the affective attitude is accessed before the processing of other semantic features (Zajonc, 1980, 1984; Murphy & Zajonc,

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1993; Winkielman et al., 2003), and has an impact on the further processing of the target and therefore on the overall interpretation of irony (Bar & Neta, 2008; Barrett & Bar, 2009). As has been noted by Dyzman (2012, p. 97), the affective load of verbal stimuli "is processed pre-consciously, unlike the semantic contents, which requires conscious access to stimulus information" (Zajonc, 1980; Murphy & Zajonc, 1993; Bargh et al., 1996; Greenwald et al., 1989; Greenwald et al., 1996). An anticipatory effect in the recognition of the affective load of the incoming stimuli influences the speed and intensity of processing (Barrett & Bar, 2009). In particular, previous neuroimaging studies on irony processing show that the affective value processing areas are intertwined with "theory of mind" processing areas (Wakusawa et al., 2007; Uchiyama et al., 2006; Shamay-Tsoory, Tomer & Aharon-Peretz, 2005). In particular, these studies suggest that the role of the affective component is as crucial as other (epistemic and metarepresentational) components of the "theory of mind".

Being an indirect argument, irony is not overt in its criticism (Karstetter, 1964) and the addressee should infer the ironist's intention to criticize (Giora, 1997; Giora, Fein & Schwartz, 1998), therefore irony could be perceived as less negative when compared to literally negative comments. Previous literature (Dews & Winner, 1995; Filik et al., 2016; Jorgensen, 1996; Matthews, Hancock & Dunham, 2006) indeed claims that ironic criticism is perceived as less critical than a corresponding literal comment, "suggesting that an attack becomes less negative when delivered ironically" (Filik et al., 2017). In the perspective of the "Tinge Hypothesis", irony mutes the negative charge of the intended meaning because of the positive tinge invited by the misleading evaluative tone. Irony should therefore be better accepted by the recipient when compared to explicit ways of criticizing. Also, from the ironist's point of view, irony might be a more desirable way to criticize when compared to a literal comment: being an indirect argument, the inferred conclusion might be seen as a conversational implicature (Grice, 1989) that might be (strategically) cancelled whenever the ironist wants or needs. In this way, the ironist can manage the negative affective charge and save the "face" if needed. However, from an argumentative perspective, the ironist might favor the explicitness of the literal comment. In this case, the literal comment would not be just "dull and almost uninformative" (Giora, 1995, p. 259), because it makes the speaker feel obliged to justify her position and to provide fully supportive reasons for the criticism, in order not to hurt the interlocutor. On the contrary, the ironic argument reduces *ad absurdum* the position of the interlocutor, without providing any support for the ironist's position. For the majority of times, the ironist does not even have a position to support or a "constructive" alternative to propose.

Other studies (Blasko & Kazmerski, 2006; Bowes & Katz, 2011; Colston, 1997; Kreuz, Long & Church, 1991; Leggitt & Gibbs, 2000; Toplak & Katz, 2000)

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suggest that irony can instead enhance the negative emotions felt by the recipient of the criticism. The ironic indirect argument would be perceived in a more negative way, precisely because it seems insincere and sneering (Kumon-Nakamura, Glucksberg & Brown, 1995; Okamoto, 2007). In this perspective, criticism should therefore be perceived as more negative when viewed from the recipient's, than from the ironist's perspective (Bowes & Katz, 2011). As Filik and colleagues argue (2017, p. 194), "being on the receiving end of ironic compared to literal criticism is likely to provoke an enhanced negative emotional response (e.g., be more hurtful)". In this perspective, it is fundamental to distinguish different aspects of irony that might influence its affective charge. As reported by Leggitt and Gibbs (2000), the emotional load of irony depends not only on the intended meaning in specific contexts, but also on the type of irony, the relationship between the speaker and the recipient, and to some extent on the individual differences of the ironist. Indeed, claims about whether irony modulates the meaning of the utterance or bears a specific emotional charge clearly depends on the type of irony examined: as per definition given in Section 1, different from irony, sarcasm is oriented towards a person, who becomes the designated victim. Instead, irony is not person-centered and is generally perceived as more benevolent when compared to sarcasm, overtly addressed toward the addressee (Averbeck, 2013). Therefore, sarcasm should be less desirable for the receiver (Giora et al., 2005). Analysis over affective content suggests that sarcastic ironic comments are far more explicit than non-sarcastic ironic ones, which are perceived as a more creative way to convey implicit emotions (Sulis et al., 2016).

It would also be worth considering the ironic criticism vs. praise distinction to further investigate the emotional aspects of ironic argument (Kreuz & Link, 2002; Bruntsch & Ruch, 2017). For instance, the tinge hypothesis (Dews & Winner, 1995) suggests that "ironic criticism is viewed as less negative than literal criticism and ironic praise less positive than literal praise, due to ironic comments being tinged by their literal (opposite) meaning, leading to a 'muted' emotional response to ironic materials" (Filik, Hunter & Leuthold, 2015). Moreover, the production of ironic praise would be strictly associated with familiar contexts or talk among friends (Gibbs, 2000; Bowes & Katz, 2011). The mutually shared context among interlocutors (including mutual knowledge, beliefs, past experience, etc.) is known to be important not only for irony comprehension, but for comprehension in general (Clark, 1996). Some people are less able to detect irony than others, either generally or on specific occasions (Ito & Cacioppo, 2005, Blasko & Kazmerski, 2006): the ability to understand irony might be an indicator of the general capacity to comprehend others. What about irony production? It could be argued that in irony production the mutually shared context is fundamental for the ironist to choose or suppress the indirect argument. An individual speaker's social abilities

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and capacities for emotion regulation also influence the choice to produce ironic arguments: in particular, as reported by Akimoto and Miyazawa (2017), the abilities of expressive suppression, self-control, and playful humor are strong predictors of irony use. The following empirical study investigates whether people are influenced by the emotional load of critical vs. praise irony in both production and understanding of (non-sarcastic/sarcastic) ironic vs. literal arguments.

4. The empirical study

4.1 Specific background to the study

The emotional impact of ironic criticism might be quite different, depending on whether one takes the perspective of the addressee of the ironic argument, or of the ironist, i.e. the producer of the ironic argument. Previous studies show that, although ironic and literal criticism were both judged as impolite, they were judged more so when viewed from the addressee's than from the ironist's perspective (Toplak & Katz, 2000; Bowes & Katz, 2011; Filik et al., 2016). However, these studies are designed to investigate irony comprehension, as they ask participants how they (emotionally) understand an ironic comment and how they read the speaker's intention. In particular, Bowes and Katz (2011) found that sarcasm is perceived as more relationally aggressive and that the ironic comment is perceived as less aggressive when taking the perspective of the ironist than the perspective of the addressee. In the experiment, they presented "real-life" argumentative dialogues between two friends in various conflict situations, balanced per gender of the friends (female-female; male-male; female-male). In previous studies, gender is indeed found to be a strong bias to irony comprehension (see Cocco & Ervas, 2012, for a review of the literature). The questions posed to participants focused on the perceptions of the aggressor and the victim, as well as their relationship, the resolution of the argument, and verbal and relationally aggressive aspects of the conversation. Interestingly, the social aspects of irony were investigated including a question on the likelihood that the argument would have been resolved. The ironist's perspective was assessed by participants indicating the degree to which the victim thought the ironist's comments were polite or humorous. Instead, in the present pilot study the participants are asked to produce (non-sarcastic/sarcastic) ironic vs. literal arguments, thinking how they could be emotionally perceived by the addressee.

From an argumentative point of view, most previous studies consider the addressee's side and, more specifically, the emotional impact of irony on the receivers of the ironic comment (Averbeck, 2013; Filik et al., 2017). On the contrary,

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this empirical study is focused on the ironist's side and the affective process of irony production. This study assumes that the ironist can decide which arguments to produce to criticize and persuade her addressee(s) and, in particular, whether an indirect argument with "suggestive language" and a strong emotional impact, as in case of irony, would do a better job than a literal, direct argument. Referring to the editorial standards people use in judging whether or not to produce a particular argument (Hample & Dallinger, 1987a, 1987b, 1992; Averbeck & Hample, 2008), Averbeck (2015) recently investigated the reasons why an ironist may choose to withhold or suppress an ironic comment. In particular, the author considered three conditions upon which an argument may be suppressed: effectiveness, person-centered, and discourse concerns, asking participants to complete the editorial standards checklist (Hample & Dallinger, 1987b). When an argument is suppressed because of effectiveness concerns, the ironist believes that the argument will not work because of its negativity. When an argument is suppressed because of person concerns, the ironist believes that the argument negatively presents the self, the relational partner, or their relationship. When an argument is suppressed because of discourse concerns, the ironist believes that relevance and truthfulness of the argument is not adequate (Averbeck, 2015). In this perspective, irony would be chosen to persuade the receiver to no longer engage in a behavior or no longer hold an attitude which is perceived to be outside of norms, attitudes, and beliefs mutually shared (Kaufer & Neuwirth, 1982).

In this chapter we argue that by using an ironic argument, a speaker does not simply want to persuade the addressee, but rather she wants to persuade the addressee in a particularly forceful way, via an emotionally loaded *reductio ad absurdum* of the addressee's point. The main claim of the chapter is that the specific argumentative force of the *reductio ad absurdum* in an ironic argument depends on the affective component of the communicative act in general and on the positive/negative valence of the attitude in particular. Therefore, the experiment intends to specifically investigate the affective aspect of ironic arguments production, to understand whether and when a speaker may choose to adopt or suppress this indirect argumentative strategy. Interestingly, the results of previous studies (Averbeck, 2010, 2015) show that the concerns for the partner were greater than concerns for the self and the relationship. Participants were asked to choose whether they would endorse an ironic argument or suppress it on the basis of these concerns. However, the participants were asked to judge on the basis of "already-made" literal vs. ironic comments, they were not asked to produce the arguments. This pilot study aims instead to directly test *the affective aspects of ironic arguments production*, asking participants to choose whether or not to implicitly produce, in a given set of contextual premises, an ironic comment based on its affective charge. Beyond finding out whether the irony producers will take the addressees'

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perspective, the empirical study aims to understand whether the irony producers would revise their non-sarcastic vs. sarcastic ironic arguments when put on the addressee's side.

4.2 Hypotheses

H1: The first hypothesis of the experiment is that the ironic arguments that are not produced are suppressed because they are deemed not to be nice for receivers and will have unacceptable affective consequences on the (imagined) relationship, when compared to literal arguments that are instead produced. It is expected that the suppression of the ironic argument is greater in case of sarcasm, where the victim is explicitly targeted.

The experiment also aims to test whether the acceptability of the ironic argument changes when the participants no longer produce irony according to its affective component, but receive their own argument with the same affective attitude. Indeed, putting the irony producer on the other side of communication, the producer might evaluate the same ironic argument as more acceptable from an affective point of view, because she no longer has concerns about the emotional effects of ironic arguments on the receivers.

H2: The second hypothesis is therefore that people paid more attention to the affective load they attached to the propositional content of the ironic arguments they produce compared to the affective load attached to the propositional content of the ironic arguments they receive. It is therefore expected that participants are more emotionally prone to receive rather than produce ironic arguments, especially in ironic set of contextual premises where they are not explicitly targeted.

4.3 Participants

Thirty participants (15 males and 15 females), graduate students from the University of Cagliari, completed the pilot study. All participants reported Italian as their first language, and the mean age was 28.13 (SD = 6.35).

4.4 Materials

Irony has been described as a "polarity reverser" with respect to the affective charge of the words used in a comment (Capelli, Nakagawa & Madden, 1990). From this point of view, irony simply reverses the valence of the target word in the ironic comment. However, other studies (Filik, Hunter & Leuthold, 2015; Filik et al., 2017) suggest that this specific ironic effect may not be a word-level phenomenon, because it has an impact on the wider context, where the ironic comment is produced. More specifically, as already pointed out (Pexman & Olineck, 2002; Ivanko & Pexman,

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2003; Dyzman, Rataj & Dylak, 2010), the ironic effect is tightly linked to the interplay between the (positive or negative) valenced target word and the (positively or negatively) valenced context. Therefore, the materials provided to the participants were 12 story sets, each having an emotionally valenced (positive or negative) context, where the main character pronounces a literal vs. ironic comment ending up with an emotionally valenced (positive or negative) target word.

The contexts of the stories provide the arguments with the set of premises (two premises for each context, P1 and P2) and the comments produce either a direct (literal) argument or an indirect (ironic) argument. The comments can be either conclusions of the literal arguments or further premises leading to a *reductio ad absurdum* and entailing the (indirect) conclusions of the ironic arguments. The stories were in Italian, translated, and adapted from a French sample (Ervas, Dyzman & Zalla, 2011), pre-tested in a series of rating studies. In 6 story sets the literal vs. ironic comment was directed towards a situation (non-sarcastic ironic contexts), whilst in 6 story sets the literal vs. ironic comment was explicitly directed towards a person rather than a situation (sarcastic ironic contexts). Therefore, 6 story sets were designed to give the participants the possibility to produce or suppress non-sarcastic ironic arguments and 6 story sets were designed to give the participants the possibility to produce or suppress sarcastic ironic arguments. Sarcastic irony covers the case of ironic praise directed to a person.

Each story set gives therefore four experimental combinations of contexts and comments (see example in Table 1 for non-sarcastic ironic contexts and in Table 2 for sarcastic ironic contexts): (1) Literal praise (positive context/positive comment), where the producer adopts an explicit, positive attitude; (2) Literal criticism (negative context/negative comment), where the producer adopts an explicit, negative attitude; (3) Critical irony (negative context/positive comment), where the producer adopts an implicit, negative attitude; (4) Praising irony (positive context/negative comment), where the producer adopts an implicit, positive attitude.

Table 1. Example of story set given by the combination of the contexts (premises P1 + P2) and comments (conclusion C) targeted to a situation (target words in italics)

	Negative comment	**Positive comment**
Negative context	(P1) Robyn and Mark went to the cinema. (P2) The film was boring. (C) Robyn said: "It was so *dreadful*"	(P1) Robyn and Mark went to the cinema. (P2) The film was boring. (C) Robyn said: "It was so *exciting*"
Positive context	(P1) Robyn and Mark went to the cinema. (P2) The film was fascinating. (C) Robyn said: "It was so *dreadful*"	(P1) Robyn and Mark went to the cinema. (P2) The film was fascinating. (C) Robyn said: "It was so *exciting*"

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Table 2. Example of story set given by the combination of the contexts (premises P1+P2) and comments (conclusion C) targeted to a person (target words in italics)

	Negative comment	**Positive comment**
Negative context	(P1) Tom and Ken took part in a race. (P2) Ken crossed the finishing line last. (C) Tom said: "You're so *slow*"	(P1) Tom and Ken took part in a race. (P2) Ken crossed the finishing line last. (C) Tom said: "You're so *fast*"
Positive context	(P1) Tom and Ken took part in a race. (P2) Ken crossed the finishing line first. (C) Tom said: "You're so *slow*"	(P1) Tom and Ken took part in a race. (P2) Ken crossed the finishing line first. (C) Tom said: "You're so *fast*"

Materials also included other 2 story sets, which were used as a practice block to instruct participants to perform the task of argument production, and other 8 story sets, which were used as fillers (different from the 12-story sets).

4.5 Rating studies

The story sets were pre-tested according to the features of 1) the target words of the stories (word length and frequency; word valence and familiarity) and 2) the contexts of the stories (context length and valence; expectancy for the last word in the context). For the words and contexts length, respectively the number of characters and the number of words were checked. The target words were also checked for their frequency in the Italian GRADIT (De Mauro, 2000). The main experiment on irony production was therefore preceded by three rating studies. In the first rating study a group of 30 participants (15 males and 15 females) were asked to judge valence (emotional meaning) and familiarity of the target word and valence of the contexts on 7-points scale in two dimensions (1 = very negative / 7 = very positive; 1 = at all unfamiliar / 7 = very familiar). Target words might have been selected by adopting other psycholinguistic measures, as for instance arousal and dominance (Warriner, Kuperman & Brysbaert, 2013), but they were selected on the basis of their valence to understand the polarity of the ironic attitude. This is anyway a limitation of the pilot study, which should be taken into account for further empirical research.

In the second rating study a group of 30 participants (15 males and 15 females) were asked to complete each story with one word that first comes to their mind (*cloze test*). The third rating study was designed to test the comprehension of the intended (literal vs. ironic) meaning, and the perception of the social and affective

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aspects of irony in the different combinations contexts/comments of the story sets. Another group of 30 participants (15 males and 15 females) was presented with all the possible combinations and asked to evaluate whether the comment was literal or ironic. As to the perception of the social and affective aspects of irony, participants were asked to respectively evaluate whether the comment was polite or impolite, nice or mean. Interestingly, the rating studies showed that praise irony is more difficult to detect when compared to critical irony ($p < .005$), thus confirming the results of previous studies (Kreuz & Link, 2002; Langdon, Davies & Coltheart, 2002; Bruntsch & Ruch, 2017). Moreover, the positive literal comments were perceived as more polite and nicer when compared to negative literal comments and ironic comments, while the negative literal comments were perceived neither as being more polite nor being nicer when compared to critical irony. On the contrary, praise irony is perceived as both being more impolite and meaner when compared to literal praise. As reported by previous studies (Pexman & Olineck, 2002), critical irony is perceived as more polite than praise irony, because the speaker is indirectly critical, while in praise irony the speaker is making an indirect compliment instead of overtly praising the addressee. It is also noteworthy that in the positive context participants were able to assess the politeness and the niceness of the literal vs. ironic comments, while in negative contexts both literal and ironic critical comments were difficult to assess and perceived to be mean, but polite.

4.6 Method

The empirical study was computer based and divided into two parts with a break of twenty minutes. In the first part of the main experiment, the 12 story sets were presented to the participants in randomized combinations, preceded by one story set of the practice block. The participants were asked to read the context of the story ending with a comment and, after showing them the two possible adjectives to complete the comment as literal or ironic, to select the adjective that made the comment nicer toward the addressee. In the second part of the study, the participants were asked to read the contexts of the 8 "filler" story sets in all randomized combinations (32 comments) preceded by another story set of the practice block. The comments were presented as already completed and produced by other participants. The participants were asked to judge whether the comments were nice toward the addressee, answering "yes" or "no". However, 8 (4 literal and 4 ironic) comments were manipulated: participants were asked to evaluate their own comments produced in the first part of the experiment as if it were someone else's. Across the two experiments, more than half of the participants did not detect this manipulation. The participants who did not detect the manipulation thus evaluated the comments they had produced in the first part of the experiment as if it

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were someone else's. In both parts of the experiment the practice block stories had the aim of helping participants to take confidence with computer and the procedure to execute the task.

4.7 Results

All data analysis were collected in an internet data-base publicly available at: https://xprag.github.io/irony/analysis/. A t-test was performed to determine the statistical significance via SciPy ecosystem (Scientific Computing Tool for Python). As to the first part of the experiment, results show that ironic arguments were in general less produced (16.3%) when compared to literal arguments (83.7%) (MD = 13.47; $SD = 4.58$; $p < .001$). A significant difference of performance was registered between the literal praise condition and the ironic praise condition (MD = 16.69; $SD = 2.28$; $p < .001$) as well as between the literal criticism condition and the ironic criticism condition (MD = 7.56; $SD = 3.12$; $p < .001$). These significant differences are respectively due to the greater number of positive comments when compared to negative comments produced in positive contexts, and to the greater number of negative comments when compared to positive comments produced in negative contexts. A significant difference has been found between positive and negative contexts conditions, due to the fact that literal arguments are produced more in positive than in negative contexts (MD = 2.64; $SD = 2.28, 3.12$; $p = .01$), whereas ironic arguments are produced more in negative than in positive contexts (MD = 2.64; $SD = 3.12, 2.28$; $p = .01$). Not only critical irony, but also literal criticism is significantly produced more than praise irony (MD = 11.27; $SD = 3.12, 2.28$; $p < .001$) (see Figure 1).

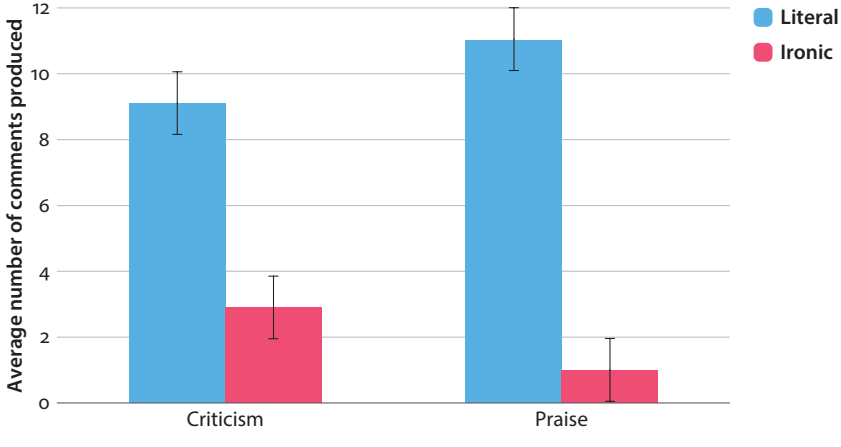


Figure 1. Participants' answers in the production of literal vs. ironic arguments

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No significant difference has been found between literal arguments produced in non-sarcastic vs. sarcastic ironic contexts. Interestingly, a significant difference has been found among non-sarcastic and sarcastic ironic contexts in the production of ironic arguments, due to the fact that participants produce more critical ironic arguments in sarcastic ironic contexts than praise ironic arguments in non-sarcastic ironic contexts (MD = 2.15; *SD* = 1.87, 1.26; $p = .03$).

In the second part of the experiment, only the manipulated comments were analyzed. In those cases, 55.4% of times participants recognized as nice what they have produced as nice, whereas 44.6% of times participants did not recognize as nice what they have produced as nice. Interestingly, participants gave a different evaluation of the arguments they had produced in case of negative contexts (43.3%) rather than in positive contexts (1.3%) (MD = 10.70; *SD* = 1.65, 0.4; $p < .001$). In case of negative contexts, the evaluation of the arguments changed more in case of literal rather than ironic arguments, in both non-sarcastic ironic contexts (MD = 4.89; *SD* = 1.11, 0.71; $p < .001$) and sarcastic ironic contexts (MD = 3.72; *SD* = 0.92, 0.7; $p < .001$). A significant difference was found among non-sarcastic ironic and sarcastic ironic contexts in the evaluation of previously produced critical literal arguments, because participants gave a different evaluation more in non-sarcastic ironic contexts than in sarcastic ironic contexts (MD = 1.74; *SD* = 1.11, 0.92; $p = .04$) (see Figure 2). No significant difference in terms of changed evaluation was found in positive contexts.

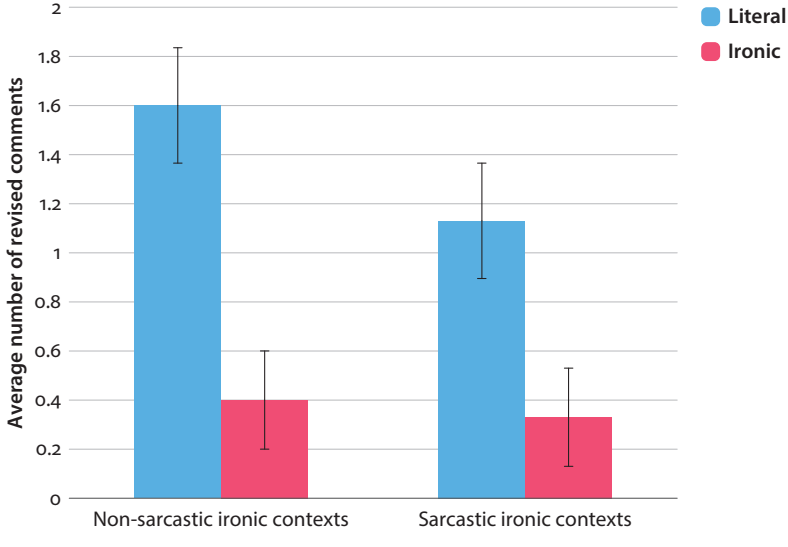


Figure 2. Participants' revision of produced literal vs. ironic arguments in negative contexts

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5. Discussion

The results confirm previous studies, where literal arguments are endorsed more than ironic ones (Kreuz, 1996; Glenwright & Pexman, 2007; Averbeck & Hample, 2008), and seem supportive of the hypotheses on irony processing, such as the Literal First Hypothesis (based on the Standard Pragmatic View, see Grice, 1989) or Graded Salience Hypothesis (see Giora, in this volume), where there is a priority of the literal or default interpretation over the ironic or non-default one. In the case of negative contexts, this might seem counterintuitive: compared to literal criticism, critical irony allows speakers to express hostility in a socially acceptable way. In the perspective of the "Tinge Hypothesis" (Dews & Winner, 1995), ironic criticism is considered as less negative than literal criticism and should therefore be better accepted by the recipient when compared to explicit ways to criticize. Moreover, Averbeck (2010, 2015) shows that the concerns for the partner are greater than concerns for the self and the relationship. In this perspective, we should expect the production of ironic arguments to be more desirable when compared to explicit critical arguments, precisely because of the concerns for the partner. However, the results of this study could underpin other studies (Blasko & Kazmerski, 2006; Bowes & Katz, 2011; Colston, 1997; Kreuz, Long & Church, 1991; Leggitt & Gibbs, 2000; Toplak & Katz, 2000), suggesting that irony, by enhancing the negative emotions felt by the receiver, is perceived in a more negative way, precisely because it is insincere and sneering (Kumon-Nakamura, Glucksberg & Brown, 1995; Okamoto, 2007; Averbeck, 2010). From this point of view, participants might have chosen to produce explicit critical arguments, thus suppressing the ironic ones, precisely because they preferred to directly "tell the truth" as a nicer way to comment on a negative situation instead of producing an insincere and scornful comment (Kreuz et al., 1991; Pexman & Olineck, 2002). In real-life negative context, we would probably prefer to be silent, but if we are forced to choose between literal and ironic criticism, the ironic arguments seem too critical to be produced and thus they might be suppressed.

This is particularly plausible in situations where we do not know the addressee (Dillard et al., 1997) and we do not have enough shared common background to count on. The production of irony depends on the speaker's confidence that the receiver will correctly interpret the utterance and infer the communicative intention (Kreuz, 1996): speaker's confidence increases with the awareness that the receiver actually has the contextual resources to grasp the ironic intention. This might explain why participants suppressed the ironic critical arguments not only in the case of "sarcastic ironic contexts", as expected for partner's concerns, but also in the case of "non-sarcastic ironic contexts", where there is no specific person as target of criticism. In the case of "non-sarcastic ironic contexts", even

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though the affective charge of the argument is not explicitly directed towards the addressee as in sarcasm, the indirect argument needs anyway a set of shared beliefs between two individuals to be understood: such common background makes it more likely that an ironic argument will be understood in the way the speaker intended. Therefore, in the case of "non-sarcastic ironic contexts", participants might have suppressed the ironic critical arguments for discourse concerns, as the contexts were "low common ground situations". As pointed out by Averbeck (2015, p. 104):

> These concerns for common ground and shared experiences help to suppression due to discourse concerns. In low common ground situations, ironic arguments were perceived to be false and irrelevant. Without the common experiences, values, and attitudes, the figurative meaning cannot be inferred from the argument. While the ironic arguments contain a degree of falsehood, this falsehood must be detected for the argument to be understood. If it appears unlikely the receiver would detect the intentional falsehood, then the falsehood of the argument would result in the suppression of the argument.

Defining irony as an indirect argument, the conclusion might be seen as a conversational implicature (Grice, 1989; Sperber & Wilson, 1986/1995) where the premises might be not only the contextual premises (P1 and P2), but also implicit premises coming from the mutually shared knowledge and past experiences. Without these premises an ironic argument could not be effective and relevant to the conversational partner (Averbeck & Hample, 2008; Katz & Lee, 1993; Gibbs, 2000). The explicitness of the literal critical argument might instead oblige the speaker to justify her position in some way, thus engaging the partner in the conversational construction of a (new) common background.

The suppression of ironic arguments, no matter whether in non-sarcastic or sarcastic ironic contexts, is even more pronounced in case of praise irony, as the alternative is an overtly literal compliment. Previous literature on argumentation shows that the "confirmation bias" or "myside bias" is a widespread trait of argument production (Wason, 1966; Wason & Johnson-Laird, 1972; Nickerson, 1998): it is easier to produce an argument on something you agree on and that overtly and widely confirms your own (prior) beliefs. Moreover, praise irony is recognised to be less frequent and less prototypical (Kreuz & Link, 2002; Hutcheon, 1994), as well as more difficult to understand when compared to critical irony (Langdon, Davies & Coltheart, 2002; Bruntsch & Ruch, 2017). The results of this pilot study confirm that praise irony is less produced when compared not only to its praise literal counterpart but also to critical irony. In irony production, participants produced even more critical ironic arguments in sarcastic ironic contexts (where the target of criticism is a person), than praise ironic arguments in non-sarcastic

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ironic contexts (where the target of criticism is a situation). It can be argued that an ironic praising argument is not meant to confirm the producer's opinion on something she agrees on, as in the case of a literal praising comment, but rather to engage the receiver in humorous socializing, flirting, or simply entertaining (Keltner et al., 2001; Bruntsch & Ruch, 2017). Moreover, praise irony as an indirect argument to persuade someone else to follow a norm or a "correct" behaviour does not seem to work (Kumon-Nakamura, Glucksberg & Brown, 1995; Utsumi, 2000; Garmendia, 2014; Averbeck, 2015), because, in the case of ironic compliments, the norm violation is harder to recognize compared to critical irony. Therefore, the speaker would incur a risky "no-point" argumentative strategy by producing ironic praise. As reported by Wilson (2013), this asymmetry between ironic criticism and ironic praise would be reduced when preceded by a self-critical remark, as a cue for the ironic echo of a norm in compliments (Kreuz & Glucksberg, 1989; Glenwright & Pexman, 2007; Pexman, 2005; Filippova & Astington, 2010). From an argumentative perspective, the possibility to echo a norm would make ironic praising argument less risky and easier to understand, because the receiver could exploit the premises of the indirect argument and/or the implicit premises coming from the shared common background. Moreover, it has been argued that the role of emotional intelligence would be fundamental to detect this type of irony. In particular, emotional stability is a personality trait strongly correlated to ironic compliments understanding (Bruntsch & Ruch, 2017): "emotionally stable individuals have a higher readiness to reject the uttered criticism in what is literally said and recognize the more benevolent nature of what is ironically implied in the ironic praise items, compared to individuals low in emotional stability (who in turn may not "get over" the criticism or insult uttered in ironic praise)". A wider shared background of the target of irony would be needed for the production of irony: especially in the case of praising comments, the speaker's confidence and willingness to produce ironic arguments increase with the awareness that the receiver does not merely know the contextual premises but also have the affective intelligence resources to properly infer the communicative intention.

Interestingly, the participants' evaluation of the affective charge of the arguments changes when they find themselves on "the other side" of the communicative act, as they are the receiver of the comment and no longer the producer. This is particularly so in case of negative comments pronounced in negative contexts, where they no longer perceive the "niceness" of the literal direct criticism in terms of truthfulness. Instead, the negative emotional charge might now influence their (revised) evaluation (Infante et al., 1990; Ito et al., 1998; Rozin & Royzman, 2001; Ito & Cacioppo, 2005). Of course, when they are the target of the criticism instead of the producer, the emotional (negative) charged of the comment is perceived as stronger. Being in the shoes of the receiver, they change their mind especially in the case of non-sarcastic ironic contexts rather than sarcastic ironic contexts, where

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they are the target of the criticism. In the case of non-sarcastic ironic contexts, the receiver needs to infer that she might be the target of the message while, in the sarcastic ironic contexts, she is directly identified as the target of the critical argument (Giora, 1997; Giora, Fein, & Schwartz, 1998). Even though the negative affective charge of the argument is perceived as stronger when you receive the literal critical argument than when you produced it, nonetheless a receiver might prefer the truthful and sincere literal negative comment instead of the more scornful ironic comment with its "overt untruthfulness" (Dynel, 2014). This is particularly so when compared to an ironic situation where the receiver is not directly criticized and the ironic indirect argument might be more acceptable and even desirable for her.

We can still wonder why a large number of participants drastically changed their mind between the first and the second evaluation of the same argument. An interesting answer might come from recent studies in the framework of the argumentative theory of reasoning (Mercier & Sperber, 2011), which identifies the function of reasoning in the production and evaluation of arguments in communication. The authors show that many biases or errors of reasoning are less puzzling when considering reasoning as an argumentation instrument in social dynamics and dialogical contexts. For instance, confirmation bias is seen as a natural strategy: if people are trying to convince others they must look for arguments and evidence to support their prior beliefs and decisions. When people are in egalitarian groups and they are aptly stimulated, the performance in the production of arguments is indeed quite good; however, they do much better in the evaluation of others' arguments (Trouche et al., 2016). As previous research shows (Evans et al., 1983; Ball et al., 2006; Ervas, Ledda & Pierro, 2016; Ervas et al., 2018), there is a contrast between the logic of argumentation and the beliefs of the arguer (even when experts are logicians). When participants evaluate arguments whose conclusion they agree with, they tend to accept the arguments without paying too much attention on the validity of the argument, while when they evaluate arguments whose conclusion they disagree with, they tend to be more critical. However, when they produce arguments, they are not so critical. As noted by Trouche et al. (2016, p.13), this is "easily explained by the fact that when reasoning produces arguments for one's position, it is automatically in a situation in which it agrees with the argument's conclusion". In light of the argumentative theory of reasoning (Mercier & Sperber, 2011, 2017), opening a discussion by producing a relatively weak argument is a less risky strategy: "it saves the trouble of computing the best way to convince a specific audience, and if the argument proves unconvincing, its flaws can be addressed in the back and forth of argumentation" (Trouche et al. 2016, p. 13).

In the case of irony production, the ironic argument aims at persuading with a particular force, coming from the argument being indirect, a *reductio ad absurdum*, and from its affective charge. Compared with a literal argument, an ironic

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argument is very difficult to grasp and prone to misunderstanding. Therefore, in the case of a literal, plain, and direct argument, the possibility to have "confederates" is higher and more realistic in the continuation of the dialogue, which allows the receiver to counter-argue and the speaker to refine the argument in appropriate ways. It is instead more difficult to emotionally maintain the relationship and refine the argument when the receiver feels mocked and needs to find on her own further premises to counter-argue the argument she disagrees with. The results of the pilot study indeed support the idea that participants avoid critical ironic arguments, thus producing literal arguments, independent of the target (non-sarcastic ironic vs. sarcastic ironic contexts). Instead, while evaluating the same critical arguments as if they were someone else's, participants prove to be more prone to accept than produce critical ironic arguments, especially in non-sarcastic ironic contexts where they are not the explicit target of irony. In such situations, they reverse the affective evaluation they gave to the critical comment that was produced by themselves in the first part of the study. Thus, in the role of receivers, participants revise their previous evaluation on the affective charge of the criticism according to the target (non-sarcastic ironic vs. sarcastic ironic contexts). In the case of sarcastic ironic contexts, the participants still prefer literal criticism when compared to non-sarcastic ironic contexts, probably because they are more emotionally involved and are less prone to accept indirect mocking strategies. In the case of non-sarcastic ironic contexts, participants are more willing to accept the indirect criticism and its affective charge, probably because they feel more able to emotionally manage the disagreement in a continuation of the dialogue. After all, in such situations, they are not defending themselves as explicit target of the criticism but instead arguing against the speaker's defense of a norm or an expected behavior. In the case of praise comments, on the contrary, the participants did not change their mind regarding their previous evaluation as producers, probably because they simply agree with the praising comments and the confirmation bias strongly acts as "inhibitor" for counter-arguments.

6. Conclusion

In interpersonal communication people care a lot about emotional contents (Dyzman, 2012), but they care as well about critical disagreement (Mercier & Sperber, 2011, 2017). These two aspects significantly interact in both irony production and understanding, intertwining the affective and the cognitive charge of ironic arguments. In irony production, people especially care about their interlocutors' feelings thus suppressing ironic arguments, even preferring negative literal arguments which, even though critical, are perceived as more truthful and

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less hurtful toward the addressee. Literal critical arguments have more chance to maintain the relationship from an affective point of view, when compared to critical ironic comments, whose scorn is more likely to cause a breakdown in interpersonal ties. Also, being explicit and easier to understand, literal critical arguments can be addressed by an eventual counter-argument of the receiver while ironic critical arguments are *reductio ad absurdum* which leave little or no room for a receiver's counter-argument. Arguing helps people reconcile their differences of opinion (van Eemeren & Grootendorst, 1992, 2004; Walton, 1998; Walton & Krabbe, 1995), but reconciliation may fail to happen. As Bowes and Katz (2011) convincingly argued, both closeness and the likelihood of resolution (the "friendship-resolution" factor) are important factors to produce irony. Since disagreement might instead escalate, speakers should be (and are) careful in putting forward an argument (Paglieri, 2009). Especially under uncertainty on the actual receiver's feelings and shared knowledge, they would search to have adequate rather than optimal accuracy in producing arguments based on their behavioral predictions (Wright & Dawson, 1988), thus producing weaker arguments. Irony, as an indirect argument strategy, that aims at persuading others with a particular affective force, would be therefore suppressed. On the contrary, when people are on the receiver's side, "confirmation bias" strongly influences their evaluation of the affective charge of the critical arguments, especially in case of praise irony. If they are the explicit target of the criticism, they still prefer the "truthfulness" of the literal, otherwise they digest the criticism better and possibly counter-argue, by resorting to further implicit premises of the ironic argument in the mutually shared context.

In narrow contexts, as those examined here, exploiting social stereotypes might be a way to "increase" the mutually shared knowledge and modulate both the affective charge and disagreement involved in irony (Cocco & Ervas, 2012; Ervas, Dyzman & Zalla, 2011). Further research on the intertwining of the affective aspects of irony and the argumentative strategies to deal with disagreement should consider more "ecologically valid" contexts, where participants might have a wider shared background and thus might recognize more nuanced feelings, not immediately reducible to the positive vs. negative valence distinction. As pointed out (Langlotz & Locher, 2013), emotional reactions are not always spontaneous because they might be modulated by social and cultural norms of display. In light of the present study, emotional reactions might also be modulated by an epistemic disagreement. Further research should assess whether and when some emotional cues can be strategically used in the indirect ironic argument to give a particular force to a message in the absence of actual arousal, as if the speaker were "on a stage". As this study shows, the affective aspects of irony influence the argumentative process in different ways, precisely because of their evaluative dimension. Even though ironic arguments, unlike other argumentative strategies, are less

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frequently employed in everyday conversations, it needs to be "firmly examined if we hope ever to understand fully how we communicate and reason" (Tindale & Gough, 1987, p. 14).

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How defaultness shapes our language production

A usage-based study of discoursal resonance with default interpretations of metaphor and sarcasm

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The paper focuses on discourse production. It shows that language production unfolds via resonating (Du Bois, 2014) with default interpretations. Default interpretations are defined as automatic responses. However, for an automatic response to be considered a default, it has to be (i) novel; (ii) free of semantic an omaly (Beardsley, 1958) and internal incongruity (Partington, 2011); and (iii) free of contextual information, intonation, discourse markers, etc. Results show that constructions, shown to be interpreted sarcastically or metaphorically when in isolation, were processed faster than nondefault counterparts when in discourse. As a result, corpus-based studies, displaying default interpretations, show that speakers' discourse is unfolding via utterances' default rather than nondefault interpretations. This applies here to Hebrew but also to English, German, and Russian.

Keywords: discourse production, default interpretations, nondefault interpretations, processing, sarcasm, metaphor, literalness, negative, affirmative, corpus-based studies

1. Introduction

This article focuses on default constructed *interpretations* (rather than coded *meanings*) and the way defaultness shapes our discourse production. It presents the Defaultness Hypothesis (Giora, Givoni, & Fein, 2015c), and tests its predictions with regard to the crucial involvement of default interpretations in the way discourse unfolds. Within the framework of the Defaultness Hypothesis, defaultness is defined in terms of an unconditional, automatic response to a stimulus. Still, for an automatic response to be considered a **default**, utterances must meet the conditions for default (even if constructed) interpretations, which guarantee

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that potential ambiguity between literal and nonliteral alternatives is allowed a priori, so that items' preferred interpretation is allowable unconditionally (see 1.1 below).[1]

1.1 Conditions for interpretations' defaultness: Which kind of responses would be definable as default outputs

For an interpretive preference, whether literal or nonliteral, to be allowed a priori:

a. utterance familiarity should be avoided, so as to block stimuli's (literal or nonliteral) responses coded in the mental lexicon (see Giora 1997, 2003), allowing, instead, for their interpretive construction. And when negation is involved, negative items should not be Negative Polarity Items but should have an acceptable and meaningful affirmative counterpart, so that conventionality is avoided;
b. additionally, utterance internal cues, such as semantic anomaly or internal incongruity, should be avoided, given that they prompt nonliteral interpretations (see e.g., Beardsley, 1958; Partington, 2011);
c. furthermore, utterance external cues, such as specific contextual information, intonation, discourse markers, etc., should be excluded, so as to avoid biasing a response preference. (For a full list of constraints on such biases, see e.g., Giora et al., 2015c).

1.2 The defaultness hypothesis – predictions

i. Defining defaultness in terms of an unconditional, automatic response to a stimulus, the Defaultness Hypothesis predicts the speed superiority of default yet novel responses over equally novel nondefault counterparts (established as such by a pretest), regardless of degree of figurativeness (literal – figurative), degree of negation (negation – affirmation), degree of novelty (salience-based – nonsalient, see Giora 2003), or degree of strength of contextual support (weak – strong).
ii. Based on the expected speed superiority of defaultness, the Defaultness Hypothesis further predicts the predominant effect of default compared to nondefault responses on shaping discourse production. In particular, if prior

1. Note that defaultness is a matter of degree as there are default, less-default, and nondefault interpretations. So far, though, we have only studied default and nondefault counterparts, as they are statistically distinguishable. See, however, Veale's (2018) corpus-based study for results attesting to the gradedness of defaultness.

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and/or upcoming contextual environment of stimuli resonates with their responses, it will reflect and resonate with their default rather than nondefault outputs, irrespective of degree of figurativeness or contextual fit[2] (Giora, Drucker, & Fein, 2014a; for the full range of predictions following from the Defaultness Hypothesis, see e.g., Becker & Giora, 2018); Filik, Howman, Ralph-Nearman, & Giora, 2018; Giora, 2021; Giora, Givoni, & Becker, 2020; Giora, Cholev, Fein, & Peleg, 2018; Giora et al., 2015c; Giora, Givoni, Heruti, & Fein, 2017; Giora, Jaffe, Becker, & Fein, 2018; Giora, Livnat, Fein, Barnea, Zeiman, & Berger, 2013; Giora, Raphaely, Fein, & Livnat, 2014b).

According to prediction (ii) of the Defaultness Hypothesis, then, discourse production will be governed by defaultness. Specifically, target utterances' default responses, whether contextually appropriate or not, will feature dominantly in their neighboring utterances, which will resonate with and echo their default (rather than nondefault) interpretations. Indeed, according to Du Bois and Giora (2014), discoursal resonance "arises when a language user constructs an utterance modeled in part on the utterance of a prior speaker or author. Aspects of the prior speaker's words, structures, and other linguistic resources are selectively reproduced by the current speaker" (Du Bois & Giora, 2014: 352). Resonance thus alludes to the "activation of affinities across utterances uttered within and between speakers, appearing in both prior and future context (Giora 2007)", including that of the speaker's herself, while not repeating the utterance referred to (Du Bois, 2014; Du Bois & Giora, 2014: 352; Giora, 2007). Here, however, I will show that resonance itself is governed by defaultness, resulting in discourse production mirroring affinities among default (rather than nondefault) responses.

The focus in this study is on default *figurative* language, varying between metaphorical and sarcastic interpretations.[3] What is actually tested here is prediction (ii) of the Defaultness Hypothesis, expecting default interpretations to shape discourse production via discoursal resonance with these interpretations.

However, before testing prediction (ii), regarding contextual resonance with targets' default interpretations, it is necessary to test prediction (i), related to the speed superiority of default over nondefault interpretations, a factor that triggers the predicted role of defaultness in affecting discourse resonance. In Section (2),

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2. Note that default literal interpretations of affirmative metaphor and sarcasm are not suppressed; given that they are functional in constructing the intended interpretation, they are retained, and therefore available for further processes, as shown by Giora, 2003; Giora, Fein, Aschkenazi, & Alkabets-Zlozover (2007); Giora, Fein, Laadan, Wolfson, Zeituny, Kidron, Kaufman, & Shaham (2007)

3. *Sarcasm* refers here to verbal irony.

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then, I review findings supportive of prediction (i), attesting to the speed superiority of default interpretations over nondefault alternatives, regardless of degree of non/literalness, novelty, negation/affirmation, or contextual fit. In Section (3), I present findings supportive of prediction (ii), whereby it is resonance with targets' default interpretations that shapes our language production, regardless of contextual fit, Givoni, & Giora (2018).

2. On the speed superiority of default over nondefault interpretations

2.1 The speed superiority of default metaphorical interpretations of negative constructions over their nondefault literal counterparts

To test the prediction of the Defaultness Hypothesis regarding the speed superiority of default over nondefault responses, Giora, Fein, Metuki, and Stern (2010) first established degree of defaultness by probing negative and affirmative items (meeting conditions a-c above) for degree of defaultness.[4] Results showed that, when presented in isolation, the preferred interpretation of the novel negative items ("You are not my boss") was metaphorical (*stop telling me what to do*, i.e., 'don't behave like you are my boss, because you are not'); their nondefault nonpreferred interpretation was literal (*I work for someone else*, i.e., 'another person is my boss'). In contrast, the default preferred interpretation of their equally novel affirmative counterparts ("You are my boss") was literal (*I work for you*); their nondefault nonpreferred interpretation was metaphorical (i.e., 'although you are not literally my "boss", in my eyes you are my boss, so *I will do what you tell me to do*').

Once degree of defaultness was established, Giora et al. (2013) weighed the processing speed of default vs. nondefault interpretations of negative items, embedded in equally strong contexts, supportive of their respective interpretations.[5] Results attested to the speed superiority of default over nondefault interpretations. Specifically, default negative metaphors were processed faster than nondefault negative literals.

Having established the speed superiority of default negative metaphors over nondefault negative literals (as predicted by (i) above), prediction (ii) of the Defaultness Hypothesis is tested in Section (3), expecting targets' environment

4. Items in all our experiments were in Hebrew.

5. In all the experiments reported here, equal degree of items' novelty, degree of defaultness, and equal strength of contextual support were established by pretests.

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to resonate with their default (metaphorical) rather than nondefault (literal) interpretations.

2.2 The speed superiority of default sarcastic interpretations of negative constructions over their nondefault literal counterparts

To further test prediction (i) of the Defaultness Hypothesis, regarding the speed superiority of default over nondefault responses, in Giora et al. (2013), we first established degree of defaultness by probing negative utterances ("Ambitious she is not") when presented in isolation. Results showed that the negative targets were interpreted sarcastically, scoring high on sarcasm, significantly higher than 5 on a 7-point sarcasm scale. We then rated their degree of sarcasm when weighed against their affirmative counterparts ("Ambitious she is yes").[6] Results showed that the novel negative items were rated as more sarcastic than their equally novel affirmative counterparts; these results established the defaultness of the sarcastic interpretation and the nondefaultness of the literal interpretation of the **negatives**, on the one hand, and the defaultness of the literal interpretation and the nondefaultness of the sarcastic interpretation of the **affirmatives**, on the other.

Once degree of defaultness was established, Giora et al. (2013) measured the processing speed of default vs. nondefault interpretations of the negative items ("Ambitious she is not"), embedded in equally strong contexts, supportive of their default (sarcastic) and (nondefault) literal interpretations. Results attested to the speed superiority of defaultness over nondefaultness. Specifically, default negative sarcasm was processed faster than nondefault negative literalness.

Giora, Drucker, Fein, and Mendelson (2015a) studied another construction (X is not her/his forte; X is not her/his best attribute). As in Giora et al. (2013), when in isolation, results show that the default interpretation of the novel negative items ("Intelligence is not his forte/strong attribute") is sarcastic (meaning *he is not intelligent/he is stupid*); the nondefault interpretation of this construction is literal (suggesting *he has stronger attributes*). The default interpretation of the affirmative counterparts ("Intelligence is his forte/strong attribute") is literal (meaning *he is intelligent*); their nondefault interpretation is sarcastic (meaning *he is not intelligent/he is stupid*). Explicit sarcasm ratings further confirmed the defaultness of the sarcastic interpretation and the nondefaultness of the literal interpretation.

Hence, when bedded in equally strong contexts, supportive of their default sarcastic or nondefault literal interpretation, negative items were interpreted

6. These Hebrew affirmative constructions feature an obligatory affirmative marker – "yes."

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sarcastically by default: They were read faster than their equally strong literally biased counterparts.

Note that the above studies further examined the effect of items' structural markedness (X s/he is not; X is not her/his forte/strong attribute) on generating sarcastic interpretations by default. Indeed, results of 2 experiments show that it is negation, strongly **attenuating** highly **positive** concepts, that affects sarcasm interpretation by default, even when items are structurally unmarked (as in *His/her forte is not Y*; e.g., *His forte/strong attribute is not Intelligence*; see also Giora, 2021).

Giora et al. (2015c) also tested the predictions of the Defaultness Hypothesis, using, this time, a 4-way pattern of comparisons, aiming to show that defaultness reigns, regardless of degree of negation/affirmation, degree of novelty, degree of nonliteralness, or degree of contextual strength. To do that, we first established degree of defaultness of negatives and affirmatives when presented in isolation. Results showed that the default interpretation of novel negative utterances ("He is not the most mesmerizing actor", meaning *he is boring*) was sarcastic; their nondefault interpretation (*others were more exciting*) was literal. The default interpretation of their novel affirmative counterparts ("He is the most mesmerizing actor", meaning *he is exciting*) was literal; their nondefault interpretation was sarcastic (meaning *he is boring*). This was further confirmed by an explicit sarcasm rating experiment.

To test prediction (i), related to the speed superiority of default over nondefault interpretations, Giora et al. (2015c) embedded negative and affirmative items in contexts equally strongly supportive of their respective (sarcastic or literal) interpretations. Results showed that:

a. As predicted, *default* negative sarcasm, embedded in sarcastically biasing context, was processed faster than *nondefault* negative literalness, embedded in equally strong, literally biasing context, and faster yet than *nondefault* affirmative sarcasm, embedded in equally strong, sarcastically biasing context.
b. Similarly, *default* affirmative literalness was processed faster than *nondefault* affirmative sarcasm, embedded in equally strong, sarcastically biasing context, and faster yet than *nondefault* negative literalness, embedded in equally strong, literally biasing context.

Defaultness, then, rules; it supersedes all factors known to affect processing such as negation, novelty, nonliteralness, or strength of contextual support.

Having established the speed superiority of default negative sarcasm over nondefault negative literalness and over nondefault affirmative sarcasm, alongside the speed superiority default affirmative literalness over nondefault affirmative sarcasm and over nondefault negative literalness, in Section (3) below, prediction

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(ii) of the Defaultness Hypothesis will be tested. Accordingly, targets' environment is expected to resonate with default rather than nondefault interpretations, whether literal or nonliteral, contextually appropriate or inappropriate.

2.3 The speed superiority of default literal interpretations of affirmative sarcasm over their nondefault literal counterparts

There is plenty of evidence attesting to the speed superiority of default (often literal) interpretation of affirmative sarcasm, despite contextual support to the contrary, as anticipated by prediction (i). For instance, in Giora et al. (2015c), pretests first established the defaultness of the novel literal interpretations of affirmative utterances ("He is the most mesmerizing actor", meaning *he is exciting*) and the nondefaultness of their equally novel sarcastic counterparts (meaning *he is boring*). Hence, when embedded in equally strong contexts, supportive of their respective interpretations, default affirmative literalness was processed faster than nondefault affirmative sarcasm.

Fein, Yeari, and Giora (2015) and Giora, Fein, Laadan, Wolfson, Zeituny, Kidron, Kaufman, and Shaham (2007) further show that, no matter how strong contextual bias is, whether supportive of the default literal or the nondefault sarcastic interpretation of the affirmative targets, it is always the default literal interpretation that is activated initially, even when contextually inappropriate.

This was also true of familiar affirmative ironies (as shown by e.g., Giora & Fein, 1999). Given that both, familiar ironies have 2 default meanings, figurative and nonfigurative, they both get activated initially, regardless of context fit (for more evidence see Giora, 2003 and references therein).

2.4 The speed superiority of default literal interpretations of affirmative metaphors over their nondefault literal counterparts

The speed superiority of default contextually inappropriate literal interpretations of affirmative metaphors has also been attested to by e.g., Giora & Fein (1999), Giora, Fein, Kotler, and Shuval (2015b), Giora, Fein, Kronrod, Elnatan, Shuval, & Zur (2004), or Pexman, Ferretti, & Katz (2000). Given that novel metaphors have one default (often literal) interpretation, this interpretation was activated initially when processing speed was measured. And although default meanings of familiar stimuli are not within the scope of this discussion, it is worth mentioning that familiar metaphors, which have two default, coded meanings – figurative and nonfigurative, involve activating both of them initially, regardless of context fit (as shown by e.g., Giora & Fein 1999).

Is it possible that both default and nondefault responses to the same stimulus be figurative? In Gibbs (1998), the default metaphorical "This one's really sharp"

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(meaning *The student is highly intelligent*), embedded in metaphorically biasing context (see Example (1) below), is further embedded in a sarcastically biasing context (see Example (2) below), resulting in a novel nondefault sarcastic interpretation (meaning, *this pair of scissors is blunt*). However, in Colston & Gibbs (2002), the context of the metaphorical *sharp*, referring to an intelligent student, is now presenting a student that is far from being intelligent, thus rendering sarcastic the default metaphorical target, whereby the student is ridiculed (meaning, *she is stupid*, see Example (3) below):

(1) You are a teacher at an elementary school.
You are discussing a new student with your assistant teacher. The student did extremely well on her entrance examinations. You say to your assistant,
This one's really sharp.

(2) You are a teacher at an elementary school.
You are gathering teaching supplies with your assistant teacher. Some of the scissors you have are in really bad shape. You find one pair that won't cut anything. You say to your assistant,
This one's really sharp.

(3) You are an assistant to a teacher at an elementary school, and the two of you are discussing a new student.
The student did extremely poorly on her entrance examination.
The teacher said to you: "This one is really sharp."

Measuring reading times of targets in all these conditions, revealed that nondefault sarcastic responses took longer to process than default metaphorical counterparts, despite their equal share of nonliteralness (see also Pexman et al., 2000). Such results suggest that literal and nonliteral responses are involved in processing nondefault nonliteral counterparts on account of their defaultness. It is not degree of non/literalness or contextual fit that matters, but degree of defaultness.

2.5 The speed superiority of default over nondefault counterparts is insensitive to degree of figurativeness

Although the topic of this paper relates to default and nondefault nonliteral *interpretations* rather than default coded *meanings*, it is still necessary to highlight the fact that, as predicted by the Defaultness Hypothesis, default responses, whether familiar or unfamiliar, enjoy priority over nondefault counterparts, regardless of degree of non/literalness. As an aside, then, consider the case of the novel *nondefault* literal "Know Hope" (which projects optimism). This *nondefault* literal collocation instantly activates its *default*, yet literal counterpart *No hope*, despite its inappropriateness (conveying 'pessimism'). Still these seemingly unrelated responses interact with each other, resulting in a meaningful innovative message.

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Or take the *nondefault* metaphorical "Read my lipstick",[7] which harps on the *default*, yet metaphorical "Read my lips", or the *default* metaphorical "Curl up and die", which is deautomatized by its nondefault literal counterpart "Curl up and dye" (see, Giora, et al., 2004, 2015b), all apparently unrelated to each other, yet they still intertwine, affecting creative messages. In all, such examples, initially activating default even if seemingly irrelevant meanings, result in those meanings partaking in the interpretation process. It is not degree of non/literalness that matters. Instead, it is degree of defaultness that counts.

3. Resonating with default interpretations

3.1 Resonating with default metaphorical interpretations of negative constructions

In this section prediction (ii) of the Defaultness Hypothesis is tested, expecting natural discourse to unfold via echoing or resonating with default rather than nondefault interpretations. Recall that discoursal resonance evolves via activating and retaining affinities across utterances, thus mirroring default (rather than nondefault) responses. In what follows, I present corpus-based data, collected from 8 corpus-based studies, showing that affinities across utterances are governed by defaultness, which plays a crucial role in discourse production. Indeed, our various studies of figurative/literal language use show that, as predicted, default interpretations affect the way discourse production unfolds. However, before looking into discourse resonance with defaultness, it is essential to establish the dominance of defaultness in language use.

3.1.1 *Study 1: Distribution of default negative metaphoricity and default affirmative literalness*

As shown earlier (see Section 2), defaultness supersedes nondefaultness in terms of processing speed, regardless of degree of novelty, nonliteralness, negation, or contextual strength, as predicted by the Defaultness Hypothesis. Therefore, here, prediction (ii), regarding discourse production, is tested. However, before testing prediction (ii), we had to establish, based on language use, the default metaphoricity of negative constructions and the default literalness of their affirmative counterparts. To that end, in Giora et al. (2010), we searched the internet for English, Russian, and German constructions, such as tested earlier for processing speed in Hebrew (see Section 2). We therefore looked at the first ~50 occurrences of targets in both

7. https://www.maggielouiseconfections.com/s/collection/luxe-beauty/read-my-lipstick.html

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their affirmative and negative versions, using engines such as Google, Yahoo, Start, MSN, Walla, and Netex. Ratings of items in terms of degree of metaphoricity were collected.[8] Results showed that negative items in English (see Figure 1), Russian (see Figure 2), and German (see Figure 3) were rated as significantly more metaphorical than their affirmative counterparts, which were rated as literal:

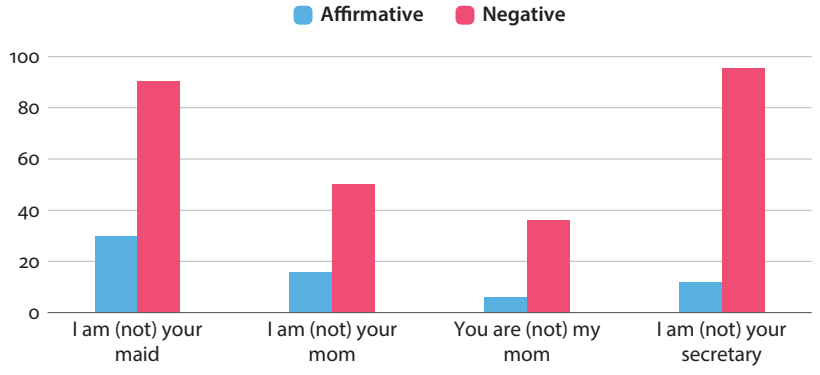


Figure 1. Percentage of metaphorical interpretations of negative vs. affirmative utterances – English data

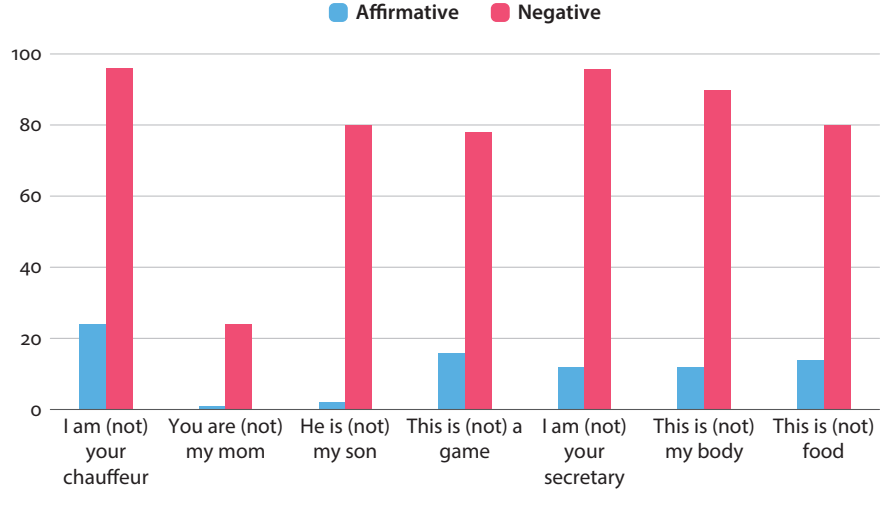


Figure 2. Percentage of metaphorical interpretations of negative vs. affirmative utterances – Russian data

8. Ratings were collected by a native speaker of the relevant language, a student, who is an expert in figurative language, and were further discussed with the author.

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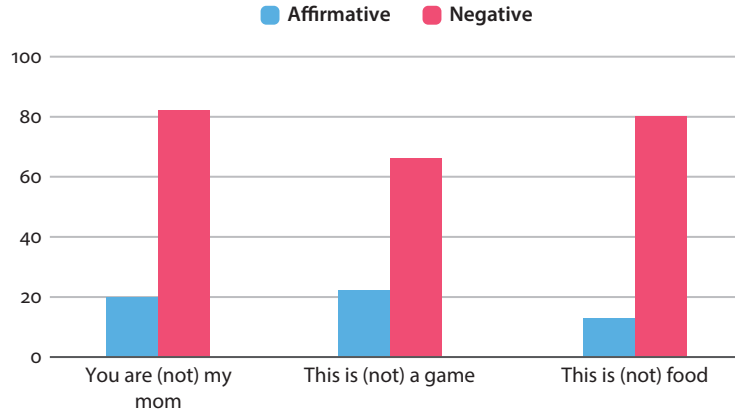


Figure 3. Percentage of metaphorical interpretations of negative vs. affirmative utterances – German data

As shown above, in Giora et al. (2010, 2013), the metaphoricity of the negative constructions was established as their default interpretation, both experimentally and via usage-based studies; examining their affirmative counterparts in the same manner resulted in establishing their literalness as their default interpretation in various languages, such as English, Russian, and German. Such findings allow us to move on to testing prediction (ii), according to which, defaultness plays a major role in shaping resonance in language production (see Section 3.1).

3.1.2 *Study 2: Distribution of type of resonance with default metaphorical interpretations of negative constructions*

Having established the defaultness of the metaphorical interpretation of the negative constructions studied here (see Study 1 above), we expect their environment to resonate with their default metaphorical rather than their nondefault literal interpretation.

To exemplify resonance with default metaphorical interpretations of negative constructions, on the one hand, and nondefault literal interpretations of such constructions, on the other, consider examples (4–5). In (4), the default interpretation of the negative utterance "You are not my boss" is metaphorical. Consequently, this interpretation is reflected by prior and late context via reference to this interpretation (*Don't ever tell me that "I better do something on my blog"; so don't tell me what to write*). In (5), the nondefault interpretation of the negative utterance ("*you're not my boss*") *is literal. Its prior context (I quit) resonates with this nondefault literal interpretation*:

(4) *Don't ever tell me that "I better do something on my blog"*. **You are not my boss***so don't tell me what to write*. (*Joan*, Joan 2008).

(5) "I told you, *I quit*. That means *you're not my boss*". (James, 2015)

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Corpus-based findings regarding the kind of contextual resonance with negative metaphors (of various languages) are presented in Tables 1–3 and Figures 4–5:

Table 1. Distribution of different types of resonance in the environment of ~ 100 negative utterances in English and results of exact binominal probability test for the superiority of metaphorical resonance

English	Only metaphorical resonance	Only literal resonance	Both metaphorical and literal resonance	No resonance	p-values
I am not your maid	61.7% (29/47)	12.8% (6/47)	12.8% (6/47)	12.8% (6/47)	$p < .0005$
You are not my mom	55.6% (10/18)	5.6% (1/18)	27.8% (5/18)	11.1% (2/18)	$p < .01$
I am not your secretary	79.5% (35/44)	4.5% (2/44)	9.1% (4/44)	6.8% (3/44)	$p < .0005$

Table 2. Distribution of different types of resonance in the environment of 138 negative utterances in German and results of exact binominal probability test for the superiority of metaphorical resonance

German	Only metaphorical resonance	Only literal resonance	Both metaphorical and literal resonance	No resonance	p-values
Ich bin nicht deine Mutter (I am not your mom)	58.6% (17/29)	3.5% (1/29)	13.8% (4/29)	24.1% (7/29)	$p < .0005$
Du bist nicht meine Mutter (You are not my mom)	63.4% (26/41)	4.9% (2/41)	17.1% (7/41)	14.6% (6/41)	$p < .0005$
Das ist kein Essen (This is not food)	40% (14/35)	5.7% (2/35)	14.3% (5/35)	40% (14/35)	$p < .005$
Das ist kein Spiel (This is not a game)	54.5% (18/33)	3% (1/33)	15.2% (5/33)	27.3% (9/33)	$p < .0005$

In Figures 4–5 below, "metaphorical resonance" refers to the sum of "only metaphorical resonance" and "both metaphorical and literal resonance"; "literal resonance" refers to the sum of "only literal resonance" and "both metaphorical and literal resonance".

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Table 3. Distribution of different types of resonance in the environment of 70 negative utterances in Russian and results of exact binominal probability test for the superiority of metaphorical resonance

Russian	Only metaphorical resonance	Only literal resonance	Both metaphorical and literal resonance	No resonance	p-values
Я не твоя секретарша (I am not your secretary)	20% (4/20)	5% (1/20)	5% (1/20)	70% (14/20)	$p = .19$
Я не твоя мама (I am not your mom)	12% (6/50)	0% (0/50)	2% (1/50)	86% (43/50)	$p < .05$

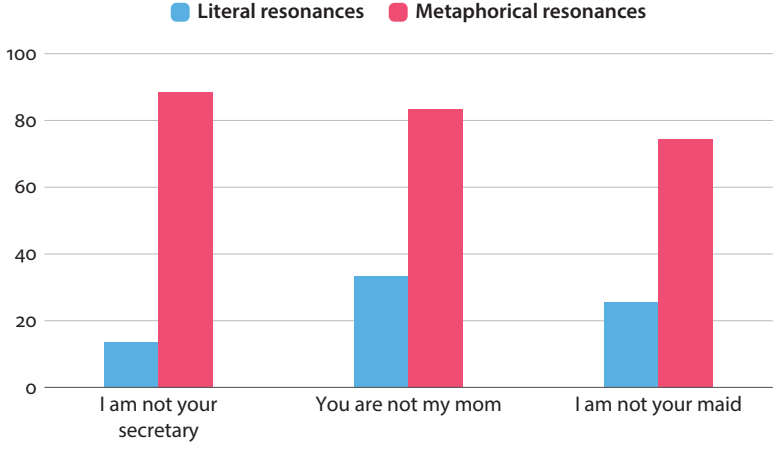


Figure 4. Percentage of metaphorical vs. literal resonance in the environment of negative utterances – English

As shown by both Figures 4–5, the environment of the negative constructions exhibited a significantly higher level of resonance with metaphorical than with literal interpretation.

In sum, as anticipated by the Defaultness Hypothesis (see Section 1), both experimental studies in Hebrew and corpus-based studies in English, German, and Russian attest to the role of defaultness in discourse production. Having established the superiority of default metaphorical interpretations of negative items, such as "You are not my boss", "I'm not your maid", "This is not food", over their nondefault literal interpretations, both in terms of processing speed and natural

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usage (as predicted by the Defaultness Hypothesis), this superiority of default interpretations was tested with regard to prediction (ii), related to discoursal resonance. Indeed, findings show that, as predicted, the discoursal environment of default interpretations of novel negative metaphors of the form X is not Y, involving no semantic anomaly (as per Beardsley 1958) nor internal incongruity (as per Partington 2011), echo and reflect their default figurative interpretation, thus affecting discourse production via discoursal resonance. They show that both, prior and ongoing discourse evolve via activating and retaining affinities across utterances, mirroring default (rather than nondefault) responses.

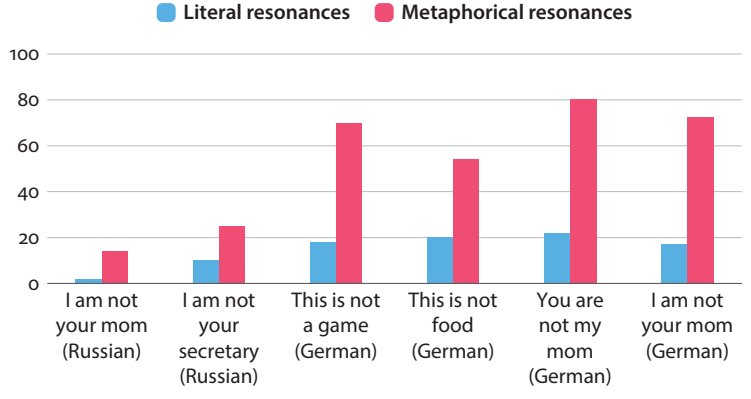


Figure 5. Percentage of metaphorical vs. literal resonance in the environment of negative utterances – German and Russian

3.2 Resonating with default sarcastic interpretations of negative constructions

So far we have seen how default metaphorical interpretations of negative constructions affect language production by triggering contextual resonance with default interpretations. Here we will look into default sarcastic interpretations of negative constructions and the way their environment resonates with these interpretations. As before, here too, I provide corpus-based evidence for the priority of default sarcastic interpretation over nondefault literal counterparts (prediction (i)). Then, I examine the way their discoursal environment resonates with their default interpretation (prediction (ii)).

3.2.1 *Study 3: Distribution of default negative sarcasm and default affirmative literalness of the form X s/he is not*

Having established experimentally the speed superiority of default sarcastic interpretations of negative utterances (of the form "X s/he/it is not") over their

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nondefault literal interpretation (see Section 2.2), in Giora et al. (2013) we further sought to corroborate these online findings with corpus-based data. We therefore studied the first ~50 occurrences of 10 constructions, both in their negative and affirmative versions ("X s/he/it is yes"), using engines such as Google, Zooloo, and Walla. Results showed that most of the negative constructions (95%) were intended sarcastically; their affirmative counterparts were always intended literally (100%). Such findings confirm the defaultness of negative sarcasm and that of affirmative literalness.

Having established the defaultness of the sarcastic interpretation of the negative items, we expect their environment to respond to and resonate with their default (sarcastic) rather than nondefault (literal) interpretation (see Study 4 below).

3.2.2 *Study 4: Distribution of type of resonance with default sarcastic interpretations of negative constructions of the form X s/he is not*

Consider examples (6–7) below. In (6), the target utterance ("Smart she is not") is intended sarcastically; its environment, therefore, resonates with this default sarcastic interpretation (*a walking joke, too stupid, too dumb*). In (7), what is exemplified is resonance with a nondefault literal interpretation of the same sarcastic construction ("Smart it is not"), explicitly addressing *Intelligence* (resulting in creating a pun while resonating with prior context):

(6) A skilled politician wouldn't be instrumental in the death of her own political party, as she certainly is … **Smart she is not**, or she wouldn't be a *walking joke*. The confidence comes from being *too stupid* to know she hasn't got a chance, and fearless only because she's *too dumb* to be embarrassed by her *village idiot* tag. (icurahuman2 in Goldenberg, 2008)

(7) Intelligence": – **smart it is not**[9]

To test prediction (ii) of the Defaultness Hypothesis, expecting default rather than nondefault interpretations to be mirrored by such items' discoursal environment, Giora et al. (2013) examined the contexts of 169 such naturally occurring instances. Results show that, as predicted, the environment of 109 instances were echoed by their environment. Out of these 109, 100 cases (92%) were echoed via their default sarcastic interpretation; only in 9 cases (8%) did the discoursal environment resonate with their nondefault literal interpretation. Additionally, in 23 cases, the environment did not reflect any of the interpretations, while the rest of the cases were reflected by both the default sarcastic and the nondefault literal interpretation. Such findings support the Defaultness Hypothesis regarding the

9. https://www.fxp.co.il/showthread.php?t=14113764 (A review of a series. In Hebrew)

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prevalence of resonance with default rather than nondefault interpretation of negative constructions, such as those studied here.

3.2.3 *Study 5: Distribution of default negative sarcasm and default affirmative literalness of the form X is not her/his forte/best attribute*

Recall that in Giora et al. (2015a; see also Section 2.2), we studied another negative construction (X is not her/his forte; X is not her/his best attribute). Findings showed that the default interpretation of the novel negative items ("Intelligence is not his forte/strong attribute") was sarcastic (meaning *he is stupid*); their nondefault interpretation was literal (suggesting *he has stronger attributes*). In contrast, the default interpretation of the affirmative counterparts ("Intelligence is his forte/strong attribute") was literal (meaning *he is intelligent*); their nondefault interpretation was sarcastic (meaning *he is stupid*). Explicit sarcasm ratings further confirmed the defaultness of the sarcastic interpretation of the negative constructions.

When testing the speed superiority of default negative sarcasm over nondefault negative literalness, negative sarcastic items were faster to read than their equally strongly biased nondefault literal counterparts. Such results support prediction (i) of the Defaultness Hypothesis.

Having established experimentally the defaultness of the negative sarcastic interpretations and the nondefaultness of their literal counterparts, in what follows, predictions (i) and (ii) of the Defaultness Hypothesis are tested, based on natural use. The aim is to reestablish the defaultness of negative sarcasm in natural discourse and further test the way these sarcastic utterances are reflected by their environment.

Following Giora et al. (2014a), prediction (i) of the Defaultness Hypothesis is examined here first, expecting negative constructions ("Intelligence is not his forte/strong attribute") to be predominantly sarcastic when in natural use; their affirmative versions will be mostly used literally, conveying their literal interpretation. To test these predictions, in Giora et al. (2014a) we used a Google search. We collected the first 141 occurrences of negative constructions and the first 155 occurrences of affirmative counterparts, both in Hebrew and English. Results show that (90%) of the negative targets were intended sarcastically; about (97%) of affirmative counterparts were intended literally. Given this support to prediction (i), we move on to testing prediction (ii).

3.2.4 *Study 6: Distribution of type of resonance with default sarcastic interpretations of negative constructions of the form X is not her/his forte/best attribute*

Study 6 tests prediction (ii) of the Defaultness Hypothesis, related to the contextual environment of the negative utterances, shown to convey a sarcastic interpretation

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by default (see Study 5). Will this environment, then, resonate with their default sarcastic interpretation rather than their nondefault literal interpretation? In (8) below, the target utterance ("Patience is not my forte" meaning *I am impatient*) is echoed by references to the default sarcastic interpretation in prior context, indicating speeding up things (*I am a woman who wants everything now*!). In (9) below, however, literal affinities to *patience* in prior context are activated (*calm down and wait; patience*).

(8) *I am a woman who wants everything now*! **Patience is not my forte**.[10]

(9) A lot of people do something like this by sending their dog to his bed to *calm down and wait*, and it does teach them *patience*. I do not know how young you can start with that length of time--Capri was about 5 months when I started with her with decent results (though she is a different dog, and **patience is not her forte**). (mebrod, 2010)[11]

In Giora et al (2014a), the contexts of 127 such naturally occurring negative instances are examined. Findings show that of 83 cases involving resonance, the environment of 73 (88%) resonates with their default sarcastic interpretation; only in 10 cases (12%) does it resonate with the nondefault literal interpretation. Resonance in text production, then, is based on affinities with default interpretations.

3.2.5 *Study 7: Distribution of default negative sarcasm and default affirmative literalness of the form X is not the most Y*

In Giora et al. (2015c), we tested another negative construction of the form "X is not the most/not really/not very/not particularly Y" and its affirmative counterpart ("X is the most/really/very/particularly Y"). Results show that, when out of context, the novel negative items ("He is not the most mesmerizing actor/ He is not really a mesmerizing actor/ He is not a very mesmerizing actor/ He is not particularly a mesmerizing actor") were interpreted sarcastically (meaning *he is boring*), thus establishing the defaultness of their sarcastic interpretation, while further substantiating the nondefaultness of their literal interpretation (*others are more mesmerizing than him)*. Their affirmative counterparts were interpreted literally by default (*he is very exciting*), thus further establishing the nondefaultness of their sarcastic interpretation (*he is boring*). These findings were further corroborated by explicit sarcasm rating. Consequently, when embedded in contexts equally strongly supportive of their respective interpretations, negative sarcasm was faster

10. https://tinyurl.com/y9wgztvw

11. http://www.dobermantalk.com/general-training-obedience/37864-near-misses-obedience-training-lol.html

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to process than negative literalness; affirmative literalness ("He is the most mesmerizing actor") was faster to process than affirmative sarcasm. Usage-based studies by Giora (2021) further corroborate these results. Preliminary results, based on inspecting the Hebrew TenTen corpus (henceforth HeTenTen; see Jakubíček, Kilgarriff, Kovář, Rychlý, & Suchomel, 2013), show that, of the 151 negative constructions surveyed, 72% conveyed a sarcastic interpretation. Such results establish the defaultness of negative sarcasm and the nondefaultness of negative literalness. Based on these results, Giora (2021) further moved on to testing prediction (ii) of the Defaultness Hypothesis, examining the way the discoursal environment of such default and nondefault interpretations relates to these interpretations.

3.2.6 *Study 8: Distribution of type of resonance with default sarcastic interpretations of negative constructions of the form X is not the most Y*

Given the prevalence of the default sarcastic interpretations of negative constructions (see Study 7), Giora (2021), then, set out to test prediction (ii) of the Defaultness hypothesis. Accordingly, the environment of target utterances is expected to resonate with their default rather than nondefault interpretations. Preliminary results indeed show that, of the 151 negative constructions collected, based on searching HeTenTen, 109 were rated as sarcastic; of these 109, 55 were found to be echoed by their discoursal environment. As predicted, in all these 55 (100%) cases, the environment of these utterances resonated with their default sarcastic interpretation only. (For resonance with default affirmative literalness, see Section 3.3)

To exemplify resonance with default sarcastic interpretations of the negative constructions tested here, consider Example (10), in which the environment of the negative targets (["He was] not really kindhearted", meaning *he was cruel*) resonates with its sarcastic interpretation (alluding to even *worse* people):

(10) [He] was nationalist and anti-Semitic **not really kindhearted** although already during his time there were *worse* people than him (originally in Hebrew).[12]

So far I have reviewed findings attesting to dialogic resonance with default, yet contextually appropriate figurative interpretations (for an exception see Section 2.5). This on its own is innovative, given that the metaphorical and sarcastic interpretations of the items tested here are unfamiliar/nonsalient (see also Giora et al., 2015c). Still, it is also necessary to examine resonance with default yet contextually

12. https://tinyurl.com/ya4r6hng

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inappropriate interpretations in order to reduce the possibility that it might be contextual fit rather than defaultness that shapes our text production (via resonance).

3.3 Resonating with default literal interpretations of affirmative metaphor and sarcasm

There is plenty of evidence attesting to the speed superiority of default (often literal) interpretation of affirmative metaphors and ironies, despite contextual support to the contrary, as anticipated by prediction (i). For instance, in Giora et al. (2015c), pretests first established the defaultness of the novel literal interpretations of affirmative utterances ("He is the most mesmerizing actor", meaning *he is exciting*) and the nondefaultness of their equally novel sarcastic counterparts (meaning *he is boring*). Hence, when embedded in equally strong contexts, supportive of their respective interpretations, default affirmative literalness was processed faster than nondefault affirmative sarcasm. This is also true of familiar affirmative ironies (as shown by Giora Fein, & Schwartz, 1998) and of familiar affirmative metaphors (as shown by Giora & Fein, 1999). Given that both, familiar metaphors and ironies have 2 default interpretations, figurative and nonfigurative, they both get activated initially, regardless of context fit.

Fein et al. (2015) and Giora, Fein, Laadan et al. (2007) studied novel noncoded affirmative ironies. They show that, no matter how strong contextual bias is, whether supportive of the default literal or the nondefault sarcastic interpretation of the targets, it is always the default literal interpretation that is activated initially, even when contextually inappropriate (as in the case of the unfamiliar affirmative sarcasm in Giora et al., 2015c. It is not degree of figurativeness or contextual fit that matters, instead it is degree of defaultness that makes a difference.

3.3.1 *Study 9: Distribution of type of resonance with default literal interpretations of affirmative sarcasm*

Given the speed superiority of the default literal interpretation of unfamiliar noncoded affirmative sarcasm, in Giora et al. (2014b) we test prediction (ii) of the Defaultness Hypothesis. According to this prediction, discoursal resonance is expected to relate to default albeit contextually incompatible literal interpretations of affirmative sarcastic utterances rather than to nondefault contextually compatible sarcastic counterparts.

Consider, for instance, Example (11) below. Here, describing hundreds of funerals in Gaza as a token of the "splendid job" "of our fine pilots", although intended sarcastically, in fact, resonates with what is mentioned previously in the context, when the cited speaker genuinely compliments Israeli Air force pilots for doing that "splendid job":

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(11) "Hooray to the Israeli Air Force pilots doing a splendid job" effused Brigadier General Avi Benayahu, the IDF spokesperson, talking to Yonit Levy – white turtleneck against a background of tanks, vis à vis hundreds of funerals in Gaza – a token of the "splendid job" of our fine pilots. (Levy, 2008b).

Harvesting ~1600 instances of affirmative ironies, based on natural language use in newspapers' articles, shows that 46% of them were addressed via reference to their default contextually incompatible literal interpretation; resonance with their nondefault contextually compatible ironic interpretations occurred in 8% of the cases. The environment of the rest either did not resonate with any of their interpretations (43%), or resonated with both their compatible and incompatible interpretations (3%). Such results support the view that, text production involves activating and retaining default albeit contextually inappropriate interpretations.

Resonating with default literal interpretations of affirmative sarcasm, even if incompatible, is significantly more prevalent than with contextually compatible yet nondefault sarcastic interpretations. Defaultness then reigns.

3.3.2 *Study 10: Distribution of type of resonance with default literal interpretations of affirmative metaphors*

Given the similarity between novel and familiar metaphors in terms of activation of default yet contextually incompatible literal responses, attested to by Giora & Fein (1999), Giora & Balaban (2001) aimed to further substantiate that via a corpus-based study. Materials were metaphors collected from newspaper articles. Thirty involved echoing their default literal interpretation, as in (12a,b) below, where "a fight" is echoed by "weapons", and "an island" is echoed by "sea", and 30 did not, as in (13a,b) below:

(12) a. The strikes in the Education system took place when the Union was **putting up a fight** against the government. *In this fight, threats, sanctions and even a general strike were the weapons*. (Ha'aretz, 4.9.97)

b. In this situation, the Treasure looks like **an island of sanity** in a *sea* of unconstrained demands. (Ha'aretz, 12.9.97)

(13) a. He lost his health, and **his spirit broke**. (Ha'aretz, 1.9.97)

b. Every honest and benevolent person should have **given a shoulder** to the minister of Treasure so that he can succeed in implementing his plan. (Ha'aretz, 4.9.97)

Results of familiarity ratings (ranging on a 7-point scale), collected from 40 participants, showed that affirmative metaphors, whose contextually incompatible metaphorical and literal responses were echoed and elaborated on by their following context (see 12a,b), were not rated as more or less familiar

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than those whose literal response was not reflected by their ongoing environment (see 13a,b). Importantly, the number of metaphors rated as most familiar did not distinguish the two sets of items from each other; they included 15 metaphors from the group of 30 which were followed by discoursal resonance (12a,b), and 17 instances from the group of (30) whose literal interpretation was not elaborated on (see (13a,b). Even highly familiar affirmative metaphors, whose literal (and metaphorical) responses are processed directly (see Giora, et al., 1998), involved their default responses, albeit incompatible, in discourse production, regardless of contextual support.

Poetic language thrives on resonating with default yet contextually incompatible interpretations. Consider, for instance, the fragments in (14) below, taken from a speech, delivered in Tel Aviv, by Rela Mazali (2006) during a demonstration against the siege of Gaza, in 2006. The environment of novel *fire* metaphors (in bold) –" Food shortages kill. Denying food is **fire**. … Water shortages kill. Denying water is **fire**") – resonates with their default literal uses, related to gunfire, in both prior and ongoing context. In prior context, *fire* is used literally, referring to military attacks against the Gazans: "Israel's *fire* at Gaza has not ceased. There is no Israeli cease*fire* in Gaza." In the context that follows these novel metaphors, an additional novel metaphor emerges, constructed on the basis of this yet another metaphorical use of *fire*, referring to rage as heat: "Both Gaza and the West Bank will go on **igniting under fire**." Here "igniting under fire" is polysemous. It activates and resonates with the literal gunfire, thereby gets across the metaphorical rage, which is "bullet-less" fire – another novel metaphor:

(14) Rela Mazali (2006)
Let's be clear about this: Israel's *fire* at Gaza has not ceased. There is no Israeli cease*fire* in Gaza.
There is no Israeli cease*fire* even when Israel's soldiers aren't *shooting a single bullet* in Gaza…
There are food shortages in Gaza. Israel is denying
Gaza food….
Food shortages kill. Denying food is **fire**.
There's a shortage of potable water in Gaza….
Water shortages kill. Denying water is **fire**.
Both Gaza and the West Bank will go on **igniting under fire**, till they *kindle* Sderot[13] again too. The **bullet-less fire** that Israel is **shooting** at the dispossessed of Gaza is *fire* that it is also *shooting*, by proxy, at the dispossessed of Sderot.

13. Sderot is an Israeli town next to Gaza.

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As predicted by the Defaultness Hypothesis (see Section 1), various findings, based on natural language use, converge on the view that text production is affected by resonance with default interpretations, irrespective of degree of negation/affirmation, degree of novelty, degree of non/literalness, or degree of contextual fit. (For similar findings with regard to resonance with default yet incompatible literal interpretations in conversations among friends, see Giora & Gur, 2003 and Kotthoff, 2003 with regard to irony, and Giora, 2012 with regard to metaphor).

4. Conclusions

This study reviews the way discourse production unfolds. It tests the Defaultness Hypothesis, predicting that text production will evolve via resonating with default interpretations, regardless of degree of negation, novelty, non/literalness, or contextual fit. To test this prediction, the studies reviewed here focus on resonance in production including novel and familiar figurative language. They show that resonance with default interpretations affects discourse production significantly. This is true even when default responses are contextually incompatible. Resonance, then, is shaped by defaultness, which further shapes our discourse production.

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Producing figurative meanings

The case of idioms

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This paper explores the hypothesis that definiteness marking can be used as a tool for the speaker to trigger idiomaticity. In an experiment, we asked participants to produce the content of newly created figurative expressions. The results showed that the manipulation of a single parameter, definiteness marking, gave rise to a difference in the type of content participants produced for the novel figurative expressions. In particular, figurative expressions that contained a pragmatically unlicensed definite article gave rise to greater idiomaticity than expressions that contained a (licensed) indefinite article. Violating the felicity conditions on the use of a definite article is therefore one way for the speaker to produce figuration.

Keywords: figurative expressions, idiomaticity, definiteness marking, Dutch

1. Introduction

Idiomatic expressions as in (1) constitute a vital part of our language. In (1) we see a phrase that looks like a regular verb phrase (VP) with a verb, 'to kick', and an object, 'the bucket'. Yet, in addition to its literal, compositional meaning, this phrase has a meaning that does not seem to bear any relation to kicking or buckets. We can somehow choose this phrase to express the predicate 'die'.

(1) kick the bucket
Id. (idiomatic) 'die'

It is precisely the ambiguity between a compositionally derived literal meaning and a figurative or idiomatic meaning that makes idioms particularly interesting as an object of study.

A vast literature on idioms has focused on questions regarding the representation of idioms in the lexicon (e.g., Bobrow & Bell, 1973; DiSciullo & Williams, 1987; Everaert, 2010; Jackendoff, 1997; O'Grady, 1998; Swinney & Cutler, 1979). Much evidence reveals that idioms are not stored as big words, but have meaningful

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internal structure (e.g., Abeillé, 1995; Everaert, 2010; Fellbaum, 1993; McGinnis, 2002; Nunberg et al., 1994). Importantly, idioms typically involve figuration, even though the motivation for the particular figure involved might not be clear to the language user (i.e. idioms are not dead metaphors) (Gibbs, 1993; Nunberg et al., 1994).

An important observation is that idioms vary significantly in terms of their properties. Idioms differ for instance in their semantic analyzability or decomposability (e.g., Fellbaum, 1993; Gibbs & Nayak, 1989; Gibbs et al., 1989; Langlotz, 2006; Nunberg et al., 1994). For some idioms, it looks like the idiomatic meaning can be distributed over the individual parts of the idiom, whereas for other idioms, the individual parts do not seem to contribute to the meaning of the idiom as a whole (Gibbs & Nayak, 1989; Gibbs et al., 1989; Langlotz, 2006; Nunberg et al., 1994). The idiom *spill the beans*, for instance, is considered to be semantically decomposable as its meaning *divulge a secret* can be distributed over its component parts: *spill (divulge)* and *the beans (a secret known to the discourse participants)*. The idiom *kick the bucket*, meaning *to die*, is an example of a non-decomposable idiom, as in this case, *die* cannot be distributed over the individual parts of VP *kick the bucket*.

Semantic decomposability does not seem to be a binary distinction, but is a matter of degree (Gibbs et al., 1989). Previous work has demonstrated a correlation between semantic decomposability and syntactic flexibility (e.g. Fellbaum, 1993; Gibbs & Nayak, 1989; Gibbs et al., 1989; Nunberg et al., 1994; see Langlotz, 2006 for a comprehensive overview on this topic). In particular, the more semantically decomposable an idiom is, the more syntactic operations (e.g. topicalization, passivization, etc.) it permits. Corpus data, however, appear to show that idioms are in general more flexible than previously thought, and even non-decomposable idioms display flexibility which cannot be accounted for under a semantic decomposability account (Fellbaum, 2019).

Semantic decomposability in combination with many other factors, such as an idiom's syntactic flexibility, and conventionalization make up an expression's perceived idiomaticity (Wulff, 2010). Idiomaticity is thus a complex notion, with an important, but not exclusive, role for semantic decomposability. According to Wulff (2010), idiomaticity is continuous (and not a discrete category) with highly idiomatic expressions such as *kick the bucket* on one end of the continuum, and completely literal expressions such as *kick a ball* on the other end of the continuum. As such, expressions can be more or less idiomatic, referring to resp. being further away, or closer to, the literal end of the continuum. This paper suggests that one factor that can contribute to the degree of idiomaticity of expressions of the form verb – determiner phrase (V-DP) (e.g. *kick the bucket, make a point*) is definiteness marking on the DP object (cf. Fellbaum, 1993).

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In that sense, this paper identifies definiteness marking as a linguistic tool for the speaker to trigger idiomaticity (cf. Fellbaum, 1993). The main idea, to be specified in more detail in Section 2, is that idiomatic phrases are deviant in the sense that idiomatic phrases violate language users' expectations. Crucially, it is precisely the deviance that signals to the listener that the phrase has an intended figurative meaning. In Grice's (1975) terms, the speaker seems to violate a maxim of conversation, and the speaker thereby guides the listener to an alternative interpretation.[1] The notion of deviance of a phrase is reminiscent of the notion of degrees of grammaticalness (cf. Chomsky, 1964; Chomsky, 1985; Corver, 2015; Katz, 1964; Ziff, 1964). As these authors point out, speakers of a language are perfectly able to understand sentences that are semi-grammatical, where semi-grammatical means that the sentence is syntactically well-formed (i.e. grammatical under some definitions of grammaticality), but deviant in some other way (for instance, semantically, or pragmatically, anomalous). In fact, deviations from grammaticality can have an additional interpretational effect that might not be achievable with a perfectly grammatical sentence. Chomsky (1964), for instance, remarks that:

> There are circumstances in which the use of grammatically deviant sentences is very much in place. Consider e.g., such phrases as Dylan Thomas' "a grief ago", or Veblen's ironic "perform leisure". In such cases, and innumerable others, a striking effect is achieved precisely by means of a departure from a grammatical regularity.". (Chomsky, 1964, p. 384 as cited in Corver (2015))

The additional effect might be a nonliteral use of a particular word in a semi-grammatical sentence. For instance, the word 'green' receives a nonliteral interpretation in the semi-grammatical sentence 'He expressed a green thought' (Ziff (1964, p. 395)). The use of *green* in combination with an abstract noun that cannot have a color (*thought*) is what is considered the deviance here.[2] In this paper, the deviance of idiomatic phrases we investigate is the result of a violation of particular felicity conditions in otherwise morpho-syntactically well-formed sentences. Furthermore, the effect on interpretation is not triggered by a deviant use of *content* words, but rather a deviant use of *functional* elements, namely articles.

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1. That is, it is the unpredictable material that contains the most information (see Giora, 1988).

2. Note that this sentence is morphosyntactically well-formed and, as such, counts as a grammatical sentence. What the authors mean by *semi-grammatical* is that the adjective *green* typically combines with nouns for concrete objects that can have a particular colour. In this case, *green* is combined with the abstract noun *thought*, which means that *green* can only receive a nonliteral (deviant) interpretation.

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In contrast to the idea that idioms are in some sense deviant, the *regularity* of idiomatic expressions is a prevalent topic in the literature on idioms (e.g., Chomsky, 1981; Fellbaum, 1993; McGinnis, 2002; Svenonius, 2005). It is indeed the case that idiomatic expressions are typically (morpho-)syntactically regular. They constitute, more often than not, grammatical structures (even though occasional ungrammatical idioms exist (see Nunberg et al., 1994)). Idioms display regular word order. Similarly, idioms behave regularly at the level of morpho-syntax. Subject-verb agreement occurs as expected on the basis of the rules of the language for instance (Weinreich, 1969). Even idioms that are considered highly non-decomposable, for instance our example in (1), inflect in a regular way instead of as one big unit (compare grammatical (2a) to ungrammatical (2b)).

(2) a. Mary kicked the bucket
b. *Mary kick the bucket-ed

Moreover, idioms do not only inflect in a regular way, the verb inside an idiom also retains its morpho-syntactic properties. For instance, the Dutch idioms in (3) all have an idiomatic meaning 'to die', yet a different auxiliary appears in each of these idioms (Everaert, 1996; Everaert, 2010). The choice of auxiliary depends on properties of the verb inside the idiom ('lay' vs. 'go around'). It crucially does not depend on the idiomatic meaning of the phrase as a whole, as we would expect the auxiliary 'be' in both idioms, as this is the auxiliary the verb 'die' selects in Dutch (see (4)).

(3) a. Hij *heeft* het loodje gelegd.
He has the lead+DIM laid-down[3]
Lit. (literal) 'He put down the piece of lead'
Id. 'He died'

b. Hij *is* het hoekje omgegaan.
He is the corner+DIM around-gone.
Lit. 'He went around the corner'
Id. 'He died'

(4) Hij *is* doodgegaan
He is died
'He has died'

Yet, even though idiomatic expressions seem regular from a (morpho-)syntactic point of view, this paper takes the perspective that there is something *deviant*

3. Throughout the paper, DIM is used to indicate the diminutive, which in Dutch corresponds to *–je*.

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about idiomatic expressions and it is precisely this deviance that triggers the figurative meaning.

There are multiple ways in which expressions can be deviant to trigger figurative meanings and languages might differ in which tools they employ to mark expressions.[4] This paper studies deviance of idioms in Dutch and highlights one type of deviance in particular, but this is crucially not the *only* tool to trigger figurative meanings (and there may be idioms that are not deviant in any way at all). Before going into more detail, I will exemplify several ways in which Dutch idioms seem to be deviant. One type of deviance that can be observed is the use of a definite article instead of a possessive pronoun in idioms that contain body parts such as (5) and (6). In Standard Dutch, body part nouns typically combine with possessive pronouns in literal language. I assume that the definite articles in these idioms can be replaced by a possessive pronoun without a loss of the idiomatic meaning, but the crucial observation is that the dictionary entry for the idioms contains a definite article (e.g. Van Dale (2015)).

(5) het hoofd boven water houden
the head above water hold
Lit. 'to keep your head above the water'
Id. 'to manage difficulties'

(6) het hart op de tong hebben
the heart on the tongue have
Lit. 'to have your heart on your tongue'
Id. 'to tell immediately what is on your mind'

Another example comes from constructions in which an article appears in combination with a name as in (7) with a figurative interpretation (names do not occur with an article in Standard Dutch as they do in German for instance, but it can take articles in something like *de Piet die ik ken* 'the Pete that I know'). Importantly, the deviance does not necessarily reside in a deviant use of an article. We also find idioms as in (8) that contain a color adjective with a diminutive. The diminutive can typically be used to turn mass nouns into count nouns, as in (9), but it is not typically used to turn an adjective into a noun. These expressions are therefore deviant, but not ungrammatical. The deviance is interpretable.

4. As such, it is interesting to see whether L2 speakers pick up on such triggers, depending on their native language. In this respect, MacArthur's results (this volume) are interesting, as L2 speakers have been shown to omit the article in *on one hand* for instance. Whether this is an effect of their L1, or whether this has to do with properties of *on the one hand* remains to be investigated. One argument in favor of the latter explanation could be that L1 speakers seem to omit the definite article in this phrase too (MacArthur, this volume).

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(7) a. een hele Piet zijn
a wole Pete be
Lit. 'to be a whole Pete'
Id. 'to be someone who counts' (Sanders, 2017)

b. de Sjaak zijn[5]
the Sjaak be
Lit. 'to be the Sjaak'
Id. 'to be a loser'

(8) a. een groentje zijn
a green+DIM be
Lit. 'to be a green'
Id. 'to not have any experience in something'

b. een blauwtje lopen
a blue+DIM walk
Lit. 'to run a blue'
Id. 'to be rejected (in love)'

(9) a. Ik wil (*een) bier.
I want (*a) beer.

b. Ik wil *(een) biertje.
I want *(a) beer+DIM.

The goal of this paper is to look more closely into one particular way in which (idiomatic) expressions can be made deviant, namely by producing a pragmatically unlicensed definite article (cf. Fellbaum, 1993). The use of this pragmatically unlicensed definite article is an interpretable deviance from regularity and, most importantly, can be used by the speaker to trigger a figurative interpretation. In particular, we will look at how unlicensed definite articles generate idiomaticity in *new* idioms. This paper will therefore not directly contribute to our understanding of (processing) existing idioms. The approach will instead be to investigate the creation of new idioms and, by doing so, retrospectively gain insight into observed properties of existing idioms. Moreover, the result will teach us whether definiteness is a useful tool to produce new figurative expressions.

2. Definiteness and idiomaticity

There is a clear distinction between definite (10a) vs. indefinite (10b) articles in terms of their semantics. There has been disagreement as to what exactly

5. There are many idiomatic constructions of the form 'to be the NP', many of which do not take a name as the NP.

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differentiates definite from indefinite articles ever since Russell's work (1905) (see Abbott (2006) for an overview). I follow Heim (1982) and take indefinites to introduce a new referent (or file card) to the discourse, whereas the use of a definite article *prevents* the introduction of a new referent and requires the existence of a referent in the discourse (it updates an existing file card). The existence of a referent in discourse, defined as the shared knowledge or common ground between the speaker and hearer, either previously expressed, or not previously expressed, is presupposed (Heim, 1982; Strawson, 1950). As such, uttering (10a) in a context in which we have not yet established a referent for the wombat is decidedly odd (i.e. gives rise to a presupposition failure) and (10b) is the preferred description.

(10) a. Yesterday, Mary saw the wombat.
b. Yesterday, Mary saw a wombat.

There are cases that seem to violate the presupposition introduced by a definite article. In (11) for instance, there was no previous mention of the author, yet a definite article is used. Under Heim's account, these, and other cases are accounted for in terms of accommodation: the hearer can add sufficient information to the discourse to render the use of the definite article felicitous. In particular, in our example the hearer can add the information 'is author of a book about Schubert' for 'the author' (Heim, 1982). This new information needs to be linked to already existing information in the discourse. That is, we will not just add 'is author of a book', but 'is author of a book about Schubert' in which way it is cross-referenced to a referent that has already been introduced.

(11) John read a book about Schubert and wrote to the author.
(Heim, 1982, p. 371)

There are further cases, however, in which the restrictions on the use of a definite article seem to be violated. In cases like (12), we use a definite article with 'train', even though there was no previous mention of a train. Definite NPs like the one in (12) are called Weak Definites (Aguilar-Guevara & Zwarts, 2010; Carlson & Sussman, 2005; Carlson et al. 2006; Klein et al., 2013; Schwarz, 2014; Zwarts, 2014). There is some dispute as to how Weak Definites should be analyzed. One type of analysis that has been pursued is that these definites do not refer to a particular individual referent, but rather to a unique kind, or are kind-referring at the level of events (Aguilar-Guevara & Zwarts, 2010; Schwarz, 2014; Zwarts, 2014). Under this type of analysis, the use of the definite article does not violate any conditions on its use, but is in fact licensed. Irrespective of the particular analysis, the crucial point of examples (11) and (12) is that there are cases in which, at first glance, the felicity conditions on the use of the definite article seem to be violated.

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(12) Mary takes the train to work.

An important observation regarding idioms is that definite articles frequently occur inside idiomatic phrases in both English (see some examples in (13)) (Fellbaum, 1993) and Dutch (see some examples in (14)) (Grégoire, 2009). Moreover, a large number of idioms with definite articles is syntactically frozen and semantically non-decomposable, whereas we do not see frozenness or opaqueness to this extent in idioms with an indefinite article (Fellbaum, 1993). The frequent occurrence of the definite article, and opaqueness of the resulting idiom are reasons to think that the definite article in fact has a function in idioms. Importantly, the use of the definite article is not pragmatically licensed in these idiomatic phrases (cf. Fellbaum, 1993).[6] That is, these descriptions violate Heim's familiarity condition. You can use (13a) in a context without previous mention of a bucket, and (14a) without previous mention of a piece of lead for instance.

(13) a. kick the bucket (e.g. *I heard that Mary kicked the bucket last night.*)
b. break the ice
c. wear the pants
d. spill the beans

(14) a. het loodje leggen
the lead+DIM lay
Lit. 'to lay down the lead'
Id. 'to die'
(e.g. *Ik hoorde dat Marie gisteravond het loodje heeft gelegd. 'I heard that Mary died last night.'*)

b. de kroon spannen
the crown stretch
Lit. 'to stretch the crown'
Id. 'to surpass everything'

c. de broek aan-hebben
the pants on-have
Lit. 'to wear the pants'
Id. 'to be the boss'

d. het varkentje wassen
the pig+DIM wash
Lit. 'to wash the pig'
Id. 'to finish the complicated task successfully'

6. Fellbaum (1993) argues that for some of these idioms, the use of the definite article is licensed, if we look at the noun's figurative meaning. My point is, however, that the definite article is always unlicensed given the noun's literal sense.

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It is important to point out that the idiomatic meaning of the idioms that contain a definite article in their dictionary entry is lost when we replace the definite with an indefinite article, see (15) (Fellbaum, 1993). The idiomatic meaning crucially depends on the presence of the definite article, emphasizing its role in its idiomaticity.

(15) a. Ik zal het varkentje morgen wassen
I will the pig+DIM tomorrow wash
Lit. 'I will wash the pig tomorrow.'
Id. 'I will finish the complicated task successfully tomorrow.'

b. Ik zal morgen een varkentje wassen
I will tomorrow a pig+DIM wash
Lit. 'I will wash a pig tomorrow.'
Id. #'I will finish a complicated task successfully tomorrow.'

In idioms with an indefinite article on the other hand, we can typically replace the indefinite with a definite article without a loss of the idiomatic meaning, like in (16) and (17). We use a definite article when we have previously introduced the (figurative) referent to discourse (the (b) cases) and we use an indefinite article when the (figurative) referent is to be introduced (the (c) cases). In these idioms, therefore, it is not the article that triggers a figurative interpretation (and so article choice is free).

(16) a. een balletje op-gooien
a ball+DIM up-throw
Lit. 'throw-up a ball'
Id. 'introduce an idea'

b. Hij heeft het balletje gister opgegooid
He has the ball+DIM yesterday up-thrown
Lit. 'He threw up the ball yesterday.'
Id. 'He introduced the idea yesterday.'

c. Hij heeft gister een balletje opgegooid
He has yesterday a ball+DIM up-thrown
Lit. 'He threw up a ball yesterday.'
Id. 'He introduced an idea yesterday.'

(17) a. een voorzet geven
an assist give
Lit. 'to give an assist'
Id. 'to provide a lead-in'

b. Hij heeft de voorzet tijdens de vergadering gegeven
He has the assist during the meeting given
Lit. 'He gave the assist during the meeting.'
Id. 'He provided the lead-in during the meeting.'

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c. Hij heeft tijdens de vergadering een voorzet gegeven
He has during the meeting an assist given
Lit. 'He gave an assist during the meeting.'
Id. 'He provided a lead-in during the meeting.'

Could the use of the definite article in idioms be analyzed in the same way as in Weak Definites? Maybe. Weak Definites and idiomatic phrases have certain properties in common. For instance, both idiomatic phrases and Weak Definites display lexical restrictions; i.e. content words often cannot be replaced without loss of the idiomatic/Weak Definite meaning. Furthermore, Weak Definites are less acceptable as antecedents of anaphors (Aguilar-Guevara & Zwarts, 2010), like the definite object of (some) idioms (Bresnan, 1982; Nunberg et al., 1994). There are, however, some differences that make a unified account seem less likely. One difference is that idioms have been shown to be regular in terms of their aspectual properties (Everaert, 2010; McGinnis, 2002), whereas Weak Definites have been argued not to be aspectually regular (Schwarz, 2014). Furthermore, Weak Definites are less lexically restricted than idioms (e.g. 'Jed took/rode/caught the bus' (from Klein et al. (2013, p. 189)) compared to 'Jed spilled/#leaked/#spattered the beans'). Finally, Weak Definites have a transparent meaning in which both the noun and the verb's primary meanings contribute to the whole, whereas the nouns and verbs inside an idiom often do not (Klein et al., 2013). Hence, even though Weak Definites and definite idioms share some properties, they are still distinct (see Klein et al., 2013 for the same conclusion).

If we go back to Example (13a), repeated here in (18a), we can observe that the use of the definite article does not only violate the familiarity condition, but accommodation also fails. The listener cannot add sufficient information to render the use of the definite article felicitous. We cannot cross-reference it to an already existing referent or the utterance situation which is a necessary condition for accommodation: the "mere addition of a card without cross-references, as it would happen with an indefinite instead of the novel definite, is never acceptable in accommodation." (Heim, 1982, p. 374). That is, introduction of a new referent is exactly what the definite article prevents. Given that there is no way to save the use of the definite article in sentence (18a), the sentence should give rise to a presupposition failure, leading to the response '*huh, what bucket?!*'. Yet, (18a) does not give rise to such a response, and instead, the listener assigns the phrase its idiomatic meaning (known for existing idioms such as (18a)).

(18) a. I heard that Mary kicked the bucket last night.

How this works exactly, i.e. how idiomatic meaning assignment happens in existing idioms is, however, not a question this paper contributes to. There is a vast literature on processing idioms and two findings stand out (for a more detailed overview of the literature I refer the reader to Langlotz 2006): There is much

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evidence that idioms are processed fast (as fast as, or faster than, matched literal phrases) (e.g., Gibbs, 1980; McGlone et al., 1994; Ortony et al., 1978; Swinney & Cutler, 1979; Tabossi et al., 2009), and there is evidence that listeners do not resort to a completely different way of processing when they encounter idioms (e.g., Cutting & Bock, 1997; Konopka & Bock, 2009), and literal processing continues when processing an idiomatic string (e.g., Holsinger, 2013; Peterson et al., 2001; Titone & Connine, 1999). These observations are accounted for in processing models in which both the literal and figurative interpretation of idioms are processed, such as the configuration hypothesis (Cacciari & Tabossi, 1988) and hybrid models (Titone & Connine, 1999, and Sprenger et al., 2006 for a hybrid production model). Given this, we could, as Fellbaum (1993) does, hypothesize that the definite article in existing idioms functions in its regular way to prevent the introduction of a new referent, and take unlicensed definite articles to function as the *idiom key* as defined in Cacciari and Tabossi. The idiom key is the point at which listeners recognize the phrase as an idiom. Up till this point, only the phrase's literal meaning is computed, but processing of the literal meaning is suppressed once the phrase is recognized as an idiom, and the stored idiomatic meaning can be retrieved. Such a hypothesis would be in line with the observation that listeners do not resort to a different processing mode, and the phrase's component parts can individually contribute to processing.

This paper, however, will not answer questions regarding the processing of existing idioms, but rather takes the perspective of investigating factors that contribute to idiomaticity in *new* idioms. Crucially, for new idioms, there is no existing idiomatic meaning representation available in the lexicon, and so the listener's only choice is to process the sentence in its literal compositional manner at least at the start. That is, there is no point at which the idiom can be recognized as an existing idiom. Yet the hypothesis is that there is a point at which the listener detects a certain deviance, which triggers the assignment of a (new) figurative interpretation instead of a literal interpretation. In our case, this deviance is a pragmatically unlicensed definite article.

The rationale here is that identifying factors that trigger the assignment of a more or less idiomatic interpretation will also enhance our understanding of existing idioms by retrospectively being able to account for (some of) their properties. Importantly, by creating new idioms we generate data that is no longer available for existing idioms. In addition, matters such as idiom familiarity, which are known to have an effect on idiom processing for instance (Cronk & Schweigert, 1992; Cronk et al., 1993; Tabossi et al., 2009), are bypassed when looking at new idioms.

What is the suggested role for unlicensed definite articles in new idiomatic expressions exactly? The definite article is suggested to function in its regular way in that it prevents the introduction of a new referent to discourse (the definite NP obligatorily scrambles out of the domain of existential closure (cf. Diesing & Jelinek, 1995)). Instead of introducing a new referent, the definite article requires the search

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for an existing referent (or file card), yet this search does not return any result. Moreover, the speaker quite obviously violates the presupposition of existence, and so adopting normal assumptions that the speaker is cooperative *and* must know she so blatantly violated the presupposition of existence, the hearer is guided to a figurative interpretation (Fellbaum, 1993, see also Grice 1975 on irony and metaphor).

The hypothesis regarding the role of definiteness in new idioms is as follows:

Hypothesis:
The definite article in (new) idiomatic phrases triggers a figurative meaning by:
a. Preventing the hearer from introducing a new referent to discourse;
b. Triggering a relevant figurative interpretation for the VP as a whole.

Let me explain this further by using the newly created idiom, "clean the table", which will later be used in the experiment (in Dutch), as an example. Suppose Speaker A is upset with Speaker B, and Speaker B would like to come to terms again. Suppose Speaker A tells Speaker B to first "*clean the table*", which is presented as a necessary condition to make peace again. In this mini discourse, there is no previous mention of a table (and let's assume neither is there a unique table in the actual environment of speakers A and B). The definite article linked to *table* functions in its regular way to prevent the introduction of a new (table) referent to discourse. Now assuming that the speaker is cooperative, yet evidently, violated the presupposition of existence, Speaker B takes this as a cue that a figurative interpretation for *clean the table* is intended. Instead of finding a familiar or unique *table* referent, the instruction is to find a unique or familiar event the VP refers to as a whole (the instruction being "find a unique/familiar *table-cleaning* event"), and one that is relevant to the ongoing discourse. This goal can be achieved in different ways. Either by finding a unique, figurative, object (clean a contextually-defined figurative object), or by mapping the entire VP onto a different unique event (e.g. start over). The definite article does not provide any instructions about which is the preferred option. Crucially, the hearer is not bound to the properties of the component parts of the original VP in assigning a figurative event referent to the VP, which can lead to idioms that preserve very little of the original, literal, VP's properties. This way then, we can create highly idiomatic, or semantically non-decomposable, idioms, as the definite article stops you from introducing a concrete referent to discourse.[7] In the following section we will put this hypothesis to the test and have participants produce figurative meanings for new idioms. The

7. The fact that the presupposition is so obviously false (to both speaker and hearer) might be a reason that a failed presupposition with definite articles can trigger a figurative meaning. Interestingly though, other presupposition triggers like 'stop' or 'both' do not seem to have this effect (Irene Heim, p.c.).

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crucial manipulation is the definiteness of the article where the prediction is that unlicensed definite articles in new idioms will lead to greater idiomaticity.

3. Producing figurative meanings

This section presents an experiment which tests whether we can indeed trigger figurative meanings with a pragmatically unlicensed definite article in newly created idiomatic expressions. In particular, in the experiment, participants are asked to produce a meaning for a newly created idiomatic expression that either contains an object introduced by a definite article or an object introduced by an indefinite article (see examples in (19) and (20), translated from Dutch). The use of the definite article in these examples is infelicitous, as there is no existing referent available for the mentioned object. The question is whether expressions that include a definite description, and thus violate the familiarity condition, will induce greater idiomaticity than do the same expressions with an indefinite description.

As discussed in the previous section, the definite article prevents the hearer from introducing a referent to discourse and triggers a figurative meaning for the VP as a whole. As such, the provided meaning is not required to retain anything of the original VP's properties. The examples of made-up idiomatic expressions in (19) (their Dutch counterparts were used in the experiment) can therefore trigger a more idiomatic interpretation that preserves less of the idiom's literal meaning than their indefinite counterparts in (20).

(19) a. offer the strawberry
b. clean the table
c. use the knife
d. crush the elephant
e. throw-away the ticket

An indefinite article does not have the same effect as a definite article. It does not prevent you from introducing a referent to discourse. But the question then is what types of meanings participants will provide for newly created idiomatic expressions with an indefinite article. In the experiment these phrases are introduced as new idioms and, moreover, the phrase's literal meaning is incongruous in the context of the stories in which they are presented, so we do expect participants to provide figurative meanings. Yet we expect participants to generate different types of meanings for expressions with an indefinite article than with a definite article. That is, the definite article is predicted to have an effect on the expression's idiomaticity *on top of* the idiomaticity caused by the mismatch between the phrase and the context provided.

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(20) a. offer a strawberry
b. clean a table
c. use a knife
d. crush an elephant
e. throw-away a ticket

Crucially, we expect that an expression with an indefinite article more easily allows for a meaning that preserves (much of) the literal (meaning of the) VP. An indefinite article instructs the hearer to introduce a new referent to discourse. As such, the prediction is that the meanings participants provide can retain more of the properties of the VP the expression is based on, and will thus be less idiomatic.

3.1 Participants

Forty native adult speakers of Dutch participated in this study (age range: 18 – 49 years, 10 male). Participants were recruited from the participant database of the Utrecht Linguistics Institute. They had no known reading disability and had normal or corrected to normal vision. The participants were paid for their participation.

3.2 Materials and design

The participants read stories that introduced a new, non-existing, (created by the experimenter) idiomatic phrase at the end of the story (e.g. *de tafel schoonmaken* 'clean the table'). Half of the participants would read the non-existing idiom with a definite article as in the example, whereas the other half of the participants would receive this idiom with an indefinite article (e.g. *een tafel schoonmaken* 'clean a table') where the context was kept the same. That is, the only difference between these idioms is the choice of the article. The participants' task was to provide a meaning for this non-existing idiom.

Twenty non-existing idioms were created (see examples in (21) and (22)) using the following constraints: (1) they should not exist as idioms in Dutch, (2) they should use a verb that takes only one object argument, and (3) they should contain a count noun that did not encode unique entities (like *the moon*). The new idioms were combined in the experiment with twenty existing verb object idioms (e.g. *de boot afhouden* lit. 'to keep off the boat', id. 'to ward off something (undesirable)'). This amounts to a total of forty stories that each included a VP (V - DP) idiom. An example story and its English translation are given in (i). Out of the twenty existing idiomatic phrases, half contained a definite article and half contained an indefinite article (the articles they contain in their standard form). For the non-existing idioms, the crucial manipulation was the definiteness of the

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article; the remainder of the idiomatic phrase and the story were identical across conditions to enable an optimal comparison.

> (i) *Frank studeerde sinds een paar maanden rechten en het viel hem niet mee. Hij had zich er iets heel ander bij voorgesteld. Hij moest saaie wetboeken doorpluizen en eindeloos fictieve casussen doornemen. Toen hij weer eens voor een opdracht op internet aan het surfen was, kwam hij tot zijn verbazing een stuk tegen dat precies paste bij de opdracht die hij gekregen had. Voor hij het wist had hij het stuk gekopieerd en als opdracht geüpload op de cursuswebsite. Tot zijn grote schrik echter, was de cursuswebsite erg goed in het detecteren van plagiaat en het duurde dan ook niet lang voordat hij een mailtje kreeg waarin stond dat hij zich bij de docent en decaan diende te melden. Frank schaamde zich en dacht dat dit het einde zou betekenen van zijn carrière als student. Gelukkig voor hem schorste de decaan hem niet gelijk. Frank werd geacht de tafel schoon te maken waarna hij zijn studie wellicht zou mogen afronden.*
>
> *English translation:*
>
> 'Frank has been a college student of law for several months now and he thinks the whole endeavor is pretty tough. […] When he was browsing the internet for information on an assignment, he came across a piece of work that exactly fit the assignment he was supposed to hand in. […] He uploaded the assignment as being his own assignment to the course website. The course website however, was very good at detecting plagiarism and he thus soon received an email indicating that he needed to come see the dean. […] Lucky for him, he wasn't expelled right away. Frank was ordered to clean the table, after which he might be able to continue his studies.'

After reading the story, the participants received the following questions (in this order):[8]

a. Do you know this idiom?
b. What does *de tafel schoonmaken* 'to clean the table' mean?
c. How transparent do you think this meaning is?

Question (a) was a yes/no question. Question (b) required an open text answer (participants were free to fill in an answer of any length). Question (c) was judged by participants using a 7-point Likert scale.

The forty test items were pseudo-randomly divided over two lists (counterbalanced) and every list contained ten items per condition. That is, ten existing

8. In fact, participants received more questions than this, but the results are not relevant to the hypothesis reported in this paper.

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definite idioms; ten existing indefinite idioms (the twenty existing idioms were the same for all participants); ten non-existing definite idioms and ten non-existing indefinite idioms.

3.3 Procedure

Participants were tested in a sound proof booth. The questionnaire was created using LimeSurvey, a free software application that allows you to create online questionnaires. Participants received explicit instructions, both written and spoken, as to what the terms 'idiom' and 'idiomatic' mean by using examples. In addition, they were instructed that the transparency scale was used to indicate how much of the literal meaning contributed to the idiomatic meaning, again using examples. Although the time participants needed for the experiment varied, most participants completed the experiment in about forty-five minutes.

3.4 Results

3.4.1 *Types of meanings for non-existing idioms*

Participants' open answers to the question what the new idiom means were coded by one coder, the experimenter, who was blind to condition. Answers which were the same, or very similar, were first grouped together, as many participants gave the same (type of) answer (i.e. all answers *help* were grouped together and all answers *offer help* were grouped together for instance). These groups of answers were then assigned to either one of three points on the idiomaticity continuum relative to each other. Answers that were most abstract, in which hardly anything (if anything) of the VP it was based on was preserved (typically not even a V-DP structure), were classified as category (1) – which consisted mostly of non-decomposable meanings (e.g. *to help, to come down hard, to go all out, to start anew, to be disappointed*). Answers that could be composed of a verb and an (figurative) object were classified as category (2) (e.g. *to offer help, to take precautions, to solve a problem, to offer apologies, to receive no thanks*). Category (3) contained the most concrete answers that preserved most of the idiom's literal meaning and were typically concrete tasks to be performed (like the literal meaning of the idiom) (e.g. *to do something (for someone), to use violence, to hide something, to carry out a task, to receive something valuable*). A fourth category was included that contained the "leftover" answers that did not fit into one of the three categories. One experimental item (*bombard a/the wall*) had to be excluded from analysis, as the answers did not fall out in different groups (participants provided a broad range of (varied) meanings).

The categories, excluding the leftover category, then formed a scale from most literal (category (3)), to most idiomatic (category (1)). In particular, category (3) included to some extent literal translations of the phrase, as concrete actions that needed to be performed (and often included the verb used in the idiomatic phrase)

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(e.g. *clean a/the table – carry out a (replacement) task; offer a/the flower – offer a gift*). Category (2) still mostly preserved the V-DP structure, but with a non-concrete object (e.g. *offer a/the flower – offer help; crush an/the elephant – solve a problem*). Finally, the most idiomatic category, category (1), did often not even preserve the V-DP structure (e.g. *offer a/the flower – help; clean a/the table – start anew*).

The leftover category typically included even more idiomatic answers (further away from the literal meaning) than the other three categories. For instance, *clean the table* was translated as 'clear your name' and *offer the chocolate* as 'get married'. The leftover category was not included in the analysis, as it contained answers of different types and, as such, could not easily be placed on the scale. It is, however, important to note that more answers to definite (121) than indefinite (86) idioms fell in the leftover category.

The number of answers per category for definite vs. indefinite idioms is plotted in Figure 1. A visual inspection of the data in Figure 1 shows that the distribution of answers is different for definite vs. indefinite non-existing idiomatic expressions. Most given answers (for both definite and indefinite idioms) were of category (2). But notably, for indefinites, category (3) (least idiomatic) contained more answers than category (1), whereas for definites category (1) (most idiomatic) contained more answers than category (3), which contained relatively few answers.

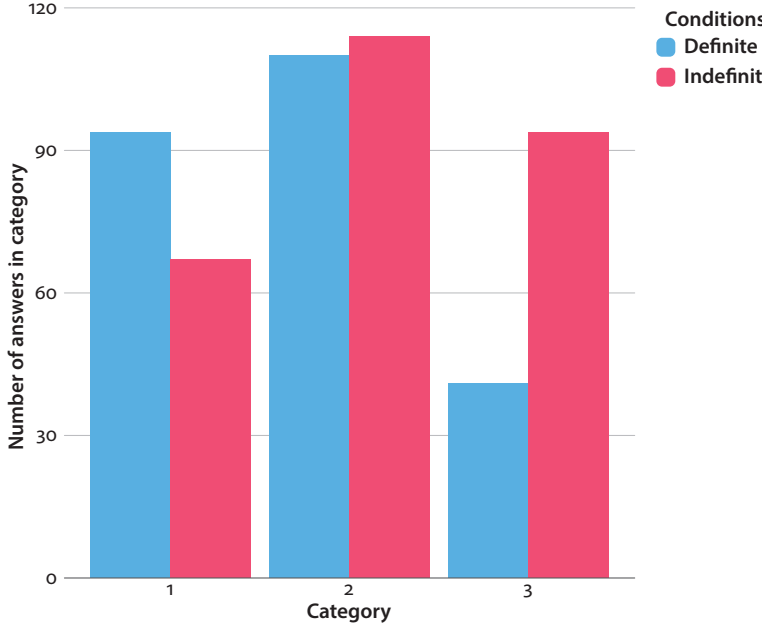


Figure 1. The number of answers per category for Definite (blue) and Indefinite (red) non-existing idioms

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An ordinal regression analysis with ANSWER CATEGORY as the dependent variable and DEFINITENESS as fixed effect and ITEM and PARTICIPANT random effects supports our visual inspection and displayed a significant effect of definiteness on answer category (b = 0.87 (0.17), $p < .0001$). In particular, for a one unit change in definiteness of the idiom, from definite to indefinite, we expect an increase of 2.4 in the expected value of the answer category. It seems then, that participants indeed assigned different types of meanings depending on whether the article used was definite or indefinite. Specifically, expressions with a definite article generated more idiomaticity than expressions with an indefinite article.

3.4.2 *Transparency rating*

In addition to providing a meaning for non-existing idiomatic expressions, participants also judged the transparency of both existing and non-existing idioms on a 7-point Likert scale. The question as to how transparent the participant thought the meaning of the idiom was followed the question what they think the idiom means. That is, the question asked about how transparent they thought the meaning they had just assigned to the idiom was. Transparency was defined as a measure of how close to the literal meaning of the phrase the assigned, idiomatic meaning is. Our prediction was that indefinite idioms would be rated as more transparent than definite idioms, as definite idioms do not require the produced meaning to retain the original VP's properties. In fact, the definite article prevents the introduction of a new referent to discourse. An indefinite idiom, in contrast, more easily allows the participant to retain the properties of the original VP, as there is an instruction (the indefinite article) to introduce a new referent to discourse.

In addition to definiteness, familiarity with the idiom (how well the participant knows the idiomatic meaning) might also play a role in perceived transparency. As such, we did not look at existing vs. non-existing idioms, but we looked at idioms that were known by the participant vs. idioms that were not known by the participant. It turned out that not all participants knew all of the existing idioms. Out of the existing idioms, 16.5% was judged to be unknown. Interestingly, 3% of the non-existing idioms were judged as 'known' by participants. Figure 2 visualizes the data and shows that participants' transparency rating was generally very low (participants used a 7-point scale for their judgment).

A multi-level model was run with TRANSPARENCY as the dependent variable, DEFINITENESS, KNOWN, and their interaction as fixed effects and ITEM and PARTICIPANT as random effects. A model that included an interaction effect was not significantly better than a main effects model ($\chi^2(1) = 2.44$, $p = .12$) (as a result of the absence of a significant interaction effect). The main effects model displayed a significant effect of KNOWN such that participants judged idioms that they know

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as being more transparent than unknown idioms (b = −0.63 (0.13), p < .0001). There was however, no effect of DEFINITENESS (b = −0.0009 (0.09), n.s.).

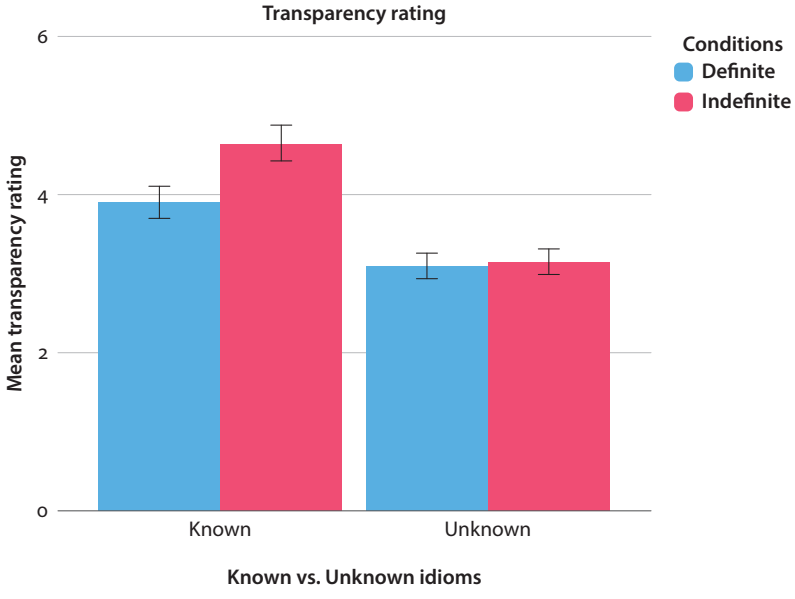


Figure 2. Mean Transparency rating for definite vs. indefinite idioms depending on whether or not participants know the idiom

The difference in types of meanings assigned to non-existing definite vs. indefinite idioms was thus not reflected in participants' judgment of the transparency of the idiom. In fact, transparency ratings overall were very low for unknown idioms (under 3.5 on a 7-point scale); significantly lower than for known idioms. Familiarity thus plays an important role in perceived transparency.

If we plot the transparency rating per answer category as defined in the previous section (see Figure 3), it looks like category (3) answers (least idiomatic) are rated as more transparent than category (1) (most idiomatic) and (2) answers. If we run a multi-level logistic regression, we find that category (3) (mean = 3.56) is indeed rated as significantly more transparent than category (1) (b = 0.43 (0.17), p < .01) and marginally significantly more transparent than category (2) (b = 0.26 (0.15), p = .09), whereas categories (1) (mean = 2.98) and (2) (mean = 2.96) do not differ from each other in their transparency rating (b = 0.17 (0.15), p = .26).

The categorization of answers in terms of idiomaticity, then, seems to be on the right track, but we were not able to detect an overall effect of definiteness on transparency ratings in new idioms, as this effect is minimized by the effect of familiarity, resulting in a floor-effect of transparency for the new (unfamiliar) idioms.

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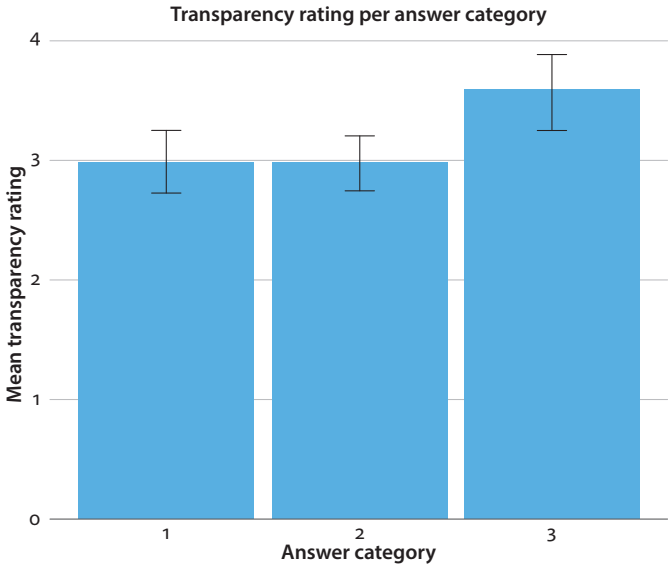


Figure 3. Mean Transparency rating for newly created idioms depending on what type of meaning participants assigned to the idiom (categories (1), (2), (3))

3.4.3 *Discussion of experimental findings*

This experiment set out to trigger figurative meanings with an unlicensed definite article in made-up VP idioms. The results suggest that participants indeed assigned more idiomatic meanings to expressions in which a pragmatically unlicensed definite article was used. This follows from the types of meanings participants provided for new definite expressions as compared to new indefinite expressions. Definite expressions led to greater idiomaticity than indefinite expressions. The definite article then, seemed to function in its usual way in preventing the listener from introducing a referent to discourse. This effect of definiteness is an additional effect in the context of the present experiment. Indefinite expressions gave rise to figurative meanings as well, as there was a mismatch between the phrase and the given context. The definiteness effect is therefore in addition to the effect of an incongruency between phrase and context, or the relevance of the phrase to discourse (cf. Giora 1988, Grice 1975).

This is the first experiment of its kind, and the results show that definiteness indeed has an effect on the resulting meaning. We should, however, interpret the results with caution, as the effect was found by analyzing participants' open answers to the question what the new idiom means, and not in their (quantitative) transparency ratings. Coding the open answers was not a trivial task as there

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were no constraints on participants' open answers. The chosen route was to first group all answers of the same type together (as many participants gave the same, or very similar, answers), and to then assign those groups to one of three points on the idiomaticity continuum relative to each other. This seemed to be the most objective classification of answers, but there were two problems that followed from the absence of any restrictions on the types of answers participants provided: (1) it led to the exclusion of many answers that were now categorized in the "leftover" category, as they were different from the majority of answers, and (2) the groups of answers could represent different points on the idiomaticity continuum, as assignment to a particular category for a new idiom was relative to the other groups of answers (rather than an absolute categorization). A stronger point could be made in a future experiment if we could find a quantitative measure of idiomaticity. One could consider setting up a similar type of experiment, but having participants make a forced choice between different, pre-defined, answer categories, where the answer categories are created based on some measure of idiomaticity.

Other factors that trigger idiomaticity should also be explored in further research. New idioms for the experiment were created using several constraints, namely (1) they should not exist as idioms in Dutch, (2) they should use a verb that takes only one object argument, and (3) they should contain a count noun that did not encode unique entities (e.g. *the moon*). There were no constraints on verb type (other than using verbs that take objects). Verb type, and verb-object combinations, however, did seem to have an effect on idiomaticity of the VP. That is, definiteness is one trigger for idiomaticity, but many more factors than definiteness play a role (see also Wulff, 2010). Future experiments should explore these factors in more depth and how they trigger idiomaticity. Possible avenues to look into in more detail are the peculiarity of the verb-object combination (cf. Wulff, 2010), and the relevance of the V-DP idiom to the discourse (cf. Giora 1988, Grice 1975).

4. General discussion and future directions

This paper explored the hypothesis that definiteness marking can be used by the speaker as a linguistic tool to trigger idiomaticity. In particular, the hypothesis was that a sentence that is (linguistically) deviant triggers idiomaticity. One way to create a deviant string is by using a definite article when it is not pragmatically licensed. Importantly, the definite article was hypothesized to function in its usual way in these expressions in the sense that the definite article prevents the introduction of a discourse referent.

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The results of the experiment showed that, indeed, definite novel idioms produced meanings that preserved very little of (the meaning of) the VP it was based on. That is, very few meanings that participants produced fell into category (3), the answer category in which the meaning of the literal VP was best reflected, and the answer category that was judged as most transparent relative to the other answer categories. This shows then that even the smallest functional elements in a phrase can affect a phrase's idiomaticity, at least when creating new figurative expressions.

One aspect of this work that requires further exploration, however, is the notion of idiomaticity. Idiomaticity is a complex notion and the extent to which an expression is perceived as idiomatic depends on many factors. One of these factors is semantic decomposability (Wulff, 2010). In the experiment idiomaticity was captured by looking at the meaning assigned to the new idioms, and mostly in terms of semantic decomposability, but there are two problems with this. The first one is that its semantics, or an expression's semantic decomposability, is not the sole contributing factor to an expression's idiomaticity. The second is that semantic decomposability seems to be more of an intuitive notion than something that can be backed up with evidence. In particular, it does not seem to be linked to the presence or absence of a potential referent in the literal counterpart (Fellbaum, 1993). For instance, the idiomatic sense of (21) can be, and is by different speakers, expressed with and without an object.

(21) de boot missen
the boat miss
Lit. 'to miss the boat'
Id. 'to be late' (translated from woorden.org 2016)
Id. 'to miss a good opportunity' (translated from spreekwoorden.nl n.d.)

Similarly, the idiomatic sense of *kick the bucket*, which is typically seen as non-decomposable, could in principle be expressed with *lose your life*, or *cease all biological activity* which both have the same structural properties as the VP *kick the bucket* (Fellbaum, 1993).[9] Decomposability, then, does not so much seem to be a property of the idiom per se. To put it more strongly, there does not seem to be a principled way to distinguish semantically decomposable from non-decomposable idioms (Everaert, 2010). Furthermore, there is psycholinguistic work showing there is little evidence that decomposability plays a role in processing, and that previous effects of decomposability have failed to replicate (Tabossi et al., 2008).

Potentially then, trying to capture the effect of definiteness on an expression's idiomaticity in terms of its semantics, or semantic decomposability, is not the right way to proceed. One way to avoid the problems associated with semantic

9. I am grateful to Irene Heim for providing the example *lose your life*.

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decomposability would be to find a different measure of idiomaticity of new (idiomatic) expressions that does not rely on its semantics. Instead of asking participants to provide a meaning for the idiom, we could simply present V-DP phrases without context and instruct participants that some of these phrases are idioms in some alien language. We could then ask participants to indicate which of the phrases they think are likely to serve as idioms in that language (see Fellbaum (1993) for a similar suggestion). The prediction here is that V-DP phrases with a definite article will be judged as more likely to serve as an idiom than V-DP phrases with an indefinite article. The new idioms could be presented without context in this type of experiment. This has the additional advantage that the effect we find is not an effect of definiteness *on top of* incongruency with the context, but an effect of definiteness by itself.

In our experiment we had participants assign meanings to newly created idiomatic expressions. So far, we hypothesized that a listener is cued to assign a more idiomatic meaning when she encounters a deviance in the form of an unsatisfied felicity condition. But of course, it all starts with the speaker producing this unlicensed definite article. The question arises as to whether we can also make participants use definite vs. indefinite articles to express more vs. less idiomatic meanings.

We could experimentally test this in a similar type of experiment. Instead of providing an idiom and asking the participants to give us the meaning for this idiom, we would provide participants with meanings and ask them to provide an idiomatic expression that best describes this meaning. To be able to make the strongest claim, we could present meanings expressed with a verb only (and no object, e.g. *die*), yet ask participants to create the new idiom with a set of two content words, a verb and a noun (e.g. *drop, apple*). The crucial manipulation is to *only* offer content words, not function words. In order to formulate a grammatical phrase, then, participants will have to choose suitable functional elements. The prediction is that participants will choose definite articles for their new idioms more often than indefinite articles. An experiment as proposed here would test the prediction that language producers can make use of definiteness marking as a tool to produce highly idiomatic expressions.

The present paper looked at new idioms and asked the question whether definiteness of the article has an effect on idiomaticity of the expression. The paper argued that the definite article functions in the same way it does in literal language, and the failed presupposition of existence serves as a cue to assign a figurative interpretation (to those new idiomatic expressions). Whether (part of) this process takes place when processing existing idioms is unclear. I mentioned at an earlier point that the presupposition failure might be interpreted as the idiom key as defined in Cacciari and Tabossi (as Fellbaum, 1993 suggests). The question whether this is indeed the case, I leave for future research.

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Even though there is still much to be understood about the effect of definiteness in idioms, we did find that definite expressions produced greater idiomaticity than indefinite expressions. This result regarding the creation of new idiomatic expressions helps us understand two observations about definite articles in existing idioms better, namely their frequent occurrence, and the resulting semantic opaqueness of the idioms. The definite article (once) served as the crucial tool for the speaker to produce figuration in the first place. It also illustrates that current speakers might be able to use definiteness to produce new figurative expressions.

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The production of verbal irony

How to be an ironist

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Although verbal irony has been a topic of interest for researchers studying language comprehension, the production of irony is also of great interest, since it highlights the situational, pragmatic, and even cultural factors that affect language use. Issues of production and interpretation have, if anything, become even more salient with the rise of email, texting, and social media. Even though such mediums are conversationally impoverished, new conventions and nonliteral markers have evolved to allow verbal irony to both survive and flourish online. This chapter will provide a review and an assessment of the current state of the literature on these topics.

Keywords: irony, discourse, pragmatics, computer-mediated communication, sentiment analysis

1. Definitional issues

Researchers who study nonliteral language production have to grapple with the thorny issues of what nonliteral language is, and how many types there might be. If we define nonliteral language broadly, as in saying one thing but meaning something else (Katz, Blasko, & Kazmerski, 2004), then there could be a large number of such figurative forms. Modern-day researchers are also the heirs of centuries of scholarship by students of rhetoric and literary criticism, who identified dozens of nonliteral figures and tropes (e.g., Preminger & Brogan, 1993). However, many of these are principally employed in poetry and verse. A handful of nonliteral forms, however, are used quite commonly, and have become the objects of study by psychologists and linguists (Kreuz & Roberts, 1993).

Along with metaphor, irony has been a primary focus of empirical research in psychology and related disciplines. But even if we limit the discussion to irony, there are still both definitional and typological issues to be resolved. Irony itself is a label that has been applied to a wide array of linguistic and nonlinguistic phenom-

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ena (Knox, 1973; Kreuz, 2020). These include a pretension of ignorance (Socratic irony), tension experienced by audience members of a play (dramatic irony), and the odd juxtaposition of events referred to as situational irony (e.g., the police station that is burglarized; Lucariello, 1994). Researchers, however, have principally focused on verbal irony, which has been defined as communicating "the opposite of what was literally said" (Wilson & Sperber, 1992, p. 53). Even this definition may be problematic, and it leaves us with another question: is sarcasm the same thing as irony?

If we ask research participants to define these two terms, a number of distinguishing characteristics can be identified. Compared to irony, sarcasm is described as intentional counterfactual speech, often intended to hurt someone, whereas irony principally involves the unexpected (Kreuz & Glucksberg, 1989). In addition, although it is often seen as negative, sarcasm is perceived as having a humorous aspect, and sometimes involves the use of a certain tone of voice (Dress et al., 2008). It's also the case that people's use of these two terms may be shifting: the linguist Geoffrey Nunberg has argued that, by the turn of the millennium, the term "sarcasm" was being used in place of what had traditionally been the province of the term "irony" (Nunberg, 2001). On the other hand, a recent analysis of the use of these terms in online forums in the United Kingdom and Italy found important differences with regard to evaluation and communication strategies (Taylor, 2017). And people who describe themselves as sarcastic, which has become common on online dating sites, seem to explicitly equate being sarcastic with being funny or witty (e.g., Lawson & Leck, 2006).

Depending on their theoretical orientation, researchers of verbal irony vary considerably in what they label as ironic language. One reason for these diverse and sometimes conflicting taxonomies is that irony frequently involves the use of other forms of nonliteral language, such as exaggeration. These various types can be considered and described separately (e.g., Roberts & Kreuz, 1994), or they can be subsumed under a general heading of irony. Ray Gibbs, in an analysis of the conversations of college-aged friends, defined irony very broadly, and included jocularity, sarcasm, rhetorical questions, hyperbole, and understatement (Gibbs, 2000). Herbert Colston includes ironic analogy and ironic restatement (Colston, 2017). And still others have proposed breaking sarcasm itself into a number of subclasses, such as 'like'-prefixed sarcasm, which contradicts the literal meaning of the rest of an utterance (Camp, 2012). For the purposes of this review, sarcasm, a way of speaking that can involve aggression and humor, will be characterized as a subtype of a larger class of verbal irony, in which people express intentions that are often the opposite of the literal meanings of their words. This is an oversimplification, and is likely to please no one, but it is good enough for present purposes, and will prevent this review from being stranded on the reefs and shoals of definitional issues.

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Finally, it must be noted at the outset that there exists no agreed-upon theory of irony or sarcasm comprehension. Many proposals have been made, and they tend to highlight one nonliteral aspect or another, such as typicality (or "defaultedness;" Giora et al. 2015). The various proposals have been summarized by Garmendia (2018). One attractive candidate, a parallel constraint satisfaction model, takes into account speaker, lexical, and pragmatic cues, which are evaluated simultaneously. The parallel activation of these cues eventually causes the system to settle into a solution that favors either a literal or a nonliteral interpretation (Pexman, 2008). As we will see, the irony production literature is even less well developed theoretically, since researchers are still trying to identify the most important factors that ironists might employ. As a result, we will not advocate for a particular theoretical approach, as this seems premature. However, a review of the relevant linguistic and paralinguistic factors that have been identified is possible, and these elements will be described in the following sections.

2. Cues and constraints

2.1 Knowledge constraints

Before making a nonliteral statement, a potential ironist needs to decide whether her audience will be able to see through her linguistic ruse in order to recover what she actually intends. A number of factors might play a role in this calculation, and they can be subsumed under the general heading of *inferability* (Kreuz, 1996; Kreuz, 2000). If the potential ironist believes that inferability is high, then she may conclude she has license to express herself nonliterally. If inferability is perceived to be low, however, employing verbal irony is riskier, and may result in confusion and misunderstanding. As originally proposed, this principle of inferability was conceptualized as a linguistic heuristic, along the lines of Tversky and Kahneman's (1974) use of the term: a simple mental shortcut that provides a good chance for success, but one that is fallible and subject to systematic bias. One could, for example, imagine a highly egocentric person who consistently confuses her conversational partners by assuming that they can interpret her nonliteral assertions correctly. In general, however, people seem to be fairly good at this calculation, which suggests that they have a good intuitive sense of what constitutes inferability.

What might these factors include? The most important may be the amount of *common ground* that exists between conversational participants. Although this term has a colloquial meaning of shared opinions or interests (e.g., "We share common ground with our international trading partners"), in discourse psychology it has a more specific meaning. Herb Clark has defined it as common or mutual

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knowledge, beliefs, and suppositions (Clark, 1985). For example, it's not enough for a listener to know that a speaker is an only child: the speaker must know that the listener knows that the speaker is an only child. Only in this case can a fact, attitude, or belief be said to exist within the parties' shared common ground.

Common ground can be established in a variety of ways, as described by Clark (1996). The simplest of these is *physical copresence*. If conversational partners inhabit the same physical space (as opposed to talking on the phone or interacting via electronic means), they have license to make reference to this environment, secure in the belief that such knowledge is shared. Comments about the weather, whether literal or ironic, will be transparent, since both parties are experiencing the same physical world. As a result, utterances like "What lovely weather!", if spoken during a downpour, should be nonproblematic since inferability will be high.

Community membership is another example of shared common ground. If both parties in a conversation are plumbers, for example (and if both parties know that both parties know this), then occupational knowledge will regulate their speech in a variety of ways. References to particular tools or repair procedures will not require extensive explanation, and referring to a particular repair as "an easy fix" should be readily understood as literal or ironic. We simultaneously inhabit a multitude of social roles, all of which can provide the basis for exploiting community membership within a given conversation. Clark (1996) provides many examples, such as shared residence, religion, ethnicity, and gender. Any of these can be exploited by potential ironists as long as both parties recognize this shared membership.

A correlational study of community membership suggests an association with verbal irony use. We asked subjects to make judgments about how close they felt to a variety of other types of people, such as relatives of various degrees, friends, associates, and strangers. ("Closeness" served as a proxy for common ground, since this term was readily understood by the subjects.) A second group of participants was given the same list of people as in the first study and asked how likely they would be to employ sarcasm with each one. A positive association was found and about 40% of the variance was accounted for (Kreuz 1996). As predicted, people reported feeling closer to their own friends than to their parents' friends or to store clerks, but they also said they were more likely to use sarcasm with them. However, such a study does not allow a causal inference to be made: the closeness may lead to the use of sarcasm, or the use of sarcasm may lead to a perception of closeness. A later study by Kreuz, Kassler, Coppenrath, and McLain Allen (1999) manipulated common ground experimentally. Participants read and evaluated scenarios in which characters were identified as intimates (e.g., husband and wife) or as strangers (e.g., attendees at a fund-raiser). In a series of experiments, research participants rated potentially nonliteral statements, such as "You sure were the hit of

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the party!" as equally ironic, regardless of the relationship status of the characters. However, the ironic statements' appropriateness varied significantly: these nonliteral statements were perceived as more appropriate when shared common ground was high than when it was low.

A production study by Jeff Hancock (2004), however, suggests that inferability and common ground assumptions may not function the same way in all discourse contexts. He asked pairs of college students, all of whom were strangers to each other, to interact either face-to-face or via a computer chat program. Both groups of conversational partners completed tasks designed to elicit the use of irony, such as commenting on badly dressed celebrities or disgusting foods. Since the computer partners couldn't see or hear each other, it was assumed they would have fewer ways to signal ironic intent, such as through facial expressions or by using an ironic tone of voice. Inferability would predict that they should use irony less, since the chances of miscommunication would be greater. In fact, the opposite pattern of results was found, with computer-linked pairs making *greater* use of verbal irony than the face-to-face partners. There are a number of explanations for why this may have happened. One is that computer-mediated interactions can become "hyperpersonal" (Walther, 1996), with great emphasis placed on creating a socially desirable persona. Since one discourse goal of verbal irony is humor, the partners interacting via chat programs may have decided that the risks of miscommunication were less important than coming across as a humorous and interesting conversational partner.

Finally, it should be noted that not all theorists share the belief that common ground is foundational to successful communication. Boaz Keysar and his colleagues have conducted several studies which suggest that speakers display an egocentric bias in the initial formulation of what they intend to say. People are, of course, capable of changing their speech plan in order to take into account the perspective of their conversational partners, but doing so requires additional time and processing (e.g., Barr & Keysar, 2005). In any case, whether this occurs at an early or late stage in language production, an awareness of shared common ground and the inferability of utterances is an essential part of achieving communicative success.

2.2 Situational constraints

As we have seen, a primary signifier of verbal irony is saying something other than, and often the opposite of, what is literally intended. If this is the case, then a potential ironist would seem to have many arrows in his or her communicative quiver. For example, she could choose to make a positive evaluation about a negative situation (e.g., "What lovely weather we're having!" about a dark and stormy

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day), or a negative evaluation about a positive situation (e.g., "What awful weather we're having!" in reference to a warm and sunny day). In theory, both statements should work equally well, since their nonliteral intent is equally clear. However, this appears not to be the case: ironists are more likely to make positive comments about negative outcomes than to make negative exclamations about positive outcomes.

This "asymmetry of affect" was described by Dan Sperber and Deirdre Wilson (Sperber & Wilson, 1981) as well as by psychologists Herb Clark and Richard Gerrig in the early 1980s, just as empirical work on verbal irony began to be more widely conducted. To explain this asymmetry, Clark and Gerrig suggested that "People tend to see the world according to norms of success and excellence" (Clark & Gerrig, 1984, p. 122). In other words, in some linguistic Eden, the weather is always pleasant, enterprises invariably meet with success, and friends are consistently loyal and helpful. In the world we actually live in, however, we experience stormy weather, financial setbacks, and friends who sometimes let us down. Therefore, we can be sarcastic with a friend who has offered to help us move but then fails to appear by remarking "Gee, thanks for all your help!" when encountering him at a later point in time. In other words, when life hands us lemons, we make ironic lemonade by alluding to these violated expectations (Kumon-Nakamura, Glucksberg, & Brown, 1995).

Neither Sperber and Wilson's description nor Clark and Gerrig's brief commentary provided empirical evidence to support a claim of asymmetry, but confirmation has been provided by several later studies. Sam Glucksberg and I, for example, demonstrated that research participants judged nonliteral positive statements as making more sense, as well as more sarcastic, than nonliteral negative statements (Kreuz & Glucksberg, 1989), and processing time studies have shown that positive statements of this type are comprehended more quickly than negative ones (Kreuz & Link, 2002). Kristen Link and I proposed referring to ironic positive evaluations as canonical irony, and ironic negative evaluations as noncanonical irony. And although most such studies have examined irony comprehension, production studies have provided some support for this asymmetry as well (Hancock, 2002).

It should be noted, however, that this asymmetry is not an absolute one. Many of the empirical results have shown that the difference is more a matter of degree than of kind – it is possible to infer the ironic intentions of someone who offers up a negative evaluation of a positive situation, although the attribution process in this case may be more complex and error-prone. For example, when asked why characters in short texts said what they did, participants would make reference to the speaker being in a bad mood, or as simply unable to appreciate pleasant weather (Kreuz, 1987).

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In addition, Kreuz and Glucksberg found that noncanonical ironic statements were readily interpreted as such if they were directed at a *victim* – that is, a specific target of the remark. If someone predicts foul weather, and the following day is pleasant, an ironist can sarcastically echo the negative, incorrect prediction as a way of teasing or criticizing the failed forecaster. Finally, in some cases, people really do expect negative outcomes, which implies that an instantiation of a negative cultural expectation should be perceived as ironic when a positive event occurs. One can imagine a soldier declaring "War is hell!" as he drinks a bottle of fine wine he has discovered in an abandoned house (Kreuz, 1996).

2.3 Discourse goals

It would be a mistake to assume that people deliberately choose to speak ironically, or metaphorically, or to employ a particular idiom when they speak. It might be more accurate to say that people use language in a way that best achieves their particular conversational ends. These ends can be thought of as the communicative intentions of speakers, such as to provide information, provoke thought, amuse, or express anger. Different scholars have alluded to this concept in a variety of ways. The philosopher John Austin, for example, characterized such intentions as having "illocutionary force" (Austin, 1962). This idea was expanded by John Searle, who proposed a system of specific illocutionary acts, such as directives (e.g., commanding), expressives (thanking), and declarations (excommunicating; Searle, 1975). Researchers have also attempted to distill speech acts inductively (D'Andrade & Wish, 1985) and to identify those used by young children (Dore, 1975). In the nonliteral language literature, Richard Roberts and I (1994) have used the term "discourse goals" to classify the reasons that someone might employ a particular figure of speech, and Herbert Colston has employed "pragmatic effects" to convey a similar idea (Colston, 2015). These terms differ in their granularity, and it is beyond the scope of this review to delineate exactly what is shared (and not shared) among them. For simplicity, the communicative intentions of speakers will be referred to as "discourse goals" in this chapter.

Some forms of nonliteral language are well suited for fulfilling certain kinds of discourse goals, whereas others are better suited for satisfying others. Similes and metaphors, for example, are often employed to clarify, whereas indirect requests, such as "Can you pass the salt?" are used to guide another's actions. In the case of verbal irony, two common discourse goals provided by research participants are that it is used to show negative emotion and to convey humor (Roberts & Kreuz, 1994). In many cultures, the display of negative emotion is problematic, since it can be face-threatening to the recipient (Brown & Levinson, 1978). Leavening a critique with humor, however, can lessen its negative impact (Dews, Kaplan, &

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Winner; 1995; Dews & Winner 1995). Viewed in this way, verbal irony allows speakers to accomplish discourse goals that would be difficult, if not impossible, to achieve through literal language alone.

Asking research participants to provide reasons for using a particular type of nonliteral expression can provide useful insights into why such language is used. However, it is also problematic, since thinking about language in the abstract may be very different from actual discourse. More specifically, this approach may tap into people's folk theories about various forms of language, as opposed to their actual language behavior (Gibbs & Colston, 2012). The belief that verbal irony can lessen the sting of a critical remark may be a good example of this. Some studies have shown that verbal irony can actually *enhance* the condemnation of another person (Colston, 1997; Colston, 2002). One's point of view is also important: the recipients of verbal irony perceive it as being more critical than do the ironists themselves (Bowes & Katz, 2011; Toplak & Katz, 2000). Finally, the type of speech act also plays a role: ironic insults are perceived as more teasing than literal insults, whereas ironic compliments are seen as less polite and more mocking than their literal counterparts (Pexman & Olineck, 2002). Verbal irony is a complex rhetorical device that can serve to both mute *and* enhance, to be more mocking but also more polite (Boylan & Katz, 2013). Given the variety of discourse contexts in which it is employed, it would clearly be too simplistic to conclude that verbal irony always functions in the same way. As Colston and Gibbs (2002b) point out, irony has the ability to both bond and to distance conversational partners, so any blanket statement about it being a positive or negative form of communication is incomplete at best.

2.4 Lexical cues

In the early 1990s, the novelist Douglas Coupland published two brief articles entitled "The Irony Board" in *The New Republic* (Coupland, 1992; 1993). He billed them as "A survey of words that can only be used 100% ironically" (1992, p. 12). He included "helpful criteria" for identifying such terms, such as "Could anyone under the age of 35 say this word with a straight face?". The list of over a hundred words and phrases includes entries like "groovy," "madcap," "*moi*," and "hot hubby." Although intended humorously, the article does make the point that particular terms are so commonly used nonliterally that they essentially function as irony markers (see Giora, Givoni, & Fein, 2015). Viewed in this way, such words and phrases could be said to function like idioms, which are frozen and often arbitrary phrases that have some other meaning, as in "kick the bucket" for "to die".

Lexicographers, who provide usage notes as well as definitions for words in dictionaries, must also deal with the issue of providing guidance about nonliteral

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usage to their readership. However, this guidance tends to be rare and somewhat inconsistent with regard to verbal irony. The sixth edition of *The Shorter Oxford English Dictionary* (2007), for example, contains more than 500,000 definitions, and an electronic version of that work can be searched for instances of the word "ironic" appearing in notes about usage. Only 140 words and phrases are identified as ironic, and even then, the usage notes are often qualified (e.g., "freq. iron.," "usu. iron.," "often iron."). For terms and senses that receive a bald-faced label of "iron.," there seems to be little rhyme or reason for these designations: the list includes nouns ("comedian," "feathered friend"), verbs ("decline with thanks," "shall"), and adjectives ("nice," "transcendent"), as well as clichés (e.g., "tell me about it," "warm reception"). Clearly, relying on dictionary definitions to determine ironic intent would be ill-advised. The real problem is that *every* term has the potential to be used in a nonliteral way, although some words may be used ironically more often than others.

Is it possible to find any consistency at the lexical level? Richard Roberts and I (Kreuz & Roberts, 1995) demonstrated the importance of exaggeration in verbal irony by showing that hyperbolic statements (e.g., "I'll never be able to repay you for your help!") are rated as more ironic than less extreme statements with similar meaning (e.g., "Thanks for helping me out"). We suggest that the use of exaggerated terms may generally function as a cue for ironic intent. In the tradition of Douglas Coupland, we proposed a random irony generator, in which just about any combination of hyperbolic adjectives and adverbs (e.g., "absolutely fantastic," "simply marvelous") seem to have an ironic tinge. Akira Utsumi (2000), in his implicit display theory of verbal irony, also tried to identify lexical factors that are consistently associated with ironic usage. He also points to the importance of exaggerated adjectives and adverbs, and suggests that interjections, such as "Oh!" or "Dear me!" could function as markers for irony.

In an attempt to determine whether these parts of speech function as reliable lexical markers for irony, Gina Caucci and I (2007) used Google Books to identify ecologically valid examples of sarcastic statements that had been employed in works of fiction. We searched for character dialog in which the phrase "said sarcastically" was spoken by one of the characters. The paragraph containing the dialog, as well as two paragraphs of context before and after the sarcastic remark, were given to research participants to evaluate. The words "said sarcastically" were removed from each excerpt, so there was no explicit marker of nonliteral intent. Nonetheless, the participants rated such character dialog as more sarcastic than control items, selected in a similar way from Google Books, in which the author had simply used the phrase "I/he/she said." Although the presence of adverbs and adjectives in the dialog was not a significant predictor of the subjects' ratings, the presence of interjections was.

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A later study also employed a corpus of "said sarcastically" dialog drawn from Google Books (Kovaz, Kreuz, & Riordan, 2013). Compared to nonsarcastic control statements also chosen at random from the same texts, the dialog marked as sarcastic by the author contained more positive emotion words. This finding provides support for claims about the asymmetry of affect described earlier. As in the Kreuz and Caucci (2007) study, the presence of adjectives and adverbs was not reliably higher in the sarcastic character dialog when compared to the literal dialog. Interjections, however, were used more by authors when their characters were speaking sarcastically, and this is also consistent with the earlier study.

We will return to the issue of using lexical features to detect verbal irony in our later discussion of sentiment analysis. At this juncture, however, a word of caution is in order. It may well be that there are many lexical cues and features that ironists *can* press into service to achieve their nonliteral ends, but they may not serve as absolute guideposts with regard to intent. For example, repetitions are common in verbal irony ("nice … really nice"), but they are also common in literal language as well: the word "nice" can also be repeated when issuing a sincere compliment. In a similar way, someone speaking sarcastically may make use of mock politeness, but these two concepts are not equivalent (Taylor, 2015). Certain ways of speaking may be stereotypically *associated* with nonliteral intent, but a primary reason for failures in communication is that all of these features and cues are employed in literal language as well.

2.5 Kinesic cues

Conversational partners who employ verbal irony in face-to-face contexts don't just have words at their disposal – they also have a wide variety of facial expressions and gestural cues that can be pressed into service to signal their nonliteral intentions. These kinesic cues, or "body language" as it is more commonly called, may not be culturally universal: the meaning of some hand signals, such as the "OK" gesture (touching the tip of the index finger and thumb together), vary widely, and may be perceived as offensive or vulgar in some parts of the world (Kreuz & Roberts, 2017). However, research conducted on verbal irony in Europe and North America has identified a number of kinesic cues that co-occur with such speech.

In a study conducted by Patricia Rockwell (2001), research participants were videotaped as they answered questions designed to elicit sarcasm. For example, they were asked "Why do you like going to the dentist?" (p. 48). Two coders reviewed the participants' verbal responses to identify sarcastic and literal answers, and then two other coders studied the facial expressions of the subjects as they uttered their responses. Specifically, they counted the number of expressive movements in the regions of the participants' eyebrows, eyes, and mouth. Although no

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difference was found with regard to eyebrow movement, the participants made mouth movements twice as often when they were speaking sarcastically as when they were expressing themselves literally. (Interestingly, the raising or lowering of the mouth corners has also been shown to be an important linguistic cue for irony in Italian Sign Language; Mantovan, Giustolisi, & Panzeri, 2019.)

Research conducted by Sabina Tabacaru and Maarten Lemmens (2014) used excerpts from two American television programs (*House MD* and *The Big Bang Theory*) to see if raised eyebrows function as a marker for humorous sarcasm or "hyper-understanding," which they defined as playful echoes of conversational partners' prior utterances. They found that eyebrow raising frequently co-occurred with both verbal sarcasm and hyper-understanding, and concluded that raised eyebrows can help to emphasize or even trigger a humorous interpretation. It's important to note, however, that the researchers only considered the humorous aspect of such speech; as discussed earlier, verbal irony can fulfill a variety of different discourse goals besides humor. In addition, as the authors themselves admit, trained actors may consciously or unconsciously exaggerate their facial expressions to emphasize their utterances and their humorous intent. Nonetheless, it seems clear that eyebrow raises can serve as an irony marker in at least some situations.

In a study conducted by Caucci, Kreuz, and Buder (2008), pairs of friends and strangers were videotaped as they completed tasks designed to elicit verbal irony. Examples of both sarcastic and literal utterances made by the participants were identified. These were coded for 19 distinct movements of the head, eyes and mouth, following a taxonomy developed by Louwerse et al. (2007). Five of these movements accompanied sarcastic statements significantly more often in comparison to literal statements: slow nods, looking to one's conversational partner, smiling, lip tightening, and laughter. This study is consistent with Rockwell's (2001) finding concerning mouth movements as a cue for verbal irony. And although the subjects in this experiment did raise their eyebrows more often when speaking sarcastically than literally, as in the Tabacaru and Lemmens (2014) study, the difference did not reach statistical significance. The finding that speakers look to their partners more often when speaking ironically suggests that this may serve as a way of signaling the nonliteral intent of what is being said, or possibly as a comprehension check to see if the remark was understood as intended.

The timing of gestural cues can also be exploited by a potential ironist. González-Fuente, Escandell-Vidal and Prieto (2015) explored whether gestural codas might be used as a reliable marker for irony. They defined these codas as visual cues produced after ironic utterances, including changes in gaze, eyebrows, head tilting and nodding, and shoulder shrugging. They videotaped pairs of friends interacting in Catalan, then extracted ironic utterances and analyzed them.

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They found that the majority of ironic utterances were followed by such codas, and that they were relatively less common in literal speech. Other speakers of Catalan who viewed these productions were more likely to infer ironic intent when these codas were present than when they were absent. Although such gestural codas can be added deliberately, it is likely that in many situations, ironists incorporate such codas without even being aware that they are doing so.

A number of other facial movements and gestures have been discussed as possibly serving as cues for ironic intent. These include opening one's eyes wide (Attardo, Eisterhold, Hay, & Poggi, 2003), winking (Muecke, 1978), and air quotes (Haiman, 1998). It certainly is the case that such movements are stereotypically associated with nonliteral language. However, whether such movements more often accompany nonliteral rather than literal statements has yet to be determined. In addition, it should be acknowledged that in some cases an ironist may deliberately choose to accompany her speech with a completely blank or deadpan expression. Attardo et al. (2003) showed research participants short clips from a variety of American situation comedies and asked them to describe the faces of the actors. In a subset of cases, many of the subjects spontaneously described the ironists as having facial expressions that were blank, stone-faced, or otherwise expressionless. This may be an example of linguistic pretense, in which the ironist pretends to intend the literal meaning of his words. A deadpan expression might also serve to communicate intimacy: if the inferability of a nonliteral utterance is already very high, it should not be necessary for intimates to gild the lily by creating an exaggerated display via the face or voice.

The kinesic signaling of nonliteral intent in sign languages presents particular challenges for the would-be ironist. This intention can be accomplished in many ways, via nonmanual markers that can include mouth shape (as mentioned earlier), head tilting, shoulder raising, eye blinks, and the like (e.g., Hermann, 2010). It has been argued by Napoli and Sutton-Spence (2010) that there may be an upper limit for articulating simultaneous propositions, perhaps because of working memory limitations. Therefore, the signing ironist must be adept at both conveying her meaning and also her attitude toward that meaning, such as negating its literal interpretation with a particular facial expression.

2.6 The ironic tone of voice

Beyond lexical and kinesic cues, there have been many suggestions that verbal irony is signaled by a particular tone of voice (e.g., Cutler, 1974; Rockwell, 2000). Apart from the assertion that such a tone of voice exists, there is somewhat mixed agreement regarding what this tone is, and when and why it is used. There are some consistencies in the literature, such as the observation that there are generally

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changes in pitch, variability of pitch (e.g., animated, monotone), loudness, and rate of speech. However, even the direction of these changes is a subject of debate. For example, some have argued that sarcastic irony is marked by a heightened pitch, while others have asserted that sarcasm is marked by a reduction in pitch. Despite these contradictions, some general patterns have emerged, suggesting a particular tone of voice is associated with verbal irony.

Bryant and Fox Tree (2005) asked participants how they assessed whether a statement was ironic or not. They responded that they used speed and tone in their judgments (e.g., "when the voice changed from low to high to low and got louder and faster" [Bryant & Fox Tree, 2005, p. 270]). Bryant and Fox Tree also speculated that an ironic *rhythm* of voice may be a factor (2005). In support of this, several studies have confirmed that the ironic tone of voice may be associated with slower tempo (Cheang & Pell, 2008; Rockwell, 2000; 2007a; Voyer & Techentin, 2010) or a lengthened rate of articulation (Anolli, Ciceri, & Infantino, 2002). Consistent with this, Peters and Almor (2016) used decreased speed as one parameter for creating a sarcastic sentence from a sincere recording, which participants rated as more sarcastic. In short, there is a fair amount of support for a slower tempo or rate of articulation for ironic speech.

With regard to pitch, as mentioned earlier, the evidence is more mixed. Of the experiments in which this feature was studied, most found that sarcasm is marked by a lower pitch (Cheang & Pell, 2008; Peters & Almor, 2016; Rockwell, 2000; Voyer & Techentin, 2010). However, some researchers have found that sarcasm is associated with a higher pitch (Anolli et al., 2000; 2002), whereas others found no difference (Bryant & Fox Tree, 2005; Rockwell, 2007a). There is greater consistency in reports of changes in pitch variability for sarcastic utterances. However, the direction of the change is inconsistent: some studies have identified more variability (e.g., Anolli et al., 2002) whereas others have measured a more restricted range (e.g., Cheang & Pell, 2008).

One reason for such inconsistent results may be the ways in which verbal irony is signaled by trained actors versus those without such training. Rockwell (2000) recruited radio announcers and other professionally trained speakers, Anolli et al. (2000) used reader-actors, and Bryant and Fox Tree (2002; 2005) used excerpts from talk radio programs. Bryant and Fox Tree (2005) suggested that the articulations of professionals may not necessarily reflect the vocal patterns used by those without vocal training. In support of this, Rockwell (2000) found that spontaneously produced sarcastic and nonsarcastic statements were not distinguishable and that only *posed* sarcastic vignettes (i.e., statements for which speakers were instructed to speak sarcastically) were rated as more sarcastic, based on these vocal changes. Therefore, it may be that an actor's ironic tone of voice is identifiable because it *sounds* like the stereotypical actor's ironic tone of voice.

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Although it has been studied much less, there are likely differences in the ironic tone of voice based on cultural and linguistic differences. For example, both studies by Anolli et al. (2000; 2002) were conducted in Italian. Therefore, the results may not be comparable to studies conducted in English. In further support of linguistic differences, Cheang and Pell (2009) performed a study examining the sarcastic tone of voice using native Cantonese speakers and a procedure that was identical to their prior study using English speakers (Cheang & Pell, 2008). They found that in Cantonese, speakers marked sarcasm with a higher pitch and narrower range, while their English speakers marked sarcasm using a lower pitch (Cheang & Pell, 2009). They also point out that this heightened pitch was observed in Italian (Anolli et al., 2002) and French (Laval & Bert-Erboul, 2005). Whether these differences are a product of varying social norms or linguistic variation is not clear, but they add a layer of complexity in making assertions about a universal tone of voice that is perceived as ironic.

There are a number of other issues that are involved with an ironic tone of voice. For example, Anolli et al. (2002) found that there are some minor differences between the ironic tone of voice when used in a context of conflict (i.e., ironic criticism) and a context of cooperation (i.e., ironic praise). It has also been suggested that the ironic tone of voice may be related to other nonliteral forms, such as hyperbole (Kreuz & Roberts, 1995), and that it may overlap with acoustic markers of humor (Cheang & Pell, 2008). Other interacting factors are facial expressions that accompany sarcasm, such as a sneer, which may influence other features, such as nasality (Cheang & Pell, 2008). Taken together, these findings do suggest the existence of an ironic tone of voice. However, it is not clear if this tone is derived from social norms concerning what irony *should* sound like (e.g., how actors portray it), whether it is influenced by use of concurrent nonliteral language (e.g., humor, hyperbole), or whether it represents a wholly unique phenomenon. What does seem clear, at present, is that the ironic tone of voice – at least in English – may best be described, as it was by Rockwell (2000), as speech that is lower, slower, and louder.

3. Individual differences

Are some people more likely to express themselves ironically than others? And if so, are there consistent demographic or psychological differences between inveterate ironists and those who rely more heavily on literal language? A number of experiments have been conducted to address such questions, and several others have included individual differences measures within larger studies. Researchers

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have principally explored whether gender or personality influence irony production, and these findings are summarized below.

Gender differences

In an early study of gender and nonliteral language, Julia Jorgensen (1996) found that men were more likely to perceive sarcastic irony as humorous. Women, on the other hand, were more likely to take offense or be angered by such language. Later research has painted a consistent picture with regard to gender and irony. For example, in his study of irony use among friends described earlier, Gibbs (2000) found that men employed sarcastic verbal irony more than women. Herbert Colston and Sabrina Lee (2004) reported that people are more likely to imagine a hypothetical ironist as a man, and that men self-report using verbal irony more than women. Stacey Ivanko, Penny Pexman, and Kara Olineck (2004), who developed a sarcasm self-report scale, also found higher rates of verbal irony use by men than by women. In addition, men were more likely to employ sarcasm in a forced-choice production task. These findings were largely echoed in a study by Dress, Kreuz, Link, and Caucci (2008), who used the same self-report scale: the male participants claimed to use more sarcasm than the female subjects, even though men and women were equally likely to employ verbal irony in a free response task.

Patricia Rockwell and Evelyn Theriot (2001) asked same and mixed-sex dyads to answer questions designed to encourage sarcastic statements in the context of a conversation. They also found that men used sarcasm more than women, but that they also employed sarcasm more when speaking to other men than to women. The female participants, for their part, were also more sarcastic when speaking to men than to other women. A similar pattern of results was observed in a later study by Drucker, Fein, Bergerbest, and Giora (2014). These results can help explain why the behavioral data don't always align with the self-report data with regard to sarcasm production. It may be the case that both men and women assess their use of verbal irony by reflecting on their conversations with same-sex partners. Colston and Lee have interpreted such gender differences as reflecting a greater propensity for risk taking on the part of men, consistent with the notion that ironic speech is a riskier form of communication. Karen Hussey and Albert Katz (2006) asked pairs of men or women to interact via chat software, and interpreted males' greater likelihood to use metaphors as additional evidence of greater conversational risk-taking by men.

In terms of irony comprehension, on the other hand, there appears to be little difference between men and women. Baptista, Macedo, and Boggio (2015)

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investigated eye-tracking in the context of making sense of cartoons that illustrated literal and ironic situations. Although women had more fixations than men, their eye movements were otherwise similar.

3.1 Personality differences

A recent topic of interest among researchers has been to determine whether the use of verbal irony reflects some predisposition rooted in an individual's character or temperament. This topic has been characterized as "virgin soil" for irony researchers (Bruntsch, Hofmann, & Ruch, 2016). Bruntsch and his colleagues define a "sense of irony" relatively narrowly, linking it primarily to humor, but suggest that such a sense could be a durable personality trait that differs from person to person. Support for this notion can be found in the work of Ivanko et al. described earlier: they found that there is variability in verbal irony use and that these differences can be reliably measured. In addition, these self-report differences predict behavioral measures, such as reading times for literal versus ironic statements. However, as the authors themselves admit, the amount of variance explained by individual difference measures, at least in the context of their study, is relatively small.

In an attempt to identify specific personality correlates, Madga Gucman (2016) had Polish-speaking university students rate ironic and literal statements on a number of dimensions. The subjects also completed questionnaires that measured social competence and anxiety. Gucman found that subjects with higher self-reported levels of anxiety perceived ironic statements as more critical and more offensive than low anxiety participants.

3.2 Cognitive differences

Individual differences in processing sarcasm have also been observed in a study of eye movements. Olkoniemi, Ranta, and Kaakinen (2016) asked Finnish university students to read literal, metaphoric, and sarcastic versions of stories, as well as to complete a number of cognitive measures. They found that participants with higher working memory capacity found it easier to recognize sarcasm (as measured by rereading), perhaps because they were better able to hold both the literal and nonliteral interpretations in memory at the same time. They also reported that lower scores on a measure designed to assess making use of emotional information in decision making were related to participants taking more time to look back at the story contexts. The researchers suggest this reflects the slower interpretation of emotional cues, and therefore more of a need to rely on context to arrive at a sarcastic interpretation. Although this was a comprehension study, it suggests that ironists may be less likely to employ such language when they believe their

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conversational partners are less cognitively able to infer their nonliteral intent. This might include, for example, adults diagnosed with attention deficit hyperactivity disorder (ADHD), since that syndrome is associated with working memory impairment (e.g., Schweitzer, Hanford, & Medoff, 2006).

4. Cultural differences

4.1 Linguistic and cultural variation

As described earlier, verbal irony is used to accomplish a number of diverse discourse goals. These goals, however, have been shown to differ by language and by culture. A study by Jiyun Kim (2014), for example, suggests that non-native speakers view pragmatically complex utterances through the lens of their native language, instead of adopting the cultural frames employed by speakers of the target language. Specifically, Kim found that native Korean speakers learning English have very different ideas about the appropriateness of sarcasm use. She interviewed her study participants to determine their attitudes about sarcasm with regard to speaker intent and attitudes, and also asked about the cues they used to identify sarcasm. She found that, compared to native English speakers, the Korean participants described sarcasm quite negatively, and as "insulting, biting, and offensive" (Kim, 2014, p. 198). In short, they considered it to be generally taboo, but they did acknowledge its utility in expressing criticism and discomfort by indirect means.

Kim also had the Korean participants as well as monolingual English speakers watch and identify sarcasm in video clips from the US television program *Friends*. She found that, in comparison to the native English participants, the Korean subjects were much more attuned to the use of counterfactual statements. They identified sarcasm in cases where a character in the program stated something that was clearly untrue, but also in instances that involved saying something that was obviously true, or when rhetorical questions were employed. They also relied heavily on visual cues like giggling, sneering, and exaggerated bodily motions. The native English participants, on the other hand, were more likely to identify sarcasm based on formulaic expressions (such as "Oh, great"), and a particular tone of voice. It's easy to imagine an American trying to signal verbal irony to a non-native English speaker, and failing in this effort because of different cultural frames and cues.

In theory, it should be possible to create verbal irony by playing off the norms and frames that exist within a given culture. A good test case would be a language like Japanese, in which politeness is explicitly marked by the use of honorifics, and function as part of the language's grammar. In such a language, it should be possible to exploit these cultural expectations to achieve ironic or sarcastic effects. In

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two experiments, Shinichiro Okamoto (2002) showed that, in at least some contexts, being overpolite was perceived as being ironic. This also occurs in English, as when a student uses a term like "doctor" or "professor" to tease a classmate about performing poorly on an exam ("Doctor know-it-all got a perfect score!"). It should be noted, however, that being overly polite does not always signal irony: a study of Swedish allergists found that they used extremely formal, polite forms (like "your ladyship") with their pediatric patients in order to build rapport and to reduce the stress and anxiety of being examined (Aronsson & Rundström, 1989).

If the use of verbal irony varies by language and by culture, then we might predict that non-native speakers would be less accurate in making use of irony markers when compared to native speakers. This seems to be true in at least one case: Arabic speakers learning English are less likely to make use of prosodic cues for irony when compared to native English speakers (Peters, Wilson, Boitau, Gelormini-Lezama, & Almor, 2016). And it is the case that the acoustic markers of sarcasm differ by language, as was demonstrated in a study of Cantonese compared to English (Cheang & Pell, 2009). In fact, Cantonese speakers with no knowledge of English (and the reverse) perform no better than chance in detecting sarcasm in the unfamiliar language (Cheang & Pell, 2011). However, as second language learners become more proficient, they become able to process ironic statements as quickly as native speakers, although they make more errors in a timespan-limited response paradigm (Bromberek-Dyzman & Rataj, 2016).

4.2 Regional variation

It would be a mistake to assume that, even within the same language, the use of verbal irony can be described and studied as if it were a monolithic phenomenon. Just as there are differences in custom, accent, and word choice within a country, there may be pragmatic differences as well. Such differences could include the propensity to use irony, as well as the reasons for such use. This possibility was explored by Dress, Kreuz, Link, and Caucci (2008). We gave US participants brief scenarios that described a conversation between two people, with the last statement left blank. The subjects' task was to complete the scenario with a statement that the character would be likely to say. Some of the scenarios were written in such a way that an ironic statement would be likely: in these, one character made a positive prediction (such as forecasting good weather), but then the prediction fails (the next day's weather is stormy). The other character's evaluation of this state of affairs was left blank, but the situation has created a potential ironic victim (the failed predictor), and so a sarcastic completion is both possible and pragmatically appropriate.

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Dress et al. gave these scenarios to participants in Oswego (upstate) New York and Memphis Tennessee, and also asked for definitions of irony and sarcasm. The northern participants provided ironic completions significantly more often than the southern participants (22% versus 14%). The two groups of participants also differed in how they defined irony and sarcasm, with the New York participants more likely to mention the concept of humor in their definition of sarcasm than the Tennessee subjects. Although there are undoubtedly many potential reasons for these results, one explanation might involve the southern "culture of honor," in which potential face threats are more likely to be responded to in an aggressive way (Nisbett & Cohen, 1996). If southern participants view sarcasm as more aggressive than humorous, they might employ it less often in order to avoid creating hostility.

5. Computer-mediated communication

The popularity of email, texting, and other forms of electronic communication has created new challenges in the production and comprehension of verbal irony. While using verbal irony in any context can be risky, computer-mediated communication (CMC) presents some novel challenges for the would-be ironist. Because the conversational partners are not interacting face to face, many of the cues that signal verbal irony cannot be exploited in this context. And without such explicit cues, the possibility of miscommunication becomes more likely. For example, CMC situations prevent the speaker from using many of the nonverbal and situational cues that were reviewed earlier. As we have seen, certain facial expressions and gestures are used to signal verbal irony, including a blank stare or "deadpan face" (Attardo et al., 2003). In addition, certain types of mouth movements (Rockwell, 2001), gaze (Williams, Burns, & Harmon, 2009), and other cues can be employed when talking face to face. Without these cues, the ironist is limited in her ability to signal her ironic intent. Although these cues are also lacking in other written forms of irony, CMC adds an additional constraint: messages like texts and tweets are typically quite brief.

Beyond facial expressions, tone of voice, and gesture, many other types of cues are absent in CMC settings, as well. As discussed earlier, common ground is an important factor in determining the inferability of verbal irony. While there are different forms of common ground, such as physical copresence or community membership, such cues are very limited in CMC settings. Some, such as physical copresence, may be completely absent, while others, such as shared community membership, may be available in some cases but not in others (e.g., email between coworkers or between people who have never met). Furthermore, because ironic utterances increase the risk of miscommunication, it has been suggested that the

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ironist may look for clues from the listener to ensure that the message was not interpreted literally (Gibbs, 2000). Several researchers have demonstrated that the listener will frequently laugh or smile, or will produce their own ironic comment in response to the speaker's (Gibbs, 2000; Hancock, 2004). In CMC settings, the ironist has almost no ability to ensure that his message was interpreted correctly. And even if feedback is provided, it may be very delayed.

With all the limitations facing the would-be ironist in CMC settings, the inferability of such nonliteral language should be quite low (Kreuz, 1996). Therefore, one might expect that people would employ irony less frequently in such contexts. However, based on the limited evidence available, this does not appear to be the case. Several explanations for the frequent use of verbal irony in CMC settings were suggested by Hancock (2004). These include the anonymity afforded to the participants in his study, which may have led them to change their conversational goals from politeness and self-protection to other goals, such as being perceived as being funny. Alternatively, Hancock suggests that more frequent verbal irony use in CMC settings may reflect an attempt by speakers to express relational information through humor. In fact, the use of verbal irony appears to be in no great danger in a world in which everyone is always online. Although traditional cues may be lacking or absent in CMC settings, it has been shown that digital ironists instead rely on alternate methods of signaling their ironic intent, such as with emoticons, emoji, punctuation, or other linguistic cues.

5.1 Emoticons and emojis

The use of emoticons and emojis are popular ways of increasing the likelihood of verbal irony being properly interpreted in online settings (e.g., Filik et al., 2016). In several studies, specific emoticons – most notably, the wink ;) and tongue : p emoticons – were rated by participants as indicative of sarcasm (Derks, Bos, & von Grumbkow, 2008; Thompson & Filik, 2016; Walther & D'Addario, 2001). However, while individuals may perceive utterances with emoticons as sarcastic, it cannot necessarily be inferred that ironists use emoticons as a primary means of signaling ironic intent. Several studies have sought to examine the use of emoticons and other textual devices in the production of irony, as opposed to the perception of it.

Some researchers have argued that emoticons serve to strengthen the emotional impact of sarcastic remarks, as in studies in which a smile emoticon :) was employed in conjunction with positive messages (Derks et al., 2008; Thompson & Filik, 2016; Thompson, Mackenzie, Leuthold , & Filik, 2016). Conversely, it has been asserted that while emoticons may signal sarcasm, they only enhance perceptions of verbal irony in contexts that might be ambiguous. One study found that the use of emoticons and other textual devices (e.g., ellipses, punctuation marks)

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only increased ratings of sarcasm when the observed statement was intended to be literal (Filik et al., 2016). That is, emoticons did not clarify sarcastic intent in situations where its intent was unambiguous. This observation is in alignment with the assertion by Walther and D'Addario (2001), who suggested that the influence of emoticons is much weaker than the verbal message itself.

In a second study by Filik et al. (2016), participants were asked to evaluate more ambiguous statements, and in this experiment, they found that wink emoticons produced higher ratings of sarcasm. They suggest, therefore, that while emoticons may signal sarcasm, they more likely serve as a complementary signal, with the content of the actual written message serving as a more reliable indicator of the ironic intent of the message. This notion received additional support in an experiment in which participants were instructed to create a response that clearly indicated whether they were responding literally or sarcastically. Emoticons were used more frequently than punctuation or other markers, but still only appeared in just over half of the responses (Thompson & Filik, 2016).

Since emoticons alone may be insufficient indicators of sarcastic intent, their frequent use, as well as their association with sarcasm, has raised questions regarding the function that they serve in CMC. One explanation is consistent with the *tinge hypothesis,* which suggests that sarcasm serves to "mute the emotional impact of both criticism and praise" (Filik et al., 2016, p. 2). According to this view, ironic criticism is viewed as less negative than literal criticism, and ironic praise is viewed as less positive than literal praise (Dews & Winner, 1995). Consistent with this notion, it has been shown that ironic criticism is viewed as less negative and ironic praise less positive in CMC settings, and that these effects are further enhanced by the use of emoticons (Filik et al., 2016). As such, emoticons may serve to lessen the emotional impact of a sarcastic message.

Although there is inconsistency in the findings related to the use of emoticons, these results are not necessarily contradictory. For example, a study utilizing electrophysiological measures by Thompson et al. (2016) found support for both a stronger emotional response to statements which utilize emoticons and a weaker emotional response to sarcastic praise and criticism. This supports previous findings concerning the emotionally enhancing effects of emoticons, as well as the muting effects consistent with the tinge hypothesis. It seems that emoticons may assist the online ironist in signaling sarcasm, particularly in ambiguous contexts, where the risk of miscommunication is greater.

5.2 Other ways to signal sarcasm online

While emoticons may assist in signaling ironic intent, particularly in ambiguous contexts, other discourse markers may be employed as well. These include

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ellipses, exclamation points and other typographic symbols, interjections, and other linguistic markers (Kunneman, Liebrecht, van Mulken, & van den Bosch, 2015; Whalen, Pexman, & Gill, 2009). Among these, the use of ellipses and other typographic markers have been examined in studies of irony production in CMC settings, and they do seem to function as markers for verbal irony. Hancock (2004) suggested that ellipses and other punctuation symbols are more strongly associated with sarcasm than are emoticons, and a subsequent study demonstrated that exclamation points, hyphens, parentheses, and ellipses were the most commonly used devices to signal nonliteral language broadly (Whalen et al., 2009). However, others have shown that typographic markers are used less frequently than emoticons (Carvalho, Sarmento, Silva, & De Oliveira, 2009; Filik et al., 2016; Thompson & Filik, 2016). Therefore, it appears that emoticons may be more commonly used than typographic markers, but, these other markers should also be viewed as effective markers of sarcastic intent.

Although this discussion has focused largely on explicit cues used to signal verbal irony, there are, as we have seen, many other tools that the ironist can exploit. Unfortunately, with regard to CMC, there is at present little research on the contributions of common ground or other situational cues used in face to face settings. This may be due in part to the difficulties involved in studying these factors experimentally. For example, text messages are commonly exchanged between individuals with a close relationship, whereas posts to social media sites like Facebook or Twitter, where an individual may have hundreds or thousands of followers, present very different communicative issues. (This phenomenon has been referred to as context collapse; see Marwick & boyd, 2011). Therefore, examining the effects of common ground on language use in social media may produce very different results than examining the same factors in texting. Despite these issues, a number of approaches have been devised to examine specific factors contributing to irony production in specific communicative contexts. The most notable of these is the growing body of research on sentiment analysis and sarcasm detection in posts on Twitter.

6. Twitter, sentiment analysis, and verbal irony

The Twitter platform has many of the same limitations as other forms of CMC for the would-be ironist, as well as other complications that are unique to it. The most significant of these is the restriction that posts (tweets) were originally limited to 140 characters. Therefore, there is much less space to employ any verbose cues for verbal irony. Twitter ironists, therefore, make use of alternative methods for signaling their nonliteral intent. Many of these markers are shared with other

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forms of CMC, such as emoticons or the creative use of punctuation, whereas others, such as hashtags, are used far more often on particular platforms such as Twitter (e.g., Bamman & Smith, 2016). The particular constraints of the Twitter platform provide researchers with unique challenges for identifying how ironists communicate their intentions, as well as how to detect such nonliteral intent using linguistic algorithms.

The popularity of Twitter and other forms of social media have caused many groups to seek ways to determine the public's attitudes towards their products, services, or messages. *Sentiment analysis*, also sometimes referred to as *opinion mining*, focuses "…on opinions which express or imply positive or negative sentiments" (Liu, 2012, p. 1). Although the terms sentiment analysis and opinion mining may be used to represent distinct activities, the former is commonly used as a general term representing all related procedures (e.g. Liu, 2012) and will be used here as well. It is also worth noting that sentiment analysis is not exclusive to Twitter. Other forms of online activity have also been analyzed, such as Reddit (Wallace, Choe, Kertz, & Charniak, 2014), Amazon reviews (Davidov, Tsur, & Rappoport, 2010), and even IMDb movie reviews (Pang, Lee, & Vaithyanathan, 2002). Although the goal in most of this research is to find the precise combination of features that provides the best classification of sentiment and irony, this section will focus on how the various features employed in creating these systems can inform our understanding of verbal irony use online.

6.1 The problem of irony

Sentiment analysis programs and procedures are frequently based on sentiment polarity – certain positive or negative sentiment words, such as *good, amazing, bad*, or *terrible* (Pang & Lee, 2008). However, this method runs into serious issues when classifying ironic statements. These issues arise as ironic utterances are intended to convey the opposite meaning of what is literally said. Below is an example from Rajadesingan, Zafarani, and Liu (2015, p. 98) which illustrates how an airline company failed to detect a sarcastic tweet, leading to further frustration on the part of the customer:

Customer: YOU ARE DOING GREAT! WHO COULD PREDICT HEAVY TRAVEL BETWEEN #THANKSGIVING AND #NEWYEARSEVE. AND BAD COLD WEATHER IN DEC! CRAZY!

Airline: We #love the kind words! Thanks so much.

Customer: WOW, JUST WOW, I GUESS I SHOULD HAVE #SARCASM

Clearly, the inability to detect ironic utterances online can lead to embarrassing miscommunication issues between corporations and their patrons.

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Sentiment analysis is frequently used to evaluate attitudes toward a certain product or service. This is particularly problematic due to the asymmetry of affect described earlier: the observation that it is much more common to ironically make a positive evaluation of a negative outcome than the reverse. For this reason, a company interested in customer perceptions of their product will more often mistakenly believe that customers view their product more positively than they actually do. Verbal irony has presented a significant challenge for sentiment analysis and has led researchers to adopt many different methods in an attempt to identify ironic utterances online.

6.2 Identifying irony online

There is a large and rapidly growing body of literature which has provided many approaches to more accurately identifying ironic statements, particularly those on Twitter. It would be beyond the scope of this chapter to fully review this research. Instead, the goal of this section is to identify some categories of features which have proven most useful in identifying ironic tweets, and how this relates to verbal irony production in face to face communication.

The majority of the sentiment analysis literature utilizes linguistic features to identify ironic tweets. This research has found that predictors of sarcasm and irony include emoticons, adjectives, and adverbs (e.g., Rajadesingan et al., 2015), as well as intensifiers – strong adjectives and adverbs (e.g., Kunneman et al., 2015). However, other features have been explored as well. Bamman and Smith (2015), for example, sought to incorporate more contextual factors, including features of the authors' historical tweets and previous interactions between the authors and audience. Although all classes of features improved the reliability of classification, the greatest predictor was *author historical salient terms*. This classifier looked at the historical tweets of a particular author and identified the 100 most salient terms, using TF-IDF scores.[1] The frequent use of certain terms was one of the best ways to differentiate sarcastic tweets from literal posts (Bamman & Smith, 2015). This finding reinforces the idea that there may be particular behavioral, linguistic, or personality traits associated with verbal irony use.

Another approach, created by Rajadesingan et al. (2015), called SCUBA, examined contrasting sentiments, cognitive complexity, emotional expression, the

1. Term Frequency-Inverse Document Frequency (TF-IDF) is a method of comparing the frequency of words in a specific document to the inverse function of these words in all documents. This gives a higher value to words found frequently in several documents, and a lower value to words found throughout all documents (e.g., articles like *a* or *the*), which allows detection of unique words frequently used in several documents (e.g., Ramos, 2003).

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relationship between speaker and audience, and several other categories of features. Of these features, all categories contributed somewhat to improved classification. The ten most discriminating features were identified, and it was found that emoticons and adjectives were the most diagnostic, with past word sentiment (i.e., very strong positive words and negative words), complexity (i.e., word length and lexical density), contrast, and familiarity-based features all proving highly informative as well. As in face to face settings, then, there does not appear to be any one feature that is uniformly representative of ironic tweets. Instead, it is a collection of features that best signals ironic intent.

Yet another approach has been to identify both low- and high-level textual properties that can distinguish ironic messages from those that are literal. Reyes et al. (2013), for example, have highlighted the importance of factors like representativeness – the message's appropriateness in a given context – and relevance, such as its unexpectedness or pleasantness. As they point out, no one factor seems to capture irony's essence, but a combination of such factors may provide a decent level of discrimination.

One potential limitation of this work is that many studies use tweets containing an irony-related hashtag (e.g., #sarcasm) to train their classifiers. This may be problematic as research comparing marked and unmarked tweets has shown very different patterns of other linguistic signals. Kunneman et al. (2015) showed that when hashtags are used, the majority of tweets contained few, if any, other signals (e.g., adjectives). However, when these explicit markers are absent, unintensified adjectives and other signals are used more frequently. Therefore, although these classifiers may produce fairly accurate assessments of explicitly labelled sarcasm, they may not be as accurate at identifying unlabeled sarcasm.

The modified use of linguistic signals as a result of explicit sarcasm labels may also explain why lexical factors are not always identified as strong predictors of verbal irony. For example, Gina Caucci and I (Kreuz & Caucci, 2007) used segments of text marked by the phrase "said sarcastically" as a corpus for participants to classify as sarcastic or not. We then coded for several lexical factors, including adjectives, adverbs, and interjections. We found that only interjections were a significant predictor of sarcasm. Based on the differences seen in Kunneman et al. (2015), however, it is possible that these lexical factors were weak or absent as the phrase *said sarcastically* served as an explicit label, similar to the #sarcasm hashtag.

If we compare the sentiment analysis literature with the traditional literature on face to face communication, some similarities and some differences can be identified. As with face to face interactions, the individual producing an ironic tweet or message still tends to exploit certain linguistic markers, such as a greater use of adjectives and a preference for positively evaluating negative situations. Furthermore, sentiment analysis has identified some features which have not been studied

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in the psychology lab, such as the historical interaction between the speaker and her audience, a preference for certain words, and cognitive complexity (which was also suggested by Rockwell, 2007b for face to face communication). Based on the findings from the sentiment analysis literature, it can be concluded that, although the medium for these ironic utterances poses challenges for the would-be ironist, approaches to signaling sarcasm online have been adopted which overlap substantially with those seen in written irony, as well as in face to face communication.

7. Unanswered questions

Although much has been discovered about how and why people use verbal irony, there are still many outstanding questions. One of these brings us full circle to the beginning of this review: can we make a rigorous distinction between the concepts of sarcasm and verbal irony, or is such an enterprise fundamentally misguided? And if we can draw a distinction, how might these forms be differentiated from their pragmatic neighbors, such as being facetious or sardonic, or engaging in banter, repartee, and teasing? Identifying specific discourse goals, as well as vocal, facial, and gestural correlates will help, but the fact remains that nonliteral forms of speech are often enmeshed in complex ways (e.g., Kreuz, Roberts, Johnson, & Bertus, 1996). It's entirely possible to speak in an exaggerated way in order to be sarcastic, but also to be facetious or to tease someone else. A repetition can be an ironic echo, but it can also function as agreement or a request for clarification. Even something as basic as the relationship between laughter and humor is fraught: the two tend to co-occur, but laughter doesn't always signal humor, and humor need not be accompanied by laughter (Colston, 2015; Gibbs & Colston, 2012). Although it may be possible to draw distinctions between some nonliteral forms, such as irony and metaphor (Colston & Gibbs, 2002a), cutting the language pie into increasingly smaller slices may not ultimately be the best path forward.

In a similar way, attempts to identify additional discourse goals for verbal irony may not be particularly informative. In addition to all the uses mentioned earlier, verbal irony can be employed to express emotional and cognitive states as diverse as surprise (Colston & Keller, 1998), annoyance (Dews & Winner, 1995), affection (Jorgensen, 1996), and social solidarity (Ducharme, 1994). In short, verbal irony could be employed to express virtually any type of message: if the context is sufficiently supportive and constrained, it may be possible to be ironic with virtually anyone about anything. Therefore, it may be more informative to examine the use of irony in contextually impoverished conditions, as in CMC and social media, in order to identify the bare minimum that is necessary to trigger a nonliteral interpretation. In addition, a careful examination of both successes and

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failures in ironic communication should lead to a greater understanding of this form of language. Verbal irony may be a chameleon, but a close study of it in the wild – in talk, in print, and online – will provide a better understanding of how to be a skillful ironist.

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SECTION 3

Empirical and analytical studies aimed at specific applications

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Generating metaphors in product design

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A product metaphor mediates between the experience process of a user and the generation process of a designer. A user goes through the stages of perceiving that a metaphor has been employed in a product, recognizing its target and source, comprehending why these particular entities are brought together, and appreciating (or not) this association. A designer has a particular intention to attain through the product (i.e., target) and comes up with a meaning to convey accordingly, finds a source that can assign this meaning to the product, and creates a mapping from this source to the product. In this chapter, we will first present a basic framework for metaphoric communication and proceed by elaborating on the designer side of the model. We will address each step through presenting our own research findings and/or analyzing current product metaphors in the market, and transform the framework into a detailed metaphoric communication model. We will end the chapter by discussing the model in a broader context of metaphor generation process and give metaphor producers a summary of considerations on creating more effective and aesthetic metaphors.

Keywords: product metaphor, metaphor generation, metaphoric communication, product design, association, mapping, metaphor quality, metaphor aesthetics

A chronic disease is hard for everyone, especially for children. Arthritis is one of such diseases that is typically thought to affect older people, but even small children can suffer from this incapacitating condition. The only remedy is consistent and repetitive exercises that can be painful, frustrating and boring for the children. Furthermore, most exercise equipment tools in the market are intimidating and made for the adult hands (Figure 1a). That is why Monstas interactive exercise toy was designed (Figure 1b). It is a set of "toy monsters" that are coupled with a tablet game, where the children move the monsters to overcome certain obstacles in the game while strengthening the most affected joints of their hands. The product is not only appealing and fun, but it was also proven to motivate children stick to their regimen of daily exercises and eventually push arthritis into remission.

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(a) (b)

Figure 1. (a) An example of hand arthritis exercise equipment, (b) Monstas interactive exercise toy for juvenile arthritis (designed by Shirley Rodriquez)

In this example, the designer employs a *product metaphor.* By designing a hand exercise equipment tool so as to elicit the experience of a different entity, i.e., toy monsters, she improves the functioning of the product and imparts an aesthetically pleasing quality to it. In the design practice, metaphors are frequently and intentionally employed for these purposes, however in design research, only a few scholars proposed structured means to investigate metaphors (Cupchik, 2003; Forceville, Hekkert & Tan, 2006; Hekkert, 2006; Hekkert & Cila, 2015; Hey et al., 2008; Kolb et al., 2008; Krippendorff & Butter, 2008; Van Rompay, 2008).[1] Yet, none of these studies provides a thorough analysis that involves a product metaphor's characteristics and the peculiar type of thought process that generates it. Metaphor generation is relatively overlooked compared to metaphor understanding and appreciation, though there has been substantial work on generation in, for instance, the study of creativity (e.g., Lubart & Getz, 1997; Silvia & Beaty, 2012). This comparative inattention is even more problematic for the design domain since

1. There is considerable work in the design literature regarding the use of metaphorical thinking in the design process as a method or tool to frame and solve design problems in a creative manner (e.g., Casakin, 2011; Hey, Linsey, Agogino & Wood, 2008; Madsen, 1994; Schön, 1979). This use of metaphors typically involves seeing a design problem from a new angle, e.g., "What if we conceptualize the internal mechanism of this cooling unit as a termite mound? Would it bring new insights to solve the problem of ventilation?", which is very valuable in practical problem solving. However, here the metaphor is employed as more of a way of thinking rather than it is a property of the end product, i.e., the inspiration taken from the ventilation mechanism of a termite mound may be invisible to the end user when they see the cooling unit. In this chapter, we focus on the use of metaphors where designers deliberately make associations between a product and a distinct entity in order to express particular functional, symbolic and/or ideological messages to users, and these associations are visible in the appearance and/or the use of the end product.

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metaphors are one of the powerful means in a designer's toolbox to communicate meanings to users through a product, and therefore, investigating which decisions that are taken when generating metaphors lead to more effective and aesthetically pleasing metaphors is crucial for creating products that make everyday life easier and make a meaningful contribution to it.

Prompted by this gap, we aim to present a framework of product metaphor generation in this chapter, where we tap into the processes underlying and the success of the decisions taken in this process. After examining the characteristics of product metaphors in the next section, we shift to describe a basic framework for metaphoric communication between a designer and a user. In Section 3, we focus our attention on the metaphor generation process and expand the framework by addressing each step in detail. Section 4 contains a discussion of the framework in relation to a broader context of metaphor generation processes, which is followed by a summary of considerations on creating more effective and aesthetic metaphors.

1. What is a product metaphor?

Similar to a verbal metaphor, a product metaphor consists of an association between a target and a source. Traditionally, the target is defined as the subject of the metaphor that is being described through the metaphor, and the source is the entity whose structure and logic is used to reason and talk about the target. In product metaphors, the *target* is the "product" that is being designed (the terms "target" and "product" will be used interchangeably throughout the chapter), and the *source* is the thing whose properties are borrowed in the metaphor. Therefore, the hand exercise equipment tool in the opening example is the target of this metaphor and the toy monster is the source.

Designers shape the target in such a way that it evokes the experience of the source without violating the identity of the target (Forceville, 2008). Different from a verbal metaphor, however, and in common with other visual metaphors such as in advertisements, product metaphors are captured in one image or visual manifestation. This process is called *mapping*, where a designer physically applies the metaphor by projecting relevant physical properties of the source onto compatible properties of target (the terms "mapping" and "applying the metaphor" will be used interchangeably throughout the chapter). In every metaphor, there is at least one property from the source that is transferred to the target. These properties in the Monstas are the playful cartoonish figures and the friendly faces of monsters. The form of a hand exercise equipment tool and a toy monster were merged into one coherent product by mapping the physical properties of the latter onto the former, and this mapping makes the end product become a visual fusion of these two separate entities.

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In relation to the verbal metaphors, the term mapping is used for referring to the transfer of source properties to target, but at a conceptual level (Gentner, 1989; Lakoff & Johnson, 1980; Strack, 2016). Kövecses (2010), for example, defines mapping as "a set of systematic correspondences between the source and the target in the sense that constituent conceptual elements of B correspond to constituent elements of A" (p. 7). Since a verbal metaphor associates two concepts by purely linguistic means (e.g., "Every child is a snowflake"), clearly we cannot talk about a physical transfer from source to target. Mapping here refers to establishing conceptual correspondence between these words, i.e., every child is unique, delicate, and precious as a snowflake. Products are, however, tangible things. In order to construe a product metaphor, designers are required to make the source visible in the appearance of the target. For this reason, product metaphors involve two distinct kinds of mapping: a conceptual mapping as in verbal metaphors to build the metaphorical link between a target and a source, and a physical mapping to manifest this link in a tangible form. When the designer of the Monstas decided to associate the arthritis equipment with toy monsters in order to make exercising more fun and engaging, it involved a conceptual mapping between these entities; whereas, the way she shaped the equipment in the form of monsters involved a physical mapping. We will use the term "metaphorical association" to address conceptual mapping in this chapter, and the term "mapping" will be reserved to address the physical transfer of source properties onto target.[2]

We should note that being composed of a target, a source, and a mapping in between is not sufficient for a product to be construed as a metaphor. Product metaphors are employed by designers to convey particular meanings and elicit cognitive or emotive effects in users (Cupchik, 2003; Forceville et al., 2006; Hekkert & Cila, 2015; Krippendorff & Butter, 2008; Van Rompay, 2008). Therefore, the association of two entities must say something meaningful and new about the product; otherwise the construction is simply juxtaposition, and not a metaphor. When a USB stick is shaped like a bagel or a mug is given the form of a swan, their appearances lose their connection to the use and meaning of these products. There

2. The label "metaphorical association" could also refer to what Fauconnier and Turner (1998; 2002) have long treated as a case of blending or conceptual integration, which does require the projection and transfer of conceptual structure from different but related input spaces. We use the concepts of "projection" and "transfer" in this article to refer to the "physical" means to manifest the conceptual integration in a tangible form, e.g., in the form, smell, or sound of the target. This is not to misalign our work with the previous research into metaphor and cognition, but is for differentiating the physical dimension of product metaphors from their verbal counterparts. Therefore, the word mapping is only used for denoting the operation of projection or transfer, not just alluding to correspondences or the noticing of correspondences.

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exists a physical mapping, but not a meaningful metaphorical association between the two. In a product metaphor, however, an apt association and an identifiable mapping must be achieved.

In some situations the identification of the target and the source may render answering the "when is a metaphor?" question difficult. For instance, Figure 2 depicts a product called Homo Sapien[3] that references the ultimate Stone Age tool, a simple rock (i.e., the source). However, it is not easy to indicate what the target is in this example. This product can be used for many purposes, such as sharpening knives, grating garlic, grinding spices, cracking nuts, tenderizing meat, and so on. Thus, it is unclear if the target here is a sharpening stone, a garlic-chopper, a grinder, or a nutcracker. It may well be that a combination of these products is the target. Being unable to identify the target is especially the case with new product categories. When the first e-book reader was launched, its appearance was an imitation of a real book with a similar size and an actual cover in order to help users to grasp the function of this new type of product. A book is the source in this example, yet how to name the target is a challenging question. It is a product category that did not exist before.

In some product metaphors, on the contrary, naming the source can be tricky. When a car model imitates the sleek figure of a hunter animal to ascribe a degree of aggressiveness to the car or use the grille in front as an abstraction of bared teeth, the designer does not explicitly refer to a particular aggressive thing like a lion, a shark or a wolf. Like the target in the Homo Sapien could be a combination of different kitchen utensils, the source in this metaphor may well be the general category of "dangerous animals".

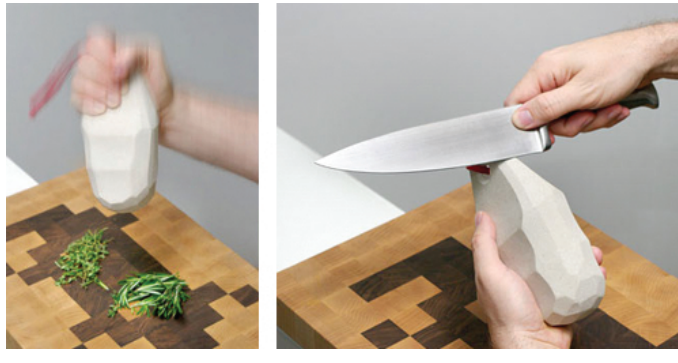


Figure 2. Homo Sapien multi-tool (designed by Marie Garnier)

3. The spelling of the product name is correct: Homo Sapien, and not Homo Sapiens (it could be a wordplay that the authors are missing).

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In the examples given so far, we can identify an association between a source and a target, yet we cannot name what they stand for precisely. In some products, however, we can clearly name these entities but it is not clear which one of them is the target and which one is the source. For example, Figure 3 presents a product that is a hybrid of a tie and a USB stick, which is intended for rendering data sharing quick and easy in a business environment. But is this a tie that references a USB stick or a USB stick that references a tie? We would not be sure, but can only speculate that the manufacturer or brand of the product may determine this. Since the target is derived from a product's main function, we can consider the target as the USB stick if the producer of this hybrid product is an IT company, or it can be the tie if a fashion designer produces it. Therefore, the target is context-dependent in some cases.



Figure 3. Business class (designed by dialog05)

All these examples hinder differentiating the domains of a metaphor, yet in our view they are still product metaphors. We suggest a broad and flexible definition of a product metaphor for this reason: As long as a designer or a user (or both) maps conceptual structure from a source to a target, those are instantiations of product metaphors.[4] We thereby exclude intentionality from the definition because

4. This loose definition of a metaphor may cause other tropes to be considered as metaphors in this chapter. Although Lakoff and Johnson (1980) maintained that the term metaphor also holds for other rhetorical figures of speech such as metonymy, paradox, paronomasia, and irony, the scholars who are more inclined towards a fine-grained analysis may not find some

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designers may use metaphors without deliberation and users can extract unintended metaphors from products, as we will discuss in the next section.

2. Metaphoric communication in product design

In design literature, there is a long-established tradition of referring to design as a process of communication between the designer and the user, and products as signs for interpretation (see for a review of communication models, Crilly, Good, Matravers & Clarkson, 2008). Designers intend to convey messages through the product by choosing and combining certain product features. At a basic level, these messages are based on functionality and usability, whilst more complex messages have to do with the values and associations they aim to evoke through the product. Users – a term that does not only refer to those involved in the purchase of a product, but also to include those involved in any kind of interaction with it, e.g. seeing, operating, playing with it – construct interpretations of the product by combining product features with their personal standards, expectations, and previous experiences. The interpretations then lead to judgments about the appeal of the product (i.e., aesthetic appreciation), emotional consequences (e.g., interest, frustration) and certain behaviors (e.g., approach or avoidance, purchase, increased usage). Designers are also aware that users attach meanings to products, and therefore, intend to create products that will be interpreted in certain ways. Therefore, there is an exchange between the expressive intent of the designers and interpretative response of the users.

Metaphoric communication can also be represented in this manner since metaphors are never merely inherent in products but created together by designers and users (Cupchik, 2003). Designers shape the product metaphor to evoke the experience that they intend with an anticipation of how the user would respond to the metaphor. Their expertise, experience, beliefs, motivations, capabilities and culture have a significant effect on this process. Users also have such background characteristics to interpret the metaphor that the designer generated, which often have theoretical and practical implications on metaphor comprehension (Blasko, 1999; Pierce & Chiappe, 2009).

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of the examples used in the chapter metaphoric. For instance, the Anna G corkscrew seen in Figure 4 can also be considered as a metonymy since the "saintliness" of the product was represented by its components, such as the glory and the arms (an indexical representation in Peircian terms). The same broadness can also be seen in the work of Kennedy (1982) and Johns (1984) who used the word metaphor virtually synonymous with the word "trope" in the context of advertising (Forceville, 1996).

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Several authors have pointed out that metaphor comprehension requires identification of the communicative and aesthetic goals the metaphor producer had in making the association (Cupchik, 2003; Gibbs, Kushner & Mills, 1991). Therefore, users have a "conception of the designer" meaning that they are aware that the designer may have intended to convey certain messages through the metaphor. In this process, users first identify the source through the references the designer has taken from the source during the mapping (Chiappe & Chiappe, 2007). If these properties are readily accessible and substantially pertinent, the metaphor is judged to be comprehensible and apt (Chiappe, Kennedy & Chiappe, 2003). Therefore, the experience of product metaphors on the user side goes through the temporal stages of: perception of the metaphor, recognition of the source and the target, comprehension of the metaphoric association, and appreciation of the metaphor (Cupchik, 2003). The first three stages involve making sense of the metaphor, whereas the last stage involves making an aesthetic judgment about its quality. For a coherent metaphor experience, a user needs to go through all these stages.

The metaphor experience may evolve through time as users interact with the product. Markussen, Özcan and Cila (2012) used the example of the Anna G corkscrew to explain this situation: The visual form of the Anna G evokes associations to a holy, almost saint-like female figure with a glory surrounding her head, a humble smile, and arms in a position similar to those of praying figures found in Catholic visual culture (Figure 4). When the corkscrew is not simply looked at but used for opening a bottle of wine, however, the user is cued to construct a counter-image. The cork is hidden under the skirts of the female figure and the user needs to look up under to skirts to remove it. This second meaning is also motivated by the product's name – Anna G – which could allude to a name that a stripper takes on when performing in a nightclub. Therefore, the experience of the corkscrew changes from the initial product perception ("she is a saint") to the final interpretation ("she is a stripper") after using the product.

Furthermore, the experience of a metaphor may also disappear during the course of time. There is a life cycle of a metaphor (Bowdle & Gentner, 2005; Fraser, 1979; Searle, 1979), in which the metaphorical power of a product wears out through frequent encounters; the metaphor becomes an integral part of the user's knowledge structure and gradually gets disconnected from its source. This is the case with our interaction with computers, in which most of us assume that throwing files into a trash bin to delete them or putting files into folders to categorize are "natural" ways of using computers, but in fact these metaphorical interactions are one of the possible (and the most successful so far) forms of finding our way in the abstract and complex world of computers.

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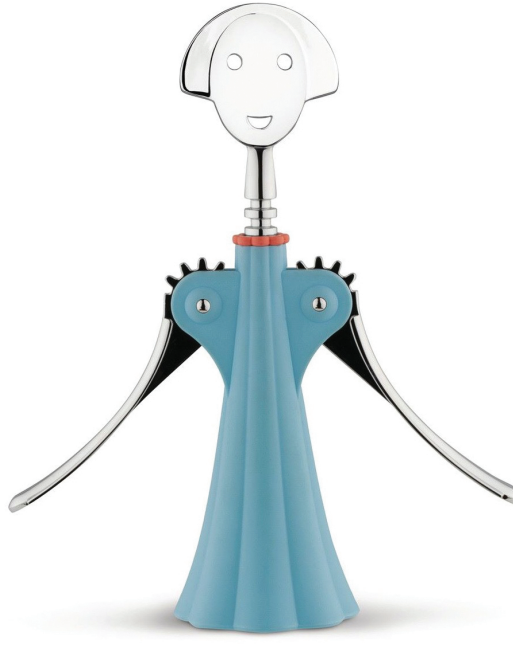


Figure 4. The Anna G corkscrew

In an ideal metaphoric communication, the designers realize their particular intentions through the use of a metaphor and the users discern the metaphor as it was intended. There may be, however, some miscommunication situations that hinder the effectiveness of this meaning exchange. First, users may miss the metaphor that the designer intended. Failing to give perceivable cues to users to identify the metaphor obstructs the metaphoric communication. An example could be the St. Peter squeezer (Figure 5). The gold-plated lemon squeezer reproduces the shape of the Saint Peter Square in Vatican in order to critique "the squeeze that Catholic Church makes on the Italian people through the 8% tax" (Iacchetti, 2007). Without reading the designer's statement, this association is not possible to be derived from the appearance of the product.[5] This is an issue that designers can overcome by choosing a more explicit mapping strategy, which we will be discussing in the next section under "Mapping".

5. We could imagine that the reference to the Vatican (through the activation of a metonymic association – St. Peter's Square stands for the power of Vatican) might be readily accessible to Italians. This is a good example of the dominant role that cultural knowledge plays in metaphorical representation.

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Figure 5. St. Peter squeezer (designed by Giulio Iacchetti)

Second, users may misinterpret the actual intention of a designer. Interpretation cannot be reliably controlled because different people will construct different meanings depending on factors such as context, motivation and values (Crilly, Maier & Clarkson, 2008). Whenever a designer presents a metaphor, s/he takes the risk that the inferences drawn may not be the ones that were intended. In other words, like any kind of metaphor, product metaphors are also faced with the problem of plurality of readings. This is the case with the aforementioned Anna G corkscrew in which the intended reference to the famous designer Mendini's good friend (Kamp, 2016) was read as referencing to a saint or a stripper (Markussen et al., 2012).

Third, users may construe an "unintended" metaphor. In certain situations, users are capable of eliciting metaphors from products that were not envisaged by their designers to be experienced as metaphors. Many years ago, the second author was interviewed by a Dutch newspaper about the immense success of the Philips Senseo coffee maker. In addition to the then groundbreaking technology of producing just one or two cups of coffee by easily inserting pods, he stated that the success of the product could also have to do with its singular shape: it aptly alludes to a servant because its curved outline makes the coffee maker look like it is courteously bowing to offer a cup of coffee to the user (Figure 6). After the publication of the interview, he was contacted by the designer stating that it was never his intention to employ this metaphor; the form of the product was a result of a

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technical necessity to pump the heated water up the coffee maker. Still, the servant metaphor perfectly fits the context, use and meaning of a coffee maker – it is a product to serve coffee – and ascribes the product a deeper meaning that changes its experience as a whole.



Figure 6. Senseo coffee maker by Philips

Even if a user (1) does not recognize the metaphor intended by the designer, (2) elicits an interpretation that is different from the designer's intention, or (3) discerns a metaphor from the product which was not intended, we consider all these examples as instantiations of a metaphor. These miscommunication situations, however, make us to ponder on the "quality" of such metaphors. If the users cannot recognize the metaphor does this metaphor achieve its communication purposes? Or if different users derive different interpretations from a product, to what extent this is an effective metaphor? Especially as we are interested in the generation of metaphors, these miscommunication scenarios are worthy of studying to indicate how designers can take safe (in terms of communicating their intended message) yet interesting decisions when creating new metaphors. We will be discussing these decisions in the next sections.

Turning to the generation side of the metaphoric communication, the current understanding of verbal metaphor generation suggests that when people generate

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a metaphor they have a meaning in mind that they want to attribute to the target and look for a source that is a salient exemplar of that meaning (Chiappe & Chiappe, 2007; Clevenger & Edwards, 1988; Jones & McCoy, 1992; Pierce & Chiappe, 2009). Similarly in product metaphors, the generation process starts with deciding which particular quality of the product to emphasize (i.e., the meaning to convey) and for what reasons (i.e., the intention to use a metaphor), and then seeking out a relevant source. Going through these stages, a metaphorical association is built. The designer then conducts a mapping from the source to the target (i.e., metaphor application). In this process some external factors also play a role, such as the production and cost constraints, regulations, and brand requirements (Bloch, 1995). The designer's task can be seen as the planning of forms that appropriately reconcile many competing and conflicting factors (Crilly, Moultrie & Clarkson, 2008). Below, we will elaborate on each step of this process and at the end of the chapter present a detailed framework bringing together all the decisions that need to be considered when generating product metaphors.

3. Product metaphor generation

3.1 The intention to use a metaphor

Designers hold intentions for what kind of experience to provide users with through the product and they construct forms that are expected to evoke those experiences (Crilly, Moultrie & Clarkson, 2008). Hassenzahl (2003) defined two main attributes of products that need to be designed: Pragmatic attributes refer to the practical aspects of the product that support efficiency and effectiveness in usage, while hedonic attributes provide stimulation of the senses, expression of identity and evocation of memories and feelings for the users. A similar distinction can also be made concerning the use of product metaphors. First, if the quality that a designer intends to emphasize through the metaphor is related to the pragmatic attributes of the product, we call this use of metaphors a designer's *pragmatic intention*. These intentions have to do with reducing the cognitive workload of users when interacting with the product by (1) encouraging identification of the product category and type, and (2) supporting comprehension of how the product is used or operated. An example could be the previously mentioned e-book reader, which imitates the look and feel of an actual book. An e-book reader is just a display that can take any form, yet shaping it to reference a book practically communicates that this is a product that you can read from and help users identify the product category.

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Second, a designer may intend to focus on the hedonic attributes of a product and provide users with an aesthetic, social, sensorial or emotional experience, which we label as an *experiential intention*. This can be attained by (1) assigning a symbolic meaning to the product to provide a pleasurable interaction, (2) promoting an ideology, such as conveying a moral, societal, political message, or (3) evoking amusement and surprise by creating a witty product. The intention in Monstas (Figure 1b), Homo Sapien (Figure 2), Business class (Figure 3) or Senseo (Figure 6) is experiential in our categorization, especially since the main aim of their designers is to provide a novel and engaging experience to the people while using these products.

We have discussed and exemplified these intentions in detail elsewhere (Cila, Hekkert & Visch, 2014b; Hekkert & Cila, 2015), but here we should note that having a pragmatic intention does not necessarily mean that a designer does not take the experiential aspects of the product into account, and vice versa. When designing the first e-book reader for instance, the designer most likely considered the ways to make the product pleasant to use, or the designer of the Monstas carefully planned if the playful interaction with the toy monsters makes the children follow the exercises that are necessary for the remission of juvenile arthritis. There are certain requirements of these products that motivate the intentions that are held, and some intentions will predominate over the others (Crilly, Moultrie & Clarkson, 2008). For this reason, designers are generally required to prioritize their intentions.

3.2 The meaning to convey

We can consider the metaphoric intention as the end effect a designer aims to evoke, i.e., why s/he chooses to use a metaphor. To achieve this effect, s/he needs to frame which qualities of the product to emphasize and ascribe a "meaning" to the target by associating it with a source that can bring out those qualities. If we have a look at the Bzzz flyswatter in Figure 7a for example, the designer has an experiential intention to evoke amusement and surprise. He attains this goal by revealing one of a flyswatter's hidden qualities: to make "things" disappear with one flick of the wrist. The same experiential intention also exists in the design of the FlyFlap in Figure 7b, but in this case the designer emphasizes the relation of a flyswatter with a fly by shaping the product as the wing of a fly. Each metaphor in Figure 7 ascribes a different meaning to the target even though they are the same product type and created with the same intention of evoking amusement. Therefore, the meaning conveyed through the metaphor involves the inherent qualities of the target that the designer wants to bring to attention.

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(a) (b)

Figure 7. (a) Bzzz flyswatter (a deep metaphor), (b) FlyFlap designed by Ramon Middelkoop (a surface metaphor)

3.2.1 *Surface vs. Deep meaning*

Making things disappear is a quality intrinsic to magic wands but is new and witty (yet apt) for flyswatters. When a metaphor unearths such non-salient qualities of a target, we term it a "deep metaphor". Conversely, when the salient and defining qualities of a target are highlighted, we term it a "surface metaphor". Here the metaphor pertains to an aspect that is obvious and commonly known about the target. The use of the term *depth of a metaphor* (from surface to deep) is itself metaphorical: We use it to define the extent to which the quality highlighted by the metaphor is salient for the target (Cila, Hekkert & Visch, 2014b). This definition is essentially in line with the term "aptness" used in relation to verbal metaphors for addressing the extent to which the source's meaning expresses an important quality of the target (Jones & Estes, 2006; Pierce & Chiappe, 2008). We maintain that both surface and deep metaphors can be highly apt, as a particular source is associated with a target on the basis of the target quality to emphasize (Glucksberg & Haught, 2006) and this quality can be salient or non-salient for that target. Their difference, however, comes from the "ease" with which a designer finds a quality to highlight. In general, highly salient and visible features of things are accessed more easily than non-salient ones (Christensen & Schunn, 2007). When users encounter a surface metaphor, it is easy for them to see the relationship between the target and the source (e.g., flyswatters swat flies, and therefore, this flyswatter is shaped like a fly's wing), and instantly understand the meaning that is conveyed. On the other hand, it is relatively more difficult for the user to travel the distance between a magic wand and a flyswatter. Although a salient quality of the magic wand was mapped in this deep metaphor, this is a non-salient quality for a flyswatter. This requires users to ponder the reasons why these two entities are brought together. The same applies to the designer side as well: a designer needs to dig into the target's qualities to uncover an interesting dimension to highlight.

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This situation implies that the creation of deep metaphors is a more sophisticated way of building associations. The metaphors that focus on a less obvious quality of the target are better than ones that highlight an obvious quality that can be readily ascertained. By using a large set of product metaphors to investigate people's aesthetic preference, Cila, Borsboom, and Hekkert (2014) demonstrated that the aesthetic quality of a metaphor is greatly affected by the novelty of a target–source association, which is based on bringing a surprising, hidden dimension of the target to light by associating it with a source that does not have an obvious relationship to the target (see Section 3.3.3). This is precisely what deep metaphors accomplish.

However, this does not mean that surface metaphors are of no value. We have found out that designers knowingly revolve around a particular level of metaphor depth depending on the communication intentions they have (Cila, Hekkert & Visch, 2014b). Having pragmatic intentions lead the designers to focus on a salient quality of the target and select an obvious source accordingly in order to provide an easy and accessible communication with the user, while experiential intentions lead designers to dig around their minds to promote non-salient qualities of the target and uncover original sources. The reason is related to the nature of the metaphoric communication mentioned before. Designers aim for the best match between their intention and the possible user interpretation when it comes to expressing what the product does and how it works, because a mismatch regarding these functional aspects may cause the product to fail, or in the worst case, put the user in danger. Having a pragmatic intention implicitly guides designers to express the function of the target as clearly and effectively as possible, and this is facilitated by associating it with a source whose selection the user can easily deduce. The risk of this type of failure is diminished when designers prioritize experiential goals. In order to attain exciting, interesting, or surprising metaphors, designers need to be bold and creative in finding novel associations. Thus, experiential intentions allow designers to look for meanings that are more difficult to come up with, and as a result, employ sources that do not have an obvious relationship with the target. Compared to pragmatic intentions, it is less important if the meaning is unclear to the user.

3.2.2 *Embodied vs. Learned meaning*

Hurtienne and Blessing (2007) classify the origins of knowledge into four levels: The first and the lowest level is the unconscious and universal innate knowledge that we acquire during the prenatal stage of development. The next level is sensorimotor knowledge, which is acquired (partially) in the womb and very early in childhood through interaction with the world. This level is followed by the

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knowledge specific to the culture one lives in. Finally, the highest level of knowledge is expertise, namely the specialist knowledge acquired in one's profession.

The meaning conveyed through a metaphor can be based on these four knowledge levels: When a target-source association is built upon innate or sensorimotor knowledge, the emerging metaphor is an embodied metaphor; when it is based on cultural knowledge or expertise, the metaphor is a learned metaphor ("cultural metaphor" in Forceville et al., 2006). We can consider Monstas (Figure 1b) as an embodied metaphor because the product appeals to our evolutionary and universal positive reactions towards infant-like physical traits, which actually creates the pleasurable experience provided when interacting with this product. As humans, we characterize friendliness and cuteness via round and softer body features, large eyes and head (Lorenz, 1950). By shaping the product according to these traits, the designer triggers a mental schema that classifies our sensorimotor experiences of cuteness. Van Rompay, Hekkert and Müller (2005) showed that our embodied image schemas could predict the understanding of abstract product characteristics, such as trustworthiness, dominance, restlessness, and so forth. For instance, jugs that provide higher degrees of closure of their contents are perceived as more secure or taller jugs are evaluated as more dominant since humans have innate image schemas to associate containment with safety and height with dominance.

Other metaphor examples we provided so far can be classified as learned metaphors. In order to generate and make sense of them, one should know what life was like during the Stone Age (Figure 2) or what a magic wand does (Figure 7a). Provided by our awareness of these cultural meanings, these metaphors become identifiable and powerful, otherwise they would not achieve their communicative purposes. If the user does not possess the cultural or expertise knowledge that is required to comprehend the metaphor, the metaphoric communication fails in these cases.[6]

3.3 The source to associate

After designers clarify their intentions to use the metaphor and the meaning they would convey, they look for an entity that embodies this meaning. An appropriate and aesthetically pleasing metaphor demands a careful selection of the source. Below we would like to elaborate on the characteristics of a "good source".

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6. Although we deliberately took a straightforward approach to define the categories that are involved in a metaphor and therefore made distinctions between embodied metaphor and learned metaphor, Conceptual Metaphor Theory points more to an interaction between the embodied aspect of metaphorical conceptualization (i.e., universal, primary, or common) and variation stemming from cultural context. In other words, a metaphorical mapping will most often involve both.

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3.3.1 *Salience*

Designers aim to emphasize the meaning they intend to convey as clearly as possible. For this reason, they narrow down the number of potential sources by focusing on those that are "an ideal and salient exemplar of the category it represents" (Glucksberg & Haught, 2006, p. 375). Salience refers to the extent to which the meaning a metaphor producer wants to convey is a prominent and distinctive attribute of a particular source (Katz, 1982; Ortony, Vondruska, Foss, & Jones, 1985). For instance in the toilet brush seen in Figure 8, the designer aims to convey the meaning that users actually "fight" with dirt when cleaning their toilets. Being used in fighting is a hidden quality for a toilet brush, but a salient property for the source he chose, the Excalibur. Salience refers to how central and prominent this property is for a sword, relative to other aspects of a sword. Although other entities like a dog or a pepper spray also embody a relationship with fighting, they would



Figure 8. Excalibur toilet brush (design by Philippe Starck for Alessi)

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not convey the intended message of the designer very accurately. The reason is that fighting is not a particularly salient property of these entities; they both have other properties more salient than being involved in fighting.

We have found out in various design exercises conducted with designers that they prefer to employ sources that have the meaning they aim to convey as a salient property in order to assign that meaning to the target unambiguously (Cila, Hekkert & Visch, 2014a; Cila, Hekkert & Visch, 2010). Through association, the target automatically inherits the meaning that the source saliently embodies, and the product quality that the designer intends to highlight is eventually addressed.

3.3.2 *Mappability*

With regard to the verbal metaphors, it is forfeited by Lakoff (1993) that the metaphorical mapping of meaning structures from source to target cannot take place unless there is a structural isomorphy between source and target – also known as the Invariance Principle (see Ruiz de Mendosa [this chapter] for an extensive discussion on this principle and one of its developments, called the Extended Invariance Principle). In other words, the target sets constraints on the nature of the source. This principle is related to the product metaphors in a slightly different manner: the target indicates if the "physical" properties of the source can be projected to the target's corresponding properties (as opposed to the conceptual mapping of source elements). As part of the responsibility of a designer is to create functioning, efficient, and pleasurable products, it is important for them to consider whether the association they intend to make with a distant entity would fit the inherent constraints present in the product and the design brief, such as working mechanism, product category, and product character. They are therefore compelled to select sources that will not physically interfere with the use and character of the target product.

The degree to which a source's properties can be successfully transferred to the target we have described as its "mappability", which is one of the constraints that limit the freedom of a designer when selecting a source (Cila, Hekkert & Visch, 2014a; Cila, Hekkert & Visch, 2010). When a target and a source carry corresponding properties, the source becomes more mappable as it is relatively easier to transfer its relevant properties to the target. For example in the Excalibur, there is an inherent similarity between a toilet brush and a sword provided by their elongated form and the way they are typically held. Compared to a fist or a gun, which could also be salient source examples for the meaning "fighting", a sword is a more mappable source in this context because it is easier to create a new form that still looks and feels like a standard toilet brush when referencing a sword.

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Mappability makes some sources preferable over other possible sources that do not possess an inherent physical similarity with the target.

3.3.3 *Novelty*

Richard (1965) considers a metaphor to involve a "tension" between target and source since they are normally disparate entities and their differences create a puzzle to solve. This incongruity induces arousal by stimulating the sense organs (Anderson, 1964). Once a metaphorical idea is understood and the similarities between a target and a source are identified, the negative tension in the metaphor is relieved. This is why resolving a metaphor is found aesthetically pleasurable (Ramachandran & Hirstein, 1999; Sopory & Dillard, 2002).

In order to create this arousal, the target-source association needs to be perceived as unfamiliar, unexpected, and novel by the metaphor's recipient. Novelty provides a conceptual puzzle to solve, and therefore, one of the key factors affecting the attractiveness of a metaphor. We consider that associating a sword with a toilet brush is a novel idea. The designer made a break with the expected form of a toilet brush by emphasizing a hidden dimension of it. Moreover, the pragmatic and everyday toilet brush usually does not come with metaphorical references. For these reasons, it is pleasurable to perceive this metaphor. Now let us imagine a different toilet brush that also references a tool, such as a hammer. This association would be uncommon and novel too, yet it would not be considered apt. A hammer does not have any obvious relationship with a toilet brush or the meaning that the designer intends to convey. This is why we cannot define source quality strictly in terms of novelty. The visual appeal of a product is also influenced by the extent to which it makes sense to the viewer (Crilly et al., 2004). Several studies have found that metaphoric quality is closely related to metaphoric comprehension (Blasko, 1999; Malgady & Johnson, 1976; Tourangeau & Sternberg, 1981). In sum, for a metaphorical association to be aesthetically appealing, the source has to be both novel and understandable.

We had found out that novelty and understandability are not independent for metaphoric quality (Cila, Borsboom & Hekkert, 2014). Highly novel metaphors may lack understandability and risk absurdity, whilst obvious metaphors lose their interestingness and power to surprise. Therefore, the aesthetic preference for metaphoric associations is determined by the joint influence of novelty and understandability.

3.4 Mapping

We mentioned in this chapter a couple of times that metaphor producers deliberately address a metaphor to the receiver to be interpreted in a particular

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way, namely they have "an intention that is intended to be recognized" (Gibbs et al., 1991, p. 15). To provide this recognition, the mapping phase is vital. After identifying a source that will emphasize the target's intended qualities, the designer needs to consider how to communicate this association to the user sensorially. In this mapping stage, the metaphor is physically applied by providing salient cues on the target to that effect: incorporating the source's specific details or overall impression into a newly reshaped target.

3.4.1 *Mapped properties*

In this stage, the term "salience" plays a role again. The designer projects salient properties of a source onto a target, namely its defining, prominent and characteristic properties. If one aims to make a metaphorical reference to the wing of a fly when designing a flyswatter for example, just coloring the flyswatter black would not suffice. For communicating the source unambiguously, a designer also needs to transfer typical properties of a wing, such as its prominent shape and/or vein patterns (Figure 7b). These salient properties differ for each source, but we can classify them under eight categories: form, interaction, material/ texture, movement, sound, taste/smell, name, or graphics (Hekkert & Cila, 2015). For example, in the Excalibur (Figure 8), the "form" of a sword and "the way one interacts with it" are mapped to the toilet brush. If someone misses to see the similarity of the brush to a sword just by looking at it, s/he might get the point by actually holding it and using it. Furthermore, the "name" of the source, i.e., Excalibur, is also mapped in order to help user to notice it. Here, there is an interplay between verbal and product metaphor (as also in the Monstas [Figure 1b] and Homo Sapien [Figure 2]).

3.4.2 *Mapping strategies*

The properties of the source can be projected to the target in different ways, which we term *mapping strategies*. We identify two groups of mapping strategies: The first group involves two strategies that differ in their *degree of abstraction of the source properties* – literal vs. abstract mapping. The abstraction can be kept at a minimum by transferring the source properties directly, which we entitle as "literal mapping" from source to target. If we have a look at the garlic press on Figure 9a, it evinces an obvious use of the garlic form, which has been transferred to the product in its entirety. The plastic press looks like an actual garlic head with the same shape, color and texture. On the other hand, in the garlic press in Figure 9b, the geometric essence of a garlic head was extracted; the bulb becomes an elegant glass vase to store garlic cloves and the sprout inspires the shape of the metal press. This exemplifies an "abstract mapping" where the designer simplified the appearance of the garlic bulb into an outline to create an attractive but still functional shape.

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(a) (b)

Figure 9. (a) The Garlic Chop by Koopeh Designers (a literal and source-driven mapping strategy), (b) Eva Solo by Jensen (an abstract and target-driven mapping strategy)

The mapping strategies adopted by designers of these two products also differ in another related yet distinct sense. This brings us to the second group of mapping strategies that differ in their *degree of maintaining the stereotypical visual identity of the target* – source-driven vs. target-driven mapping. A garlic press as a tool has a typical form: a two-handled device hinged together by a flat metal press on one side, and a bowl with a grid of small holes on the other. Because the designer of the press in Figure 9a directly replicated the shape of a head of garlic, the "typical garlic press identity" is compromised. The product resembles a garlic bulb more than it does a standard garlic press. This situation we term "source-driven mapping", where the focus of the designer is to emphasize the look and feel of the source. In Figure 9b, however, that identity has been maintained to some extent since the garlic bulb form has been adapted to the form and usage conventions of a standard garlic press. This type of mapping we label "target-driven mapping", where the focus of the designer is to maintain the product's identity.

One may naturally expect to have the outcome resemble the source more when conducting a literal mapping and have it resemble the target more after an abstract mapping, yet this does not need to be the case. Let us have a look at the two baby feeding bottles in Figure 10. The bottle shown in Figure 10a mimics the size and shape of a take-away paper coffee cup, a strategy intended to tap into the lifestyle of 21st century parents (Montgomery, 2013). The off-centered positioning of the teat and the size of the bottle are exact copies of a standard coffee cup (hence, this is a literal mapping). Still, the reference is so subtle that the product solidly projects its identity as a typical feeding bottle (i.e., a target-driven mapping). In the feeding bottle shown in Figure 10b, the designer used a mother's breast as the inspiration for the teat's shape, and made this the immediately discernible, main focus of the design (i.e., a source-driven mapping), yet abstracted the appearance of said source by using an outline barely reminiscent of a breast rather than copying the appearance directly (for example by excluding areola and making the shape more geometric).

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Figure 10. (a) Mothercare baby bottles designed by Daniel Weil (a literal and target-driven mapping strategy), (b) Mimijumi feeding bottles (an abstract and source-driven mapping strategy)

Regardless of which mapping strategy to follow, when a designer blends a source with a target, a playful puzzle is created for our brain to solve. In aesthetic experience, it is considered that discovering a property after an effort is paradoxically more pleasant than immediately recognizing it (Armstrong & Detweiler-Bedell, 2008; Ramachandran & Hirstein, 1999). Similarly, when applying a metaphor any reference to a source should be subtle enough to provide this visual puzzle to the recipient. This means that a designer needs to keep the properties that are borrowed from the source at a minimum and tailor these properties to blend with the product, i.e., follow an abstract and target-driven mapping strategy. That is why the Eva Solo garlic press (Figure 9b) is pleasurable to look at: the product includes typical garlic bulb properties, but these salient properties are abstracted and have become an essential part of the form of the garlic press. Still, missing this reference to a garlic bulb would be difficult because the source has been noticeably drawn to users' attention through the visual composition of the product. In sum, there is a subtlety in the reference to the source, yet the reference can still be identified.

We have shown that designers should keep the reference to a source subtle but to some extent noticeable in order to create effective and aesthetic metaphors (Cila, Borsboom & Hekkert, 2014). If identifiability overrides subtlety, the product metaphor might be too straightforward and even kitsch, as in the Garlic Chop (Figure 9a), whereas if subtlety overrides identifiability, the metaphor could be missed entirely, as in the Mothercare bottle (Figure 10a). Subtlety can be achieved by abstracting the essence of the source, eliminating all parts irrelevant to the context of a product, and blending its properties thoroughly with the target. By transferring only this essence to a target, a designer keeps the reference subtle – as many details of the source have been eliminated – yet identifiable, as the most prominent properties have been used.

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4. Notes on product metaphor generation

To address what makes for a product metaphor, we illustrate a final overview of metaphoric communication through products (Figure 11). A product metaphor mediates between the "metaphor experience process" of a user and the "metaphor generation process" of a designer. A user goes through the stages of perceiving that a metaphor has been employed in a product, recognizing its target and source, comprehending why these particular entities are brought together, and appreciating (or not) this association. A designer has a particular intention to attain through the target and accordingly comes up with a meaning to convey, finds a source that can assign this meaning to the product, and creates a mapping from this source to the target. These processes are also influenced by the background characteristics and capabilities of both parties, how they envision each other, and external context factors.

As can be seen in Figure 11, the intention of designers to employ a metaphor may be for pragmatic or experiential reasons. When unearthing a meaning to convey on the basis of this intention, they can either focus on more obvious meanings (i.e., surface metaphor) or hidden and unrevealed ones (i.e., deep metaphor). This meaning can also be based on our universal, innate knowledge (i.e., embodied metaphor) or on the knowledge we acquire through our life experiences (i.e., cultural metaphor). Designers are then required to come up with a source that can assign this meaning to the target they design through their association. For effective communication, this source needs to have the intended meaning as a salient property, be physically mappable and novel yet understandable. After finding a source, designers then turn this metaphorical idea into a physical reality via mapping. For this, they need to consider which properties of a source to project onto the product (e.g., form, interaction, material, sound, movement, smell, name, graphics) and how to conduct the mapping (e.g., literal or abstract, target-driven or source-driven).

Designers use metaphors for conveying any kind of instrumental or non-instrumental meanings through the product, but they can surely solve most design problems without resorting to a metaphor. Metaphor is an added value contributing to the effectiveness and pleasantness of a product. If we go back to the opening example of this chapter, Monstas, instead of using the toy monster reference to provide a game to children, the designer could have created a conventional hand exercise equipment but with a friendlier form, colors, and sounds for children. That way the product may have made a break with the intimidating image these products typically have and promote the children to exercise their hands more, yet it would have lost a considerable part of its originality, effectiveness and fun. When

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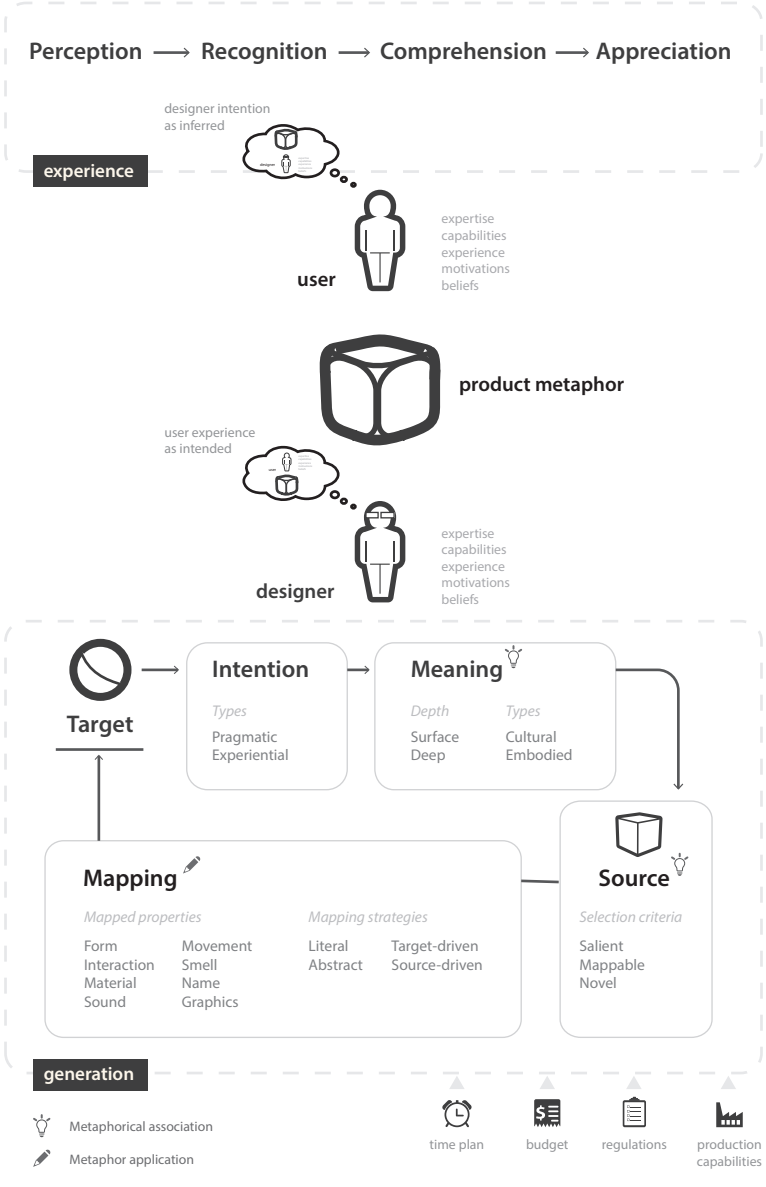


Figure 11. Final framework of metaphoric communication

giving tips to designers for creating pleasurable products, Djajadiningrat and his colleagues advised to keep away from metaphors and create products that have an identity of their own (Djajadiningrat, Overbeeke & Wensveen, 2000). We agree with the authors that the misuse or overuse of metaphors can create rather kitschy and unaesthetic products, however, we strongly advocate that their successful

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use enhances the whole product experience drastically. Metaphors are not simple stylistic devices of designers that are used for ornamenting a product, but quite the contrary, they are essential for communicating with users effectively. Throughout this chapter, we have tried to show that metaphorical thinking is fundamental to framing problems and forming concepts, and designers turn to metaphors frequently to strengthen their messages through the products.

The process we have modeled is also in line with the metaphor generation processes described by scholars from other creative disciplines. For example, Forceville (2008) described the stages that an advertiser goes through when creating a pictorial metaphor, which starts with defining the selling position. This is the attributes of the product or service to be emphasized and is similar to what we named as meaning attribution in product metaphor generation. This stage is followed by finding a source from which the desired attributes can be generated and creating a similarity between the product and the source. The advertiser then completes the generating process by choosing the modalities that the transferred features will be cued (ibid). Similarly, Do and Gross (1995) describe the inspiration seeking behavior of architects, where they start by thinking of forms that are linked through some concept about the design at hand, such as trying to come up with relevant and appropriate sources to shape a performing art center or a museum's form on the basis of its functional qualities. This is again in line with searching for a source with a meaning in mind. However, Do and Gross also present us with a note Le Corbusier wrote next to his sketches of Ronchamp chapel, which points at a different kind of process that designers may use when referencing a distinct entity: "the shell of a crab picked up on Long Island in 1946 is lying on my drawing board. It will become the roof of the chapel…" (Le Corbusier, 1957, p. 89; in Do & Gross, 1995).

To what extent designers deliberately seek solving their problems with metaphors is an interesting question. We consider that designers rarely sit at their desk with the explicit intention of using a metaphor, except when they look for an overarching marketing strategy or an advertising campaign that would shape all the designerly actions within a company (Nonaka & Takeuchi, 1995). Instead, the metaphor would come to them spontaneously when considering various other solutions. The process of Le Corbusier seems like a process in which the designer stumbled upon a metaphor by accident and incorporated the source into his emerging design spontaneously. We can speculate, however, having pragmatic intentions would steer a designer towards a more deliberate strategy to look for a metaphor than experiential intentions do. Going back to the e-book reader example created with the "product identification" intention for instance, we can say that its designers were deliberately trying to emphasize that this new product was meant for reading digital books. What else can be a better source than an actual

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book itself? But in some products, it is apparent that the meaning and the source emerged at the same time in a rather spontaneous way. In the Mothercare feeding bottle in Figure 10a for example, it is difficult to imagine that its designer started with a meaning to convey. It is more plausible that the designer who thought of shaping a baby bottle in the form of a Starbucks paper coffee cup would critique the current parenthood; the starting point was more on the association itself rather than the intention behind it.

Such spontaneous processes also abound in product design books. One of the most famous anecdote is from the acclaimed designer Philip Starck, who explained how the design of his iconic lemon squeezer Juicy Salif came about: "Once in a restaurant, this vision of a squid like lemon came upon me, so I started sketching it… and four years later it became quite famous" (Lloyd & Snelders, 2003, p. 240). Although Lloyd and Snelders ascribe this association to Starck's childhood memories and his early interest in Sci-Fi cartoons, the access to this metaphor is still rather instant and unplanned. It should be noted that this metaphor involves a conceptual mapping from a squid to a lemon squeezer, which is a defining characteristic of a product metaphor. The spontaneity of the association does not remove the meaningfulness and aptness of it. Such a non-sequential process is more difficult to investigate from a research point of-view as it is based on coincidence most of the time. Searching for a source based on a plan also involves inspiration or luck; however, the design problem at hand constrains the possible solutions. In the former, one starts from the immediate association and evaluates if this association is or can be made meaningful within the given context, whereas in the latter, one starts by building associations based on the end effect s/he wants to achieve. For this reason, we argue that the components mentioned in our metaphor generation model are still capable of capturing the main dimensions of a metaphor generation process for such spontaneous processes, yet they are not in the sequential order that applies to more deliberate search for metaphors.

5. Summary of considerations for better metaphors

The model in Figure 11 can help designers to better understand the complexity of product metaphor generation and provide them with insights that can support them in their work. Below we will condense our model into several considerations to create good metaphors. These are originally related to product metaphors, but many of the decisions they consider in this process – e.g., criteria for selecting a source, depth of the metaphor, novelty–understandability balance – can also be applied to the verbal metaphor generation process to describe how and why one comes up with a particular metaphor and explain the success of the created metaphor. The findings related to the application phase of metaphor generation would

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not apply to verbal metaphor generation obviously, yet it can provide insights for other kinds of nonverbal metaphor generation processes, especially for visual metaphors used in advertisement and graphic design. We will organize our recommendations according to the three main activities of metaphor generation: finding an idea, finding a source, and applying the metaphor.

Finding an idea

- Choose a hidden quality of the target to highlight: Original and clever metaphors typically highlight a hidden quality of a product. In order to find this hidden quality, a designer can try to make a break with the expected look, function, context, or meaning of the product by noting metaphors already implicit in the problem description.
- Keep in mind the intention to use a metaphor: The meanings that can be ascribed to a product can change according to the type of intention a designer has. When there is a pragmatic intention, it would be better to focus on a meaning that is on the surface; whereas, an experiential intention may require finding a deeper meaning to emphasize.

Finding an apt source

- Use a source that has the intended meaning as a salient property: This is for providing an unambiguous communication to the user. If a source does not convey the meaning effectively and has many other properties that are more salient than the meaning a designer intends to convey, the metaphor would cause confusion and misunderstanding for the user.
- Evaluate the mappability of a source: For the functioning of a product, it is important to consider whether the association a designer intends to make with a potential source would fit the inherent constraints present in the target product (e.g., align with working mechanisms, support product category identification, sustain the intended product character). For this reason, a designer needs to evaluate the applicability of a source, which would not interfere with the use and character of a target.
- Choose an association that is novel but understandable: In order to create excitement and interest in users, the metaphorical association needs to be perceived as unfamiliar, unexpected and novel, which provides a conceptual challenge to overcome. However, this association should also make sense to the user: Highly novel metaphors may lack understandability and risk absurdity. Therefore, a designer needs to balance the novelty and understandability of a target–source association.

Applying the metaphor

- Keep the reference to the source subtle but identifiable: In order to create attractive metaphors, the source needs to be concealed to some extent in order

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to provide an intriguing visual puzzle to solve. Still, this puzzle needs to be kept solvable by making the source emerge in the appearance of the target. When the source is not hidden, the metaphor would become too straightforward and obvious; whereas, when it is too hidden, the metaphor would not be recognized. Therefore, a designer needs to keep the balance between subtlety and identifiability.

- Match the inherent target properties: Metaphorical mappings should preserve the structure of the source in a way that is consistent with the inherent structure of the target. This means that designers are required to pay attention to the properties of the target, i.e., how a typical version of that product looks and feels like, what kind of components it has, how it is used, and so on. To obtain aesthetically pleasing metaphors, care must be given to match the source properties with the target properties; otherwise, the mapped properties may make the application of a metaphor to be seen as a gimmick instead of improving the functionality or enhancing the meaning of the product.
- Tailor the source properties to blend with target properties: A designer needs to blend the projected source properties with the target properties rather than forcing them onto the target too coarsely and explicitly.
- Always map salient properties of a source: The properties that are projected from a source needs to be functionally significant and/or perceptually characteristic in order to make the users recognize the source.
- Do not necessarily transfer "everything" from a source: It is a more convenient approach to keep the projected properties from a source onto a target at a minimum. When the properties that are irrelevant in the context of the target are transferred from the source, the product may lose its identity because these properties may interfere with the product's expected form, context and use. In general, a design is considered as more beautiful when a great effect is attained with only a minimum of means (Da Silva, Crilly & Hekkert, 2016).
- Consider all the modalities: There are eight different means that a designer can manipulate to convey a metaphorical message, i.e., form, interaction, material/ texture, movement, sound, taste/smell, name, or graphics. To make the metaphor stronger, other means than just appearance can be considered when applying the metaphor.

6. Conclusion

The existence of metaphors, no matter in what medium, is a constant reminder to us that metaphors are a key instrument in any kind of communication. In this

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chapter, we have attempted to provide an overview of the use of metaphors in the product design field. To this end, we raised and proposed provisional answers to the questions of how designers use metaphors and how they can use metaphors in a "better" way. Every product metaphor is a story that a designer intends to tell through the product. The many different ways of generating good metaphors will be best communicated through exemplars and better represented by practice than by theory. In this regard, we hope that this chapter will provide inspiration to metaphor producers, who want to tell their own stories with imagination.

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Rock bottoms, juggling balls and *coalprints*

Exploring the metaphors L2 speakers of English produce in face-to-face interaction

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In comparison with the interest shown in the difficulties second language (L2) speakers have in understanding English metaphors, very little attention has been paid to examining the metaphors they actually produce, particularly in the oral mode. In this chapter I examine the metaphors used by L2 speakers in face-to-face interaction with native (L1) speakers or with other L2 speakers, using data from three different sources: the Vienna-Oxford Corpus of International English (VOICE), the European Corpus of Academic Talk (EuroCoAT), as well as smaller databases compiled in the course of other research. I consider the following aspects of metaphor production in L2 conversation: its frequency, its general characteristics, its conventionality, and some of the factors that prompt its use in discourse.

Keywords: metaphor, conversation, production, English as a second language, English as lingua franca, VOICE, EuroCoAT, repetition, systematicity

1. Introduction

People use metaphor for many and varied reasons: the topic of talk, the use of a metaphorical expression by another speaker, or the recognition that a metaphor is the most appropriate way to express an idea are only some of the factors that may prompt the production of a metaphor by speakers in the course of a conversation, be they native (L1) or non-native (L2) speakers of English. With regard to L2 speakers, there exist very few studies of how people expressing themselves in another language use metaphor in face-to-face conversation (but see MacArthur and Littlemore, 2011, MacArthur, 2016, or Pitzl, 2018) in comparison with how they employ conventional and unconventional metaphor in their writing (e.g. Chapetón-Castro and Verdaguer-Clavera, 2012, Johansson Falck, 2012, Littlemore et al., 2014, Nacey, 2013). Yet these contexts of use are sufficiently

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different to encourage researchers to examine how L2 speakers express themselves metaphorically when their discourse is unplanned and produced in the oral mode in response to the contributions of other speakers, and how this may differ from the way they use it in planned written or spoken discourse. As is well known, the fluency, accuracy and complexity of the language forms produced will vary significantly in response to task type and planning time (see R. Ellis, 2009, for an overview), so we will expect that findings on the metaphors produced by L2 speakers in planned written discourse (e.g. Nacey, 2013, Littlemore et al., 2014) may be somewhat different from those they use in spontaneous conversational interaction.

It is far beyond the scope of the present chapter to give an exhaustive account of metaphor use by L2 speakers of English when they converse with others. Such an account would entail a very lengthy research programme examining large amounts of conversational data. Furthermore, apart from the fact that the corpora of L2 spoken English currently available are much smaller than corpora of L1 English, such research is complicated by the fact that any meaningful description of the use of metaphor by people who are not expert users of the language would need to control not only for variables such as topic of talk, but also for the mother tongue of such speakers and their proficiency in the target language.

For these reasons, the aim of this chapter is simply to describe and illustrate some features of metaphor production in L2 conversation. It is possible to provide some indications of what type of metaphors are produced by L2 speakers in face-to-face interaction, as well as when and why. In turn, these findings point to interesting convergences and divergences between such speakers' use of metaphor in conversation and that of their L1 counterparts. However, further research is badly needed to extend the description offered here, in order to provide a more complete account of how speakers use metaphor when conversing in a second language.

This chapter begins by offering an overview of some of the questions that might guide research into analysing and describing metaphor use in L2 spoken interactions and some of the challenges posed by this kind of research. Before offering an analysis of some salient characteristics of L2 metaphor production, I first describe the sources of the transcribed conversational data on which this analysis is based, pointing to the limitations of these data in comparison with those available for L1 spoken English. After this, I consider in turn the following aspects of metaphor production in L2 conversation; its frequency, its general characteristics, its conventionality, and some of the factors that appear to prompt its use in discourse.

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2. Researching metaphor production in L2 speech: Issues and challenges

There are any number of questions that might be asked about L2 speakers' use of metaphor in spontaneous face-to-face interaction. Among these are:

a. Are there quantitative and qualitative differences between the metaphors produced by the same or similar cohorts of L2 speakers in their written production and in unplanned conversation?
b. Are there quantitative and qualitative differences in the metaphors produced by the different interlocutors in cross-cultural conversations (i.e. between L1 or expert speakers of the language and their L2 conversational partners)?
c. What purposes are served by metaphors in English as lingua franca (ELF) conversations? What communicative functions do they fulfil?
d. Are these broadly the same or different from their functions in L1 interactions?
e. To what extent do L2 speakers' metaphors replicate the conventional metaphors of L1 speakers?
f. What effect do novel metaphors or the inexact reproduction of conventional L1 metaphors have on communication between L2 speakers of English?
g. Is metaphor problematic in face to face conversations between people with a differing command of English or those who are using the language as a lingua franca?

None of these questions, to the best of my knowledge, has been fully answered to date. In fact, answering any of them would require a very lengthy research programme – and indeed some involve a certain amount of overlap with other research endeavours. For example, if we want to explore the question of density of metaphor use in L2 speech in order to compare this with metaphor use in L2 writing, the methods used for identifying metaphors in these different types of discourse should be the same (for example, MIP [Pragglejaz Group, 2007] or MIPVU [Steen et al., 2010a]). However, this is not always straightforward, because different researchers may use slightly different methods for identifying and quantifying metaphors in L2 writing. For example, Chapetón-Castro and Verdaguer-Clavera (2012) used a mixed method while Nacey (2013) used MIPVU and Littlemore et al. (2014) MIP.

A similar point can be made about comparing L2 and L1 use of metaphor in conversation. For example, unlike the MIPVU method used by Kaal (2012), Cameron's (2003) metaphor identification through vehicle analysis (her Vehicle Identification Procedure, or VIP) does not always take the word or polyword as the lexical unit for metaphor identification, meaning that the density of the metaphors

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in the conversations analysed by these two researchers can only very loosely be compared. Furthermore, as argued in MacArthur (2019), the very characteristics of L2 speech in spontaneous conversation (for example, calques of L1 metaphors by speakers of English as L2) pose their own problems in identifying and quantifying metaphors. Modifications to the methods designed for identifying metaphors in L1 discourse need to be made to account for this new context of analysis. Thus, although I compare the metaphors used by L1 or expert speakers of English with those uttered by Spanish undergraduate students in Section 4, I compare these with each other rather than with previous studies of the density of metaphor in conversation by Kaal (2012) or Cameron (2008).

In a similar vein, much the same can be said about the way that researchers approach identifying the communicative functions of metaphors in spoken discourse: similar methods would need to be used if any significant differences between how and why metaphors are used in L1 and L2 spoken interaction are to be identified. However, a question that is likely to be of interest only to L2 metaphor researchers is how successful the communication of an idea through metaphor is in L2 spoken interactions. Misunderstanding or miscommunication is an important issue in cross-cultural research generally. At the same time, it is notoriously difficult to gauge to what extent speakers understand each other, on the evidence of a written transcript of a conversation alone (Linell, 1995). And, in regard to ELF interactions, the problem is compounded by the fact that interlocutors very rarely question or challenge each other's utterances, preferring to tolerate incomprehensible input rather than asking for clarification (Firth, 1996; Seidlhofer, 2001). This unwillingness to display ignorance or hold up the conversation is so well known that it has come to be known as the "let-it-pass" principle (Firth, 1996; Seidlhofer, 2001).

Likewise, because metaphors produced by L2 speakers may be ill-formed if the standard conventional form in the L1 is taken as a yardstick, there arises the question of whether these should simply be discarded from a metaphor analysis or whether they should be included, but classed as errors, novel productions or even creative uses of language. The longest extant work on metaphors and idioms in ELF conversations (Pitzl, 2018) looks only at these kinds of metaphoric productions, classifying each use of an idiom or metaphor that departs from the standard canonical form in English as a creative use of language, even though the very same linguistic products might be regarded quite differently by second language acquisition researchers. Furthermore, although Pitzl's work provides a great deal of interesting detail about the kind of deviations from standard norms displayed by English as L2 speakers, it tells us nothing at all about the use of metaphors and idioms by L2 speakers generally, because the author did not attempt to identify all uses of metaphor in the VOICE transcripts she analysed.

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This incomplete account of metaphor use in a particular data set, such as Pitzl's analysis of part of the Vienna-Oxford Corpus of International English (VOICE, 2013), has knock-on effects. For example, the author (Pitzl, 2018, pp. 160–167) attempts to trace systematicity in metaphor use in L2 conversation, using a method very similar to that of Cameron et al. (2010). The results of this search for systematicity is, not surprisingly, somewhat poor, since only one type of metaphor is considered (i.e. "creative" metaphors). Yet this aspect of metaphor use in spoken interaction is likely to tell us a great deal about the quality of L2 interactions, because the ability to pick up, re-use or challenge another's words – or in this case metaphors – reveals much about the coordination between speakers and thus prove a good indication of how well a speaker is understanding an interlocutor's words. MacArthur (2016) examined systematicity in metaphor use in the individual academic mentoring sessions recorded in EuroCoAT (MacArthur et al., 2014) finding that the presence or absence of the same or similar metaphors across turns does indeed shed light on the quality of the different interactions between lecturers and their Spanish undergraduate students.

All in all, then, there is a great deal we do not know about how often and why L2 speakers use metaphors in face-to-face interaction. Evidently, the present Chapter cannot pretend to provide an exhaustive account of this phenomenon, nor to provide answers to all of the questions listed here. For example, I do not attempt to compare L2 metaphor production in written and oral modes, but rather focus only on the metaphors L2 speakers use in face-to-face interaction, paying attention to those areas which I regard as particularly interesting and worthy of further study. In Section 4, I examine the use of metaphor in academic conversations involving L1 or expert speakers of English and their Spanish undergraduate students. The comparison of the number and type of metaphors (identified using exactly the same procedure) used by the two cohorts sheds light on the relative frequency with which L1 and L2 speakers may use metaphor in the course of a conversation. In Section 5, I examine some of the conventional English metaphors used by L2 speakers, looking first at those that realise a particular conceptual metaphor or metaphor theme (in this case, "UNDERSTANDING IS SEEING"), before moving on to examine the different linguistic forms of conventional English metaphors and their presence and function in L2 discourse. The emergence and possible entrenchment of metaphors in L2 discourse is examined in Section 6, with particular attention being paid to the important role of repetition in establishing shared metaphorical construals in ELF. The Chapter ends with a summary of the findings and suggestions for avenues of future research.

However, before describing and illustrating the use of metaphors by L2 speakers in face-to-face conversation, it is necessary to first describe the sources of my data and their limitations.

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3. The data

Research into metaphor in L2 conversational discourse is handicapped by the fact that the corpora available are relatively small in comparison with those existing for L1 spoken English. For example, the British National Corpus (BNC) contains 10 million words of transcribed spoken English, while two relatively large corpora of L2 spoken English (the Vienna-Oxford Corpus of International English [VOICE] or the English as a Lingua Franca in Academic Settings Corpus [ELFA]) each contain only one million words of transcribed spoken data. On the face of it, this means that research into L2 speaker conversations might be hindered by the amount of data that can actually be closely analysed for metaphor use. Nevertheless, it should be recalled that the analysis of metaphor in L1 speaker conversations has tended to focus on the qualitative analysis of a relatively small number of conversations (e.g. Cameron, 2007) and even the most ambitious project reporting on the use of metaphor in English conversation (Kaal, 2012) only analysed a small part of the BCN-spoken: Kaal's sample fell far short of the 10 million words the BNC contains, examining only 504,738 words of conversational data (yielding 47,974 lexical units) contained in the BNC Baby. Likewise, Pitzl's (2018) study of the metaphorical language uses of L2 speakers only examined 51 of the 87 speech events contained in VOICE (or 638,900 words), and indeed paid attention only to those the author regarded as revealing some kind of creativity on the part of the speakers (Pitzl, 2018, p. 90)

This focus on relatively small amounts of conversational data or a selective approach to the data being studied is largely a consequence of the time that it takes to identify all the metaphors in a large corpus. It is only when rigorous methods for identifying metaphors or metaphor-related words (MRWs) in discourse are employed, such as MIP (Pragglejaz Group, 2007) or MIPVU (Steen et al., 2010), that a complete account of metaphor usage in a particular type of text or by a particular type of speaker can be given. Yet putting into practice these methods of metaphor identification (which require a 4-step analysis of each and every lexical unit in a text) is a virtually impossible task for the individual researcher if there are large amounts of data to be analysed in this way. Consequently, the decision to deal with a small number of conversations is only to be expected.

In the course of this chapter, I will illustrate the use of metaphor in L2 conversation by examining data from three different sources. The first is a corpus of 27 transcripts of conversations between Spanish undergraduate students talking to their lecturers at five different universities in Europe (MacArthur et al., 2014). Their talk dealt with three topics to do with the courses in which they were enrolled: the assessment systems used for the module in question, questions about a written or other assignment the students had prepared or were in the process

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of preparing, and problems experienced in understanding the course contents. This corpus, named the European Corpus of Academic Talk (EuroCoAT) consists of 55,718 words, 38,384 of which were uttered by the lecturers and 17,280 by the Spanish-speaking students.[1] All uses of metaphor in this corpus were identified using broadly the same procedure described by the Pragglejaz Group (2007), known as MIP, and were subsequently tagged to facilitate the quantitative analysis of the data (see MacArthur, 2019, for discussion of the methodology used).

The second source of data was gathered between 2010 and 2012 in the course of collaborative research conducted by Jeannette Littlemore and myself (MacArthur & Littlemore, 2011, Littlemore et al., 2012) and consists of transcripts of conversations on academic and non-academic topics between L1 and L2 speakers of English, recorded at the Universities of Birmingham, United Kingdom, and Extremadura, Spain. The transcripts of these conversations were likewise submitted to a rigorous process of metaphor identification (see MacArthur & Littlemore, 2011, pp. 209–213). I will refer to these conversations as "the Birmingham data".

Finally, I will illustrate some of the ways that L2 speakers produce metaphors in conversation by using data contained in the VOICE corpus. As has already been mentioned, this comprises a total of one million words made up of 151 transcripts of naturally occurring non-scripted interactions in English as a lingua franca (ELF). The speakers – with about 50 different language backgrounds – were involved in a range of different speech events in terms of domain (professional or educational, for example), function, and participant roles and relationships. In this regard, it is a much more heterogeneous corpus than EuroCoAT, and has not been tagged for metaphor use. All citations from this corpus are taken from the VOICE 2.0 XML version (2013).

4. L1 and L2 metaphor use compared: The EuroCoAT corpus

Academic discourse has attracted a great deal of interest from metaphor scholars. Steen et al. (2010 a, b) found that the density and type of metaphorical language used in newspapers, fiction, conversation or academic discourse varied substantially: metaphor is much more frequent in newspapers than in conversation, for example, and – perhaps more unexpectedly – more frequent in academic discourse than in fiction. In fact, among the four discourse types examined, these researchers

1. Of the 21 lecturers involved in these conversations, 14 were L1 speakers of English, while the remaining seven had different L1s: Greek (1), Spanish (1), Dutch (2), Chinese (1), Swedish (1) and German (1).

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found that the highest density of metaphorical language was to be found in the written academic texts they examined. Furthermore, other researchers have found that metaphor fulfils important ideational, interpersonal and textual functions in spoken academic discourse in English. Lecturers use metaphors to explain and evaluate concepts, organize their discourse, frame problems, or change topic (Beger, 2011; Corts and Pollio, 1999; Low, 2010; Low et al., 2008). In turn, this aspect of academic communication has proved to be especially problematic for international students studying at universities in the United Kingdom (Littlemore 2001, 2003; Littlemore et al. 2011). However, there existed no studies of how academics used metaphor in face to face interaction with their students – or how students themselves used metaphors – a research gap that the EuroCoAT project attempted to fill.

This research project involved recording academic mentoring sessions between lecturers and Spanish undergraduate students spending between 5 and 9 months at a university where English was used as a vehicle of communication. Seven of the lecturers were not L1 speakers of the language, but can nevertheless be regarded as expert speakers, and their overall metaphoric production can usefully be compared with that of the L1 lecturers as well as that of the students whom they were advising. The summaries provided in Tables 1 and 2 highlight the variation in density of metaphor use across the conversations as a whole (Table 1) and across the two cohorts (Table 2).

Table 1. EuroCoAT descriptive statistics: Variation in metaphor use across the 27 conversations. MRW = metaphor-related word.

EuroCoAT	N. conversations	Minimum	Maximum	Mean	Std. deviation
Tokens	27	1110	3964	2062.74	686.120
MRWs	27	120	648	253.15	105.953
Density %	27	8.4	16.3	12.2	2.08

Table 2. EuroCoAT descriptive statistics: Variation in metaphor use across the different participants (lecturers versus students).

Lecturers vs Students	N	total	Minimum	Maximum	Mean	Std. deviation
Tokens lectrs	27	38,384	638	3097	1421.63	551.302
MRWs lectrs	27	5,244	72	489	194.22	87.489
Density (%) lectrs	27		9.04	18.17	13.53	2.547
Tokens stdnts	27	17280	246	1409	640.00	291.143
MRWs stdnts	27	1591	17	159	58.93	32.229
Densit (%) stdnts	27		4.26	13.96	9.23	2.24

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As the tables show, although metaphor was present in all the conversations, and was used by all participants, it was used more or less frequently in the different mentoring sessions, ranging from a density of 8.44% (or 84 metaphors per 1,000 words) in a conversation about specific aspects of course contents between a lecturer (L1 English) and a student taking a module in the BSc in Health and Safety (UI5) to a density of 16.35% (or 163 metaphors per 1,000 words) in a conversation about exam preparation between a student and a lecturer in Business Studies (UI5). It likewise varied considerably across speakers: the lecturer who used fewest metaphors was an L1 speaker of English (UI6), followed closely by an L2 speaker at a university in the Netherlands, whose L1 was Dutch. Hence no clear correlation was found between the lecturer's L1 and the number of linguistic metaphors produced: while the highest overall density of metaphors (18.17%) was found in the speech of an L1 speaker of English (US1), similarly high densities were also found in the speech of lecturers using English as L2. For example, the lecturer participating in a mentoring session labelled US5 was an L1 speaker of German, and her speech registered a metaphor density of 17.57%. This is considerably higher than the figures cited in Low et al. (2008). In their analysis of three university lectures, Low et al. (2008, p. 435) found that the density of metaphors ranged between 10% and 13%.

Similarly, while the Spanish L1 students made less frequent use of metaphors than their teachers overall, these figures varied considerably across the different speakers, ranging from a density of only 4.1% (UI6) to over 13% by two students (UI5 and UNL4) doing different undergraduate degrees (Business Studies and Software Engineering, respectively). That is, the particular topics of each conversation had a greater effect on the amount of metaphor produced by the different expert speakers of L2 English than the L1 of each.

The overall comparison between lecturers and students (Table 3) indicates that the former not only produced more metaphors than students (5244 vs. 1591) but also that their discourse was metaphorically more dense (13.6% vs 9.2%). This is hardly surprising: as has already been found (Low et al., 2008, Steen et al., 2010, Herrmann, 2013), academic registers display a great deal of metaphor use and these lecturers, as members of research communities, would be familiar with the metaphorical language used in their disciplines to talk about academic topics. In contrast, the students, who were undergoing a process of disciplinary enculturation in their L2, would still be in the process of learning the language of academic communication in English. The difference between the two cohorts is thus to be expected and was found to be statistically significant (X^2 =196.9; df=1; p<.000; Cramer's V = 0.059). Evidently, expertise in English as L2 affects the type and amount of metaphor used.

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Table 3. Metaphor density: students vs. lecturers

	# words	#MRWs	MRWs (%)	# Non-MRWs	Non-MRWs (%)
S	17280	1592	9.4%	15315	90.6%
L	38384	5242	13.5%	33517	86.5%
Total	**55664**	**6834**	**12.3%**	**48832**	**87.7%**

The lack of alignment between the two cohorts, as reflected in the number of metaphors they employed, was also reflected in the kind of metaphors used by each group. As shown in Figure 1, the Spanish-speaking undergraduates' use of metaphor was mostly represented by function words (prepositions), whereas the lecturers, although they also frequently used prepositions metaphorically, made much greater use of lexical items (particularly verbs) to express their meanings metaphorically.

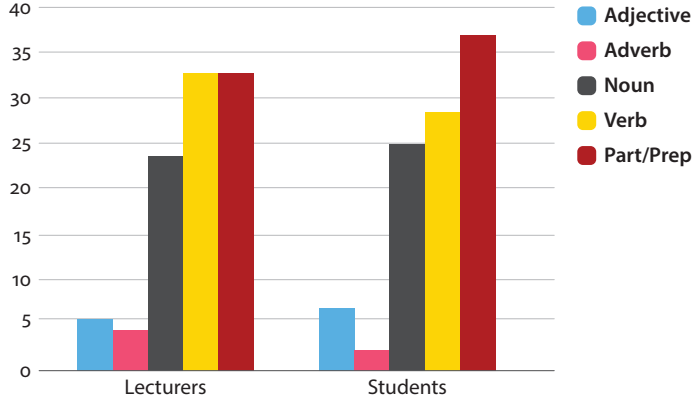


Figure 1. Metaphor and word class: Lecturers and students

5. Entrenchment: Conventional and unconventional metaphors in L1 and L2 discourse

5.1 The use of thematically related conventional metaphors in L2 speech

In studies of English, a great deal of attention has been paid to conventional metaphors, particularly those that are thematically related. The widespread use of words and phrases to do with the domain of SIGHT, for example, to talk about intellectual activity, has led to claims that these realize a conceptual mapping

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– "UNDERSTANDING IS SEEING" – that affects not only the way that people talk about intellectual activity but also how they think about it.

One way of tapping into the thematic relatedness or systematicity of metaphor use in discourse is to identify the semantic domains that may be under- or over-represented in a corpus, using the semantic annotation tool Wmatrix (see Nacey, this volume, or Hardie et al., 2007). MacArthur et al. (2015) reports on the "keyness analysis" carried out on the EuroCoAT corpus, using Wmatrix, finding that the semantic field "sensory: sight" was significantly over-used in the speech of the lecturers, with a Log-Likelihood value of 24.71 (using a value of 3.84 as a cut-off point for significance). The sight metaphors identified on the basis of the keyness analysis were realized by the words *see, look, focus, view, spot, reflect, notice, observe* and *viewpoint* and were used between two (*viewpoints*) and 78 (*see*) times by the lecturers in their conversations with these students. The lecturers' frequent use of sight terms to reason about academic activity in these office hours' consultations suggests that the metaphoric theme UNDERSTANDING IS SEEING is entrenched in the discourse of academic mentors in English-speaking communities. In contrast, although the Spanish-speaking students also employed some sight terms metaphorically (with the verb *focus* being the most frequent realization of the same metaphoric theme), they did so far less frequently and employed a smaller number of sight terms to talk about academic activity (see MacArthur et al., 2015, for details).

These findings regarding the difference between lecturers' and students' use of sight terms metaphorically in their discussion about academic work might be considered somewhat surprising given that this metaphoric theme is well attested in both English and Spanish (Sweetser, 1991, Fernández-Jaén, 2012): one might expect that the similarity in its realizations might facilitate an L2 speaker's metaphorical use of these sight terms in talk about academic work. The fact that we found this not to be so suggests that discourse practice prompts the production of certain metaphors rather than the existence of a conceptual mapping *per se*. Its relative absence in the speech of the Spanish students (and one Spanish-speaking lecturer) suggests that it is used much less frequently and in different ways in Spanish academic discourse. This draws attention to the fact that linguistic metaphors are a discourse phenomenon, and attention must be paid to the discourse contexts in which they occur, rather than their overall presence in large corpora. Furthermore, it is important to recall that, in order for any type of linguistic behaviour to become customary or normalized, it has to be repeated again and again by different speakers across different speech events. Repetition, whether exact or approximate, thus sheds light on the emergence and stabilization of metaphors in L2 discourse, a topic I return to in Section 6.

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5.2 Conventional phraseological metaphors in VOICE

As analysis of EuroCoAT has shown (see Figure 1), even L2 speakers may reproduce conventional L1 patterns of metaphorical usage, particularly when it comes to function words like prepositions. In fact, it would be difficult for the L2 speaker to claim to be speaking English at all if s/he is not able to produce the extended temporal meanings of spatial prepositions, for example: these words play fundamental roles in the grammar of English and are often the focus of teaching/learning activities that encourage their accurate use.

At the other end of the spectrum, we find larger linguistic units – multi-word units (MWUs) – that may be metaphorical. Some of these phraseological metaphors appear to be used very infrequently, if at all, by L2 speakers, while others may be produced very often.

One kind of phraseological metaphor is the idiom, which plays important discourse and affective roles in L1 English discourse (Drew and Holt, 1998, Moon, 1998). Pitzl's (2018) fascinating analysis of how the L2 English speakers recorded in VOICE creatively exploit a number of English idioms (for example, 'in a nutshell', 'in (on) the same boat' or 'hand in hand', among others) describes some of the realizations and functions of idioms in English as *lingua franca* conversations. Indeed, this important contribution to our knowledge about the metaphors L2 speakers produce in unplanned conversation confirms that L2 speakers sometimes produce idioms in their discourse and indeed creatively exploit them. However, if one takes a random selection of English idioms recorded in a standard reference work such as *The Collins COBUILD dictionary of idioms* (1995) a somewhat different, more nuanced picture emerges. Searches of the VOICE corpus for the idioms 'hot potato', 'beat around the bush', 'cut corners', 'let the cat out of the bag', 'once in a blue moon', or 'cost an arm and a leg' return no hits at all. In contrast, 'BREAK the ice' is found used twice (by two different speakers in the course of different conversations: POwgd442 and POwsd257).

The absence of idioms such as those searched for in the VOICE corpus does not tell us very much on its own, because idioms are also found very infrequently in L1 discourse (Moon, 1998) and their absence in a much smaller corpus may simply mirror the same trend. However, it is also true that idioms, by their very nature, constitute a particular kind of insider talk, and their absence in conversations involving people who are not members of the L1-speaking language communities from which they emanate may indirectly reflect that "outsider" status (see Seidlhofer, 2009, or Pitzl, 2018, pp. 43–44, for further discussion).

In contrast to the findings for these idioms in VOICE, a search for words such as 'hand', 'back' or 'view' give a different picture of fossilized phrases with metaphorical senses in L2 spoken discourse. For example, in English, 'back' occurs in a number of MWUs with metaphorical senses: when referring to the past it is found

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in combinations like 'look back at' (remember) or 'come/go/get back to something' (to refer to something already mentioned in the discourse). And it is also used in idioms such as "see the back of someone or something' (not have to deal with someone) or 'turn your back on someone or something' (to refuse to accept someone or something that you have previously accepted). A search for this word in VOICE reveals no uses of the idioms 'see the back of someone or something' or 'turn your back on someone or something'. In contrast, phrasal-prepositional verbs with 'come/go/get back to something' are used relatively frequently by the L2 speakers in VOICE. Of the 114 hits returned for 'COME back', 30 (or 26%) are metaphorical uses, as illustrated in the following example:

(1) 243 S1: the necessary material and financial support to make such projects possible and that i would just would like to **come back to** what you said because i sort of er dismiss this idea of voluntary work in a company (POwgd524)

Overall, of the 537 returns for 'back' in VOICE, 66 are uses that closely resemble these, but in combination with other verbs (go/get/be/bring back to), and are all used to refer to something previously mentioned by the speaker or another participant in the conversation. Not all of these productions are completely native-like, as can be seen the speaker's use of 'at' in (2):

(2) 392 S9: erm or the these structures can themselves implement like for example sorry **to keep coming back at this** but the kosovo youth action councils will be implementing the kosovo youth action plan as a governmental strategy (POwgd510)

The frequency with which L2 speakers produce L1 metaphors like this has a number of possible explanations. One is that their discourse management function makes them particularly salient and frequent in discourse and hence easily recalled and re-used by L2 speakers. The VOICE conversations involve more than just two speakers, and many of the speech events transcribed are business meetings or group discussion (workshops and seminars) where it may be important for speakers to signal how their contribution relates to the topic being discussed. In fact, it seems that some of the metaphorical phrases that are regularly used to manage discourse in English are produced fluently by the L2 speakers in these transcripts, as examination of the words 'hand' and 'view' in VOICE confirms.

Searches for 'hand' in VOICE return 214 hits. Of these, 34 occur in the string 'one hand' and 77 in 'other hand'. A closer look reveals that 23 uses of 'one hand' and all 77 with 'other hand' are metaphorical, and are used in the strings 'on the one hand' and 'on the other hand' (to present alternative arguments). That is, in VOICE nearly half (46.7%) of uses found of 'hand' are metaphorically used to organize a speaker's discourse, as in the following case:

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(3) 597 S6: and maybe in this part we really should define erm the roles of of everybody
598 S2: exactly and responsibilities
599 S6: you know and responsibilities it can have
600 S1: yeah
601 S9: because we don't need overlapping **on the one hand** and **on the other hand** we don't need you know people saying ah this is my job (POmtg314)

As already seen in (2) (where the preposition 'at' was inserted in place of the more idiomatic 'to'), L2 speakers may produce the key metaphorical word (in this case, 'hand') but omit or alter other elements in the string. Of the 23 strings containing 'one hand', seven do not replicate the L1 usage ('on the one hand') but contain a different preposition or omit the definite article.[2] Interestingly, the same speaker (S3) taking part in the same meeting (PBmtg269) produces 'on one hand' (4) and also 'one hand' (6) in the course of the same conversation, seeming to mean the same thing by both forms:

(4) S3: this is the reality we have to face this is the the the the biggest risk from the perspective of consumers and probably consumers' organizations as such er key messages erm key messages this is er another things which we have er how to say there is always er d- discussions around because **on one hand** the key and major message which we would like to be transferred to the consumers that our [thing1] are er thirty-three per cent more compacted and v- via this are more convenient for the for in in usage okay but **on the other hand** er the point is that by the way this is an environmental aspect in this so our [thing1] will be probably via this reduction will be probably will be via this reduction er more environmental friendly or no [thing1] cannot be environmental friendly [thing1] are er less harmful from environment (PBmtg269)

(5) 1598 S2: **in one hand** we have english as a lingua franca in xxx xxx so each one is speaking in eng- everyone is speaking in english and and his own language (EDwsd304)

(6) 846 S3: i would say that **one hand** there is an association okay association industry is talking about the project (PBmtg269)

L2 speakers' use of *view* in VOICE also show that production of L1 phraseological metaphors is frequent when it comes to those that play important discourse

2. There is of course evidence that, while 'on the one hand' appears to be the most frequent form, many L1 speakers also omit 'the' in this phrase. See Koering (this volume) for discussion.

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management roles. There are 225 hits for this word in the corpus, of which 23 involve the string 'in * view' (only four of which are literal) and a further 117 'point of view' (referring to a belief or attitude). All in all, then, at least 60.4% of uses of *view* in VOICE are metaphorical and are used to hedge an opinion or attitude to a topic (i.e. as X understands Y). As with the uses of 'back' and 'hand', these uses include formulations which are absolutely idiomatic in L1 English, as well as others that are less usual:

(7) 1104 S11: and this is the the reason why i i understand your **point of view** (EDsed31:)

(8) 1483 S2: to i i start over again er [org2] we're er at the moment **in the point of view** to er expand ourselves again and er germany is er this year on the road to er open our own online station so pure a [org2] station and er officially we may announce it will be frankfurt or munich (PBmtg300)

(9) 708 S12: to arrive at that goal let me say these answer er so one in **in my view** is top-down (POwgd325)

Metaphorically-used MWUs are therefore produced relatively frequently by L2 speakers in VOICE when such phrases fulfil specific discourse functions which are relevant to the communicative needs of speakers in particular contexts: expressing opinions, contrasting ideas or arguments or establishing links between different parts of a discourse ('to go/come back to something', for example) are evidently things that speakers involved in group discussion need to be able to do. In contrast, the evaluative commentary of other kinds of metaphorical MWUs ('cut corners', 'cost an arm and a leg') appear to be less relevant to the communicative needs of the L2 speakers recorded in VOICE. This finding, which would need to be confirmed by a more thorough metaphor-driven analysis of the VOICE corpus, would be in line with findings from previous studies. For example, Herrmann (2013) found that, among the 10 most frequently used verbs metaphorically in the corpus of academic texts she examined, 'see' was most frequently used for "text internal deixis" ('See X for …') (Biber, 1988, p. 105) and, in general, Hermann (2013) found that metaphors are frequently used to organize text in L1 discourse. Curiously, although some of the examples cited here are precisely the type of "creative" idioms and metaphors examined by Pitzl (2018) – that is, non-canonical forms of English phraseological metaphors – this quite salient function of organizing discourse is not even mentioned in her study.

5.3 Conventional single word metaphors in VOICE

While it appears that a great many metaphors are realized as fixed and semi-fixed phrases in English (Deignan, 2005), metaphorical uses of content words (nouns,

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verbs, adjectives and adverbs) may not display this tendency towards fixedness in word strings, collocating instead with other words in relatively free combinations. So, for example, the verb 'spark' (roughly meaning "cause to happen") can conventionally be followed by three different types of nouns in direct object position: those that denote fires or explosions (e.g. 'spark a fire'), those that denote violence or disagreement (e.g. 'spark a riot') or those that are related to thought processes (e.g. 'spark a memory/an interest in something'). The first is the basic sense of *spark*, which derives from the nominal denoting a very small piece of burning material. The noun can also be found associated with the conventional metaphorical senses of the quality of intelligence or creativity (e.g. 'a bright spark'), a short feeling associated with emotions (e.g. 'a spark of anger') or the starting point or cause of a process (e.g. 'spark of unrest/life'). A search of the BNC-spoken for the word 'spark' returns 558 hits, and reveals that L1 speakers of English frequently use this word in conversation to denote something other than a very small piece of burning material (noun) or starting a fire or explosion (verb). We find the word is used in habitual metaphorical collocations such as 'bright spark' or 'spark of life' or as a verb in 'spark a syndrome' or 'spark off a process'. In contrast, if the same search is carried out in VOICE, the word returns no hits at all, although we might expect – in terms of the size of this corpus in comparison with the BNC – something like 55 hits. Its complete absence raises a number of questions. For example, does this simply indicate a lack of familiarity with the word itself, let alone its metaphorical senses, on the part of the L2 speakers involved in the conversations transcribed in VOICE? After all, if L1 speakers use these conventional metaphors relatively frequently, surely the L2 speakers should too? Or is it simply a consequence of the kind of conversations these speakers are engaging in and the fact that the topics dealt with in each do not call for talk of intelligence ('bright spark') or initiating a process ('spark off a process')? In order to answer these questions, it would be necessary to analyse all of the BNC-spoken in order to discover when and why 'spark' is chosen to express a metaphorical meaning and – equally importantly – when a synonymous word or phrase is used in its stead. A subsequent analysis of the VOICE corpus (using the results of this full analysis as a point of comparison) would allow us to decide whether L2 speakers are actually avoiding literal or metaphorical uses of *spark*. On its own, the absence of any tokens cannot tell us anything about how L2 speakers express – metaphorically or not – the range of senses expressed by this word.

5.4 Novel uses of conventional English metaphors in VOICE

Finding that a word such as *spark* is never used either literally or metaphorically in VOICE is, by itself, not particularly interesting. In contrast, searches for

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other words that are frequently used with metaphorical senses in English may reveal some interesting divergences between the way that L1 and L2 speakers express themselves metaphorically. For example, a search for uses of another word – 'rock' – is quite revealing in relation to notions of conventionality and entrenchment in discourse, showing how L1 and L2 speakers may diverge in their metaphorical use of English words and phrases. A search for 'rock' in the two corpora returns 251 hits in the BNC-spoken but only nine in VOICE. This numerical difference is certainly of interest, but much more arresting is how the word is used in the L1 and L2 conversations. In the BNC, most uses of 'rock' denote a hard solid substance and it also occurs frequently in place names (for example, Castle Rock); however, it also is also found used metaphorically in a range of conventional, semi-fixed phrases as a noun – 'be at/hit rock bottom', 'rock and roll'; 'rock concert/band/star'; 'stuck between a rock and a hard place'– and as a verb: 'rock the social order' or 'rock the boat', for example. In contrast, in VOICE, we find no uses of 'rock' to designate a place or a hard solid substance, which seems to suggest that topic of talk clearly affects its use in context; instead, we find five cases of 'rock star', one of 'rock music' and three of 'rock bottom', all of which are arguably metaphorical. Most interesting of these is 'rock bottom', which is used in only one conversation (a business meeting at a forwarding agency with a sales representative of an airline) three times by the same speaker leading the meeting (S1). Each occurrence is highlighted in bold type in the following excerpts from the transcript:

(10) 1451 S1: I mean there are some weird scenarios IN there we have to see how the: er surcharges develop which are at the end of the day ARE part of the RATES so if we take hhh your decreased rates e:r in comparison to one year before what you have the INCREASED surcharges <fast><soft> at the end of the day nothing has changed</soft></fast> hh but as we know clients you can <pvc>easilier>/pvc> sell this as SURCHARGES of <un> xx </un> clients SOMEHOW they have never recognized that there is nothing else on the rate but (.) IF it's the way it is(.) WAIT and see (.) but I expect for two thousand four that we really go for for REAR (.) break e:r **rock-bottom** break points

1452 S2: yeah. (.)

1453 S1: yeah?

1454 S7: mhm

(11) 1830 S7: <soft> mhm </soft>

1831 S2: = yeah?

1832 S1: give the **rock bottoms** to us we will look into it (.)

1833 S2: mhm

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(12) 1865 S2: yeah (.)
1866 S1: that's it (.)
1867 S2: yeah
1868 S1: and you know the shanghai rates are decreas<2>ing</2> er <spel> u s </spel> dollar is decreasing so at the end of the day it's **rock bottom**
1869 S7: <2><soft> yeah </soft></2>
1870 S2: yeah
1871 S1: whatever (.)
1872 S2: uhu

(VOICE: PBmtg300)

S1 is the head of the team at the forwarding agency which is hosting the meeting, while S2 is a sales representative from another company As can be appreciated from these extracts, only S1 produces 'rock bottom' and does so in different ways. In the first mention, 'rock bottom' is used as a classifier ('rock-bottom break points'); in the second as a plural count noun ('the rock bottoms') and in the third as Subject Complement ('it's [the rates] rock bottom'). None of these uses matches those found in the BNC. Although 'rock bottom' is found in noun phrases in L1 English, it collocates with nouns such as 'prices', not 'break points'. Furthermore, L1 English speakers do not appear to use it conventionally as a count noun or regard 'a rock bottom' as something that can be 'given' to someone else (literally or metaphorically). Yet, just because these uses do not appear to be conventional in L1 speaking communities, this does not disguise the fact that these uses of 'rock bottom' appear to be absolutely conventional and transparent for the group of speakers involved in this business meeting. None of the participants query the first speaker's use of the phrase and indeed show their understanding by their conventional responses to its use in context with tokens like 'yeah', 'mhm' or 'uhu' which signal that speakers are following another's words. This appears, then, to be a case of a metaphor that is absolutely conventional in a particular discourse community but would most likely be incomprehensible to outsiders. This is exactly the same phenomenon as found in L1 discourse (Deignan et al., 2013). Groups of speakers who gather regularly and talk about similar topics will tend to employ metaphors that are peculiar to their own discourse community.

How these uses of 'rock bottom' became conventional for the business people involved and could be understood by the sales representative who attended this meeting (an outsider to the forwarding agency itself) cannot be reconstructed on the basis of one conversation alone. It can be speculated, however, that the specific metaphorical senses of 'rock bottom' as used by these speakers must have emerged at some point in conversations on similar topics and been re-used on further occasions. In this regard, Brennan and Clark's (1996) description of "conceptual pacts" in interaction sheds light on how new coinages may emerge in discourse and may – or may not – be re-used later:

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> [W]hen speakers ground a reference they are creating a *conceptual pact*, a temporary agreement about how the referent is to be conceptualized. So when the same speakers face new addressees, they have to establish new conceptual pacts, and these may not be the same as those established with previous addressees.
>
> (Brennan and Clark, 1996, p. 1484)

Brennan and Clark's notion of conceptual pacts has been explored by Gibbs and Cameron (2008) in relation to the emergence of metaphor in discourse and proves particularly enlightening when considering the emergence, stabilisation and entrenchment of metaphors in L2 discourse.

An example of the way that a novel metaphor emerges in a conversation can be illustrated by the way a group of speakers use the word 'puppy' in a transcript from the VOICE corpus (EDcon496). In the BNC-spoken, there are 50 hits for this word, 45 of which are literal (referring to a very young dog) and only one metaphorical, in the collocation 'puppy love' (i.e. an immature love that does not last). In contrast, the salient metaphorical sense for three L2 speakers with different mother tongues[3] is that of "immature young male", and, in particular, his physical appearance:

(13)
160 S2: who's the tutor for the project
161 S1: [last name3]
162 S2: oh him @@@
163 S3: but i found him smart in some way
164 S1: so i basically say okay good morning erm
165 S2: hm
166 S3: [last name3]
167 S2: mhm
168 S3: i found him smart in some way
169 S1: hh
170 S2: he is smart but the thing is he doesn't know how to act around me cos i'm older than he is @ @@@ @ @@@@
171 S1: true true
172 S3: yeah
173 S1: he's a young **puppy**
174 S3: he's like what twenty-five twenty-six
175 S2: he's twenty-six or twenty-seven
176 S1: seven
177 S3: and already become a teacher
178 S1: erm
179 S2: mhm because he's a nerd

3. The interaction is between three students meeting to prepare a presentation. Two are males whose L1s are Venezuelan Spanish and Indonesian. The third speaker, a female, is from the Netherlands and is an L1 speaker of Dutch.

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As can be seen from this first use of 'puppy' in this conversation (173), the youth of the person referred to is viewed negatively. Only one of the speakers (S1) uses the term metaphorically, later applying this derogatory sense of 'puppy' to himself:

(14)
212 S2: you're not going to fail [S1] just go home concentrate read the thing again
213 S1: hh ah
214 S2: and just have a good night's sleep go on your date or whatever you want to do tonight
215 S1: no i'm not going to cos i gotta man i've shaved i look **like a puppy**
216 S2: so maybe she likes **puppies**
217 S1: oh man no but this you're a woman
218 S3: is that what's bothering you your shaving @ @@@
219 S1: @@@@
220 S2: i don't mind a **puppy** look from time to time
221 S1: from time to time
222 S3: it's a ritual man @@ man's shaving
223 S2: yeah
224 S1: i haven't shaved in the longest time like all of it like it's all gone
225 S2: **puppy**
226 S1: and they're probably thinking something else no it's my face we're talking about

In the second extract, we can observe that a second speaker (S2) recycles the word 'puppy' three times, and on each occasion the use of what might perhaps have been an *ad hoc* use by S1 of the word to denote immaturity becomes shorter ('look like a puppy' > 'she likes puppies' > 'a puppy look' > 'puppy'), as predicted by Brennan and Clark (1996). The metaphor thus appears to emerge in the discourse to become part of a shared way of talking about an undesirable physical appearance, which is marked as insider discourse by S1's comment in 226, which clarifies the grounds of the comparison for outsiders listening to the recording of their conversation. This coinage, then, may be reused on further occasions and the denotational and evaluative senses of this metaphorical use of 'puppy' become part of the discourse practice of these speakers on future occasions, possibly extending further in conversations they hold with other speakers.

6. Repetition: Quoting and misquoting others' metaphors

Cameron and her colleagues (e.g. Cameron, 2003, 2008, 2010; Cameron et al. 2010) have examined metaphor shifting in discourse, adopting the view that finding "[s]ystematic connections between semantically similar metaphor vehicles

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on the one hand and the topics they express on the other, [will] open a window on the ideas, attitudes and values which may be active in speakers' or writers' minds at the time they engage in the discourse" (Cameron et al., 2010, pp. 116–117). Metaphors can be developed in conversation (by one speaker or by both/all participants across turns) in various ways: the vehicle term (metaphorically used word or phrase) can be repeated in identical or transformed form; relexicalised (with the use of a near synonym); explicated (such as when the term is expanded, elaborated or exemplified); or contrasted (such as when an antonymic or contrasting term is used) (Cameron, 2010, p. 89). When metaphor vehicles are developed in this way, we may say we have a systematic use of metaphor in the discourse.

Two studies (MacArthur and Littlemore, 2011, and MacArthur, 2016) have examined the Birmingham data and the EuroCoAT corpus for evidence of the kind of systematicity described by Cameron and her colleagues in conversations involving L2 speakers of English. The focus in these studies was on the systematic use of the same or similar metaphor vehicles across turns and what it might reveal about the quality of the interaction L1 and L2 speakers engage in, a useful way of approaching conversations where speakers do not share the same linguistic or cultural background. This is because when participants in a conversation jointly collaborate in the development of a metaphor, this reveals a close coordination of meanings and understandings. Repetition and elaboration of another's words – metaphorical or not – have been shown to be important in spoken dialogic discourse as this helps build rapport and provides close connections, as well as contributing to topic development across turns (Tannen, 2007). However, these two studies revealed that the kind of systematic use of metaphor found in L1 discourse is mostly absent in L2 conversations. Speakers may pick up on another's metaphor, by repeating it exactly or with minor modifications (for example, *clear* > *clearer*) but we found no evidence of L2 speakers' relexicalizing, explicating or contrasting (challenging) their interlocutor's metaphor. That is, the simple repetition of another's metaphor appears to be the only feature of L2 interactions that gives an idea of the coordination between speakers and the sharing of an idea which has been expressed metaphorically. In this section, I examine and illustrate this kind of verbal behaviour.

Metaphors may be created deliberately by people seeking useful ways to conceptualise an emergent concept. This is the case of several metaphors used in two workshop discussions on the topic of the future of Europe as regards intercultural unity and diversity (transcripts EDwgd305 and Edwsd15 in VOICE). One of the chairs at these discussions (S1) draws attention repeatedly to the fact that the participants are using metaphor in order to voice their idea of Europe:

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(15) 629 S1: nice metaphor (Edswd15, in response to the "family" metaphor)

(16) 709 S1: also a nice metaphor i thought it was very nice that (EDswd15, in response to the "lego" metaphor)

(17) 711 S1: i think all the scenarios used a metaphor to you know clarify their concept (EDswd15)

Pitzl (2018, pp. 190–192) looks at an analogy used by one of the discussion groups ("the European salad bowl"), as an example of intentional metaphoric creativity but another case – the 'lego' analogy – is also worth close examination from the point of view of how a metaphor may be negotiated and agreed on in group discussion. The 'lego' metaphor is presented by one group of participants in the workshop discussion in the following way:

(18) 558 S25: they are learning so much languages and because when you have learned one language they can go further and there is just you know europe is just i feel it you don't feel Europe
559 SS: @@@@@ @@@
560 S24: it's just xxx on the television you have a channel there is
561 SS: @@@@@@@@@@
562 S24: europe you have you have loads of things the school system we can exchange whenever we want we we can go to school we can exchange in word you just have one unity europe and i think europeanty
563 S25: yeah by the way er about going somewhere
564 S9: @@ @@@
565 S25: i don't know why i'm staying here and talking to you because xxx pack my luggage for going to italy
566 S24: oh yeah
567 SS: @@@
568 S23: x **lego**
569 S25: xxx **lego**
570 SX-17: **lego** xx
571 S26: **lego land**
572 SS: @
573 SX-f: xx xx
574 SX-27: **lego** x
575 S23: this is our title of our erm erm er
576 S26: scenario
577 S23: yes thank you
578 SS: @@@@ @@@@@
579 S23: **lego**
580 S25: language european go
581 SS: @@
582 S25: language of europe go

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The first thing to be noted is that 'lego' is repeated five times, by five different speakers, showing that there is agreement among them on its use as a title for their "scenario" (576) and that they rehearse the word for use on future occasions. The clarifications made by S25 in 580 and 582 ("language European go") seems to indicate that 'Lego' is an acronym rather than a metaphor. Yet, later on in this discussion, it becomes clear that, for these speakers, it is more than a simple acronym and that the name of the toy (consisting mainly of interlocking plastic bricks) that goes by this brand name is being used metaphorically to denote European diversity and unity:

(19) 701 S4: erm i just wanted to fill in one more gap er just in my notes erm the name of the forth[4] scenario it was lego
702 S23: lego
703 SS: lego
704 S4: lego just lego
705 S24: yeah but there's a lot behind lego
706 S4: lego land in translated into all the
707 S24: yeah there's a lego you've one lego you've loads of color xx but there is one unity you can put loads of lego on you can build unity
708 S26: you can build something together

One speaker (S5) has been responsible on an earlier occasion for proposing 'lego' as a metaphor for unity and diversity (EDwgd305:1239) in response to another speaker's suggestion that "we should think of something … that is colourful" (EDwgd305:1225) and this suggestion is then discussed among the whole group (EDwgd305:1239–1489), with multiple repetitions of the vehicle terms 'lego' and 'lego land'. And it is this discussion which is being remembered and recycled in the later workshop discussion (EDwsd15). It should be noted, however, that quite apart from the fact that these speakers establish a pact to name the concept of unity and diversity – and write it down – the term must be stored in long-term memory in order for it to be produced by each speaker on a later occasion.

Conversely, novel metaphors produced by one speaker and not repeated by another do not have the status of a pact (although they may be well understood) and are therefore unlikely to become a conventional way of referring to something in their discourse. For example, there is only one use of the 'juggling ball' simile in the whole of the VOICE corpus:

(20) 630 S2: i have always text you know i put them down i i throw them up **like a juggling ball** and i kind of xxx kind of turns out somewhere i i'm not used to writing with with a pen any more hh i can't do it m- my mind is so so you know erm i work like er on the web you know i have need to kind of have a erm cu- er cut and copy er

4. Sic. This is the spelling in the 2.0 version of VOICE

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631 SX-f: mhm
632 S4: yeah
633 S2: and paste structure (EDcon521)

A metaphor that is not picked up and repeated by other speakers is unlikely to survive beyond the context in which it is used. Furthermore, it has to be remembered so that it can be replicated in another speech event. And here we may find the explanation for some of the more unusual metaphoric productions of L2 speakers, which appear to be inexact repetitions of what another speaker has said. In some cases, the approximate rendering of an L1 metaphor can be noticed immediately, as when a Spanish undergraduate student (José M) engaged in conversation with a lecturer (Debbie) at his home university (Birmingham data):

(21) Debbie: Does it help you when you have assignments to have very clear erm steps to follow and guidelines?
José M: Yes
Debbie: Or do you prefer when you're freer to decide?
José M: I prefer following the steps in the headline
Debbie: In the guidelines
José M: In the guidelines, 'cos I think I work better if I follow a pattern of the- the guidelines

As can be appreciated from the metaphorically used words underlined, José M repeats two of the word the lecturer has used metaphorically ('steps' and 'follow') but misrepeats 'guideline'. However, he does not request a repetition of a word he might have misheard, nor does he utter a word that does not exist in English. Rather, in his production of 'headline' he utters a word that is phonologically similar to 'guideline' but appears more readily available to him in working memory. Debbie models the phrase for him again ('in the guidelines'), and his own repetition then allows him to produce it in an original formulation of Debbie's original wording ('steps to follow and guidelines' > 'follow a pattern of the guidelines'). The teacher's correction – a simple repetition- thus leads to the student's successful appropriation of the metaphor. Whether this led to his producing this particular metaphor in other speech events is impossible to tell. However, he has learned it well enough to be able to use it accurately in this particular conversation.

In teaching/learning contexts, repetition allows corrective feedback to be provided, as Debbie does here, in order to facilitate learning. However, such corrective repetitions are extremely rare in conversations between L2 speakers of English, that is, in English as lingua franca conversations. Rather, it has been found that, in this context, speakers demonstrate a remarkable ability to ignore incomprehensible, ungrammatical or otherwise ill-formed utterances, preferring

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to let such utterances pass rather than request a repetition or clarification of a conversational partner's meaning. Mutual intelligibility rarely appears to be a problem – or at least, is rarely signalled as a problem (Seidlhofer, 2001, Firth, 1996, House, 1999) although the analyst might very well suspect that speakers have not fully understood each other.

For example, in conversation with a female L1 speaker of English (Komal) on the topic of climate change, a speaker (Aleksy) with forty years of experience of English living in the UK (L1 Polish) used the form 'coalprint' or 'coal print' (Birmingham data. See MacArthur and Littlemore, 2011), a compound that is not recorded in any standard dictionary of English:

(22) Aleksy: China's a country or India's a country, they are putting far too much of that stuff in the air, but if you re- if you – if you calculate it per person {our}
Komal: {yeah}
Aleksy: as we call {it}
Komal: {yeah}
Aleksy: **coal print** is the highest in the world. You sit here, and if you think about what you're{doing now}
Komal: {we've got} all the technology
Aleksy: yeah, and that's all costs energy
Komal: that makes sense

Aleksy's use of 'coal print' would almost certainly have been unfamiliar to his interlocutor, yet, as can be seen, it caused no problem for the interaction, although most English language teachers would doubtless be quick to correct this as an error. When conversational partners focus on the propositional content of each other's utterances – and the context is sufficiently rich to facilitate understanding – they may be able to make perfect sense of an unconventional metaphor, as Komal signals she has done here ("that makes sense"). Another question entirely is what prompted Aleksy's novel metaphor. It is impossible to do more than speculate about metaphoric productions such as this, but it seems reasonable to propose that an L1 speaker would have produced 'carbon footprint' in this context, and therefore not farfetched to suggest that Aleksy's production was very similar to José M's use of 'headline' instead of 'guideline'. That is, a previously, better known word (e.g. 'coal' or 'print'), which shares some phonological or semantic similarity with the new cue word ('carbon' or 'footprint') is substituted in the new expression, in a way that has been described by experts in L2 acquisition (see N.C. Ellis 2006 for an overview). This phenomenon is hardly surprising: L2 speakers do not process their second language in the same way as L1 speakers, and input does not necessarily become intake – as is revealed by some of the metaphorical

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output cited here. Inexact or approximate repetitions of others' metaphors does not necessarily characterize L2 speakers' production of conventional English metaphors in conversation, although such misquoting does happen.

7. Summary of findings and avenues of further research

When a researcher examines L2 speech for the first time, it might appear a reasonable hypothesis to expect that s/he will find a much lower density of metaphor use in comparison with L1 discourse. After all, if metaphor is so problematic for L2 speakers of English, as various studies of international students' misunderstanding of the metaphors their lecturers use have shown (e.g. Littlemore et al., 2011), surely one would expect that L2 speakers would tend to avoid using metaphors themselves? This hypothesis is not borne out by the evidence available. As has been seen again and again throughout this Chapter, L2 speakers use metaphor frequently in conversation, and may indeed do so even more frequently than their L1 counterparts, as was seen in the case of a German-speaking lecturer in Section 4, whose speech in conversation with a Spanish Erasmus student registered a density of 17.57% metaphorically used words. This was a far higher figure than some of the L1 English lecturers engaged in the same kind of conversations with the Spanish students or with the figures cited by Low et al. (2008) for lectures. Similarly, the Spanish undergraduate students used metaphors themselves, although not as frequently as the lecturers. However, even here, there was a great deal of individual variation, with some students registering density figures as high as 13%, which was much higher not only than the other students but also than several of the L1 lecturers. I have suggested that the topic of conversation had an effect on the higher or lower number of metaphors used by the different participants in these academic conversations, but another reason for this variability could well have been the different speakers' proficiency in English generally. We did not examine the relationship between proficiency in English and metaphor production in face-to-face interaction in the EuroCoAT project because the data gathered in relation to proficiency levels (of both students and lecturers) was unreliable. However, it seems likely that this factor played an important role in the frequency with which the different L2 speakers employed metaphor and what kind of metaphors they used.

In a similar vein, one might expect L1 transfer to facilitate the use of particular kinds of metaphor in L2 speech. For example, another reasonable hypothesis when beginning to examine L2 metaphors in conversational interaction is to propose that if a metaphor theme or conceptual metaphor such as "UNDERSTANDING IS SEEING" exists in both English and a speaker's L1, the L2 speaker will use the linguistic realisations of the metaphor in ways similar to an L1 conversational

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partner. However, examination of the EuroCoAT corpus shows that this is simply not so. This metaphoric theme exists in both Spanish and English, yet the L1 lecturers used it far more frequently than the Spanish speaking students. At the level of discourse, such metaphoric themes may manifest themselves in quite different ways in different speech communities, and the mere existence of equivalent metaphoric expressions does not appear to facilitate or encourage their productive use in L2 conversations.

Overall, the picture that emerges from analysis of L2 conversations in the three sources of data drawn on in this Chapter is that all L2 speakers use metaphor in their conversations – indeed, it would be almost impossible to communicate in English without doing so. However, L2 speakers do not use the repertoire of linguistic metaphors available to them in English in exactly the same ways as L1 speakers do. As was seen with regard to the EuroCoAT data, the class of metaphorically used words was proportionally different in the speech of the two cohorts: the lecturers used verbs metaphorically far more frequently in their speech than the students, while the student figures reflected a much greater use of metaphorically used prepositions than words of other classes. Interestingly, both groups of speakers used a similar proportion of nominal metaphors, a finding which deserves a closer look in other corpora in order to determine if the preference for nominal as opposed to verbal metaphors is a feature of L2 speech generally or is peculiar to the Spanish undergraduate students recorded in EuroCoAT.

Although Pitzl (2018) has noted many instances of speakers using English idioms in ELF interactions (albeit in modified or non-canonical forms), it remains unclear to what extent conventional English idioms are produced by L2 speakers in face-to-face conversation. Pitzl (2018) did not quantify the examples she found and the search for a random selection of English idioms in the VOICE corpus, described in Section 5, returned no hits at all. In contrast, other types of phraseological metaphors ('go/come back to something', 'on the one/other hand', or others with 'view') were used relatively frequently by participants, although the form of these phrases sometimes did not exactly reproduce the standard forms used by L1 speakers of English. L2 speakers may depart from L1 norms by omitting or inserting different functions words such as prepositions or articles ('one hand' or 'come back at', for example), a hardly surprising finding given that L2 speakers often block certain parts of the language they hear, ignoring phonologically reduced functions words such as these (N.C. Ellis, 2006). Inexact repetitions of target language forms may fossilise in L2 speech, giving rise to particular kinds of variations not found in L1 speaker discourse.

However, phonologically reduced function words such as prepositions are not the only elements in a conventional MWU that may be altered in the utterances of L2 speakers. Pitzl (2018, pp. 106–122) devotes a great deal of discussion to the lexical substitutions she found in VOICE (e.g. 'to my head' instead of 'to my mind'

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or 'the ball is in your corner' instead of 'the ball is in your court'). I have described two instances of this kind ('headline/guideline' and 'coal print/carbon footprint'), which I attribute to the speakers using a semantically or phonologically similar word instead of the target word, when they are unable to remember the exact form of an English metaphor they have heard. Nevertheless, it seems likely that there will be other alternative reasons for these kinds of lexical substitutions, such as L1 transfer. It is an area of L2 speaker metaphor production that is worth examining more closely.

Despite the presence of unusual wordings of conventional metaphors in their speech, we have seen that L2 speakers use these phraseological metaphors in ways identical to their L1 counterparts. When they use phrases such as 'come/go back to something' in order to organise their discourse, this replicates one of the functions found for metaphor by Low et al. (2008) when analysing university lectures. Likewise, although there is no evidence of the kind of metaphor shifting found by Cameron et al. (2010) involving lexical substitutions or contrasting metaphors across turns, usage of the same metaphor vehicles ('rock bottom', 'puppy' or 'lego') by the same or different speakers across turns reveals a certain kind of systematicity that may, in the long term, lead to the entrenchment of particular metaphors (e.g. 'rock bottoms') in certain L2 discourse communities. The role of English as a vehicle of international communication and as the *lingua franca* in many workplaces (e.g. the use of English in an international company in Germany that employs many people from abroad) is likely to give rise to many new metaphorical formulations, which start life as *ad hoc* formulations to meet an immediate communicative need (the temporary conceptual pacts described by Brennan and Clark [1996]) but which through repetition in different verbal interactions become the preferred way of referring to something among a limited group of speakers. This hypothesis can only be tested in much larger and more dynamic corpora than those available to researchers at present. However, if the corpora of ELF spoken interactions continue to grow, it should be possible to test this hypothesis and discover a great deal more about the kind of metaphors L2 speakers use and how they are different or similar to those used by L1 speakers of English.

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Figurative production in a computer-mediated discussion forum

Metaphors about relationship abuse

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When people undergo traumatic events, they frequently turn to metaphor in an attempt to make what might initially seem indescribable into something comprehensible to others, and/or to help themselves reach a clearer understanding of what has happened to them. This investigation explores such metaphorical language produced in computer-mediated discourse by survivors of relationship abuse to communicate about various aspects of their experience, thus shedding light on a traditionally "taboo" subject that many people find difficult to broach. The analysis first explores the ways survivors "frame" their experience through a particular source domain, and then looks at the various source domain "scenarios" that are drawn upon to elaborate particular salient details of the abuse. The chapter thus builds upon established theories about metaphorical frames and scenarios to explore what we may learn about a particular group (i.e. relationship abuse survivors) through analyzing their production of metaphor. In this way, it demonstrates why the theory of metaphor and the field of figurative language production matter in the real world.

Keywords: metaphorical analogies, relationship abuse, computer-mediated discourse, frames, scenarios

1. Introduction

When people undergo traumatic events, they frequently turn to metaphor in an attempt to make what might initially seem indescribable into something comprehensible to others, and/or to help themselves reach a clearer understanding of what has happened to them. This investigation explores such metaphorical language produced in computer-mediated discourse by survivors of relationship abuse to communicate about various aspects of their experience, thus shedding light on a traditionally "taboo" subject that many people find difficult to broach. The specific

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linguistic focus here consists of metaphorical analogies that these survivors use in online discussion forums to discuss their abuse experience. The topics they write about include their perceptions of themselves and their own emotions, survivors generally, their abusers and/or abusers in general, and the healing process. Moreover, they frequently discuss key moments in abusive relationships: for example, the "moment of realization" when they finally felt they understood the true nature of the abuser, the "discard" when the abuser broke off the relationship, the practice of "hoovering" when an abuser attempts to reestablish contact and "suck" the selected victim back into a cycle of abuse, and/or the establishment and maintenance of "No Contact" (NC) as a crucial step of recovery. Further, the survivors sometimes try to explain the world from the perspective of the abuser.

The present analysis first explores the ways survivors "frame" their experience through a particular source domain, and then looks at the various source domain "scenarios" that are drawn upon to elaborate particular salient details of the abuse. The analysis also discusses the ways in which survivors react to and negotiate metaphorical scenarios and frames among themselves in the discussion forum threads. Following this introduction, the chapter continues in Section 2 by setting the scene through presenting background information about metaphor, frames and scenarios. Section 3 continues by giving an overview both of the primary material under investigation (Section 3.1) and the methods used to identify and analyze metaphorical analogies (Section 3.2). The discussion then moves on to explore the findings, first with regard to frames (Section 4.1), selected scenarios (Section 4.2), and the negotiation among posters as they try to reach an understanding of their experiences with relationship abuse (Section 4.3). Finally, Section 5 presents concluding thoughts.

The chapter is grounded in the Conceptual Metaphor Theory (CMT), and builds upon established theories about metaphorical frames and scenarios to explore what we can learn about a particular group (i.e. relationship abuse survivors) through analyzing their production of metaphor. In this way, it demonstrates why the theory of metaphor and the field of figurative language production matter in the real world. The discussion is rich with examples from the data, to provide readers with greater insight into the dynamics of the forum.

2. Background: Metaphor, frames and scenarios

Metaphor is commonly used to discuss abstract, complex ideas in terms of more concrete entities, whereby certain real or perceived qualities from a (typically concrete) "source" domain are mapped onto a (typically abstract) "target" domain (see e.g. Lakoff & Johnson, 1980). An example could be when the process

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of recovery from abuse (the target) is discussed in terms of a physical journey (the source). Cognitive linguists who adhere to some version of the CMT maintain that the metaphors we use in language offer evidence about how we actually conceive of the world around us. When it comes to traumatic events in our lives, "[m]etaphors can help people to talk about difficult, emotionally intense or uncommon experiences, and thus, according to the conceptual metaphor theory, to think about them" (Deignan, 2010, pp. 53–54). Metaphor has been found to naturally lend itself as a resource when people are attempting to share, explain or make sense of highly emotional, distressing events (see e.g. Cameron, 2011; Demjén, 2016; Kövecses, 2000; Semino et al., 2017). Systematic analysis of metaphors used in authentic computer-mediated discourse may therefore provide increased insight into the attitudes and experiences of relationship abuse survivors.

Any particular target domain may be "framed" in different ways (see e.g. Semino & Demjén, 2018). This means that a target domain may be understood in more than a single way. As Entman explains, "to frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem, definition, causal interpretation, moral evaluation and/or treatment recommendation for the item described" (Entman, 1993, p. 52). The source domain used to shed light on a particular topic domain may seriously affect the overall messages conveyed, including emotional connotations and details about participants and actions. Such frames have the potential for impacting people's reasoning, with important consequences for their subsequent attitudes and beliefs (see e.g. Steen et al., 2014 for discussion of possible metaphor framing effects).

Source domains, in turn, typically have varied structural aspects that may be called upon to highlight different aspects of a target domain. Musolff (2016, p. 30) writes about this in terms of alternative metaphorical "scenarios", which he defines as "a set of assumptions made by competent members of a discourse community about the prototypical elements of a concept, that is, participants, "dramatic" storylines and default outcomes, as well as ethical evaluations of these elements, which are connected to the social attitudes and emotional stances that are prevalent in the respective discourse community". Such assumptions are structurally mapped onto a target domain through metaphor. Musolff illustrates this process with the source domain of marriage, which has a number of varying scenarios: courtship, engagement, wedding, honeymoon, parenting, separation, divorce, etc. While the ontological structure of any of these scenarios could be mapped onto his particular research interest of EU political relations, each carries different entailments and thus different implications. Musolff maintains that not only do such scenarios allow people to map source to target concepts, they also allow for the building of narrative framing for the conceptualization of the issues in

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question. In other words, they provide the foundation for frames that a particular discourse community may avail itself of to describe a particular abstract phenomenon (Musolff, 2006, p. 36).

3. Material and methods

This section first introduces and describes the material used as the primary data for the present investigation. It then goes on to discuss the methods used for extracting metaphors from the data, as well as those employed for determining the underlying frames and scenarios of each instance.

3.1 Primary data

The empirical data for this investigation consists of the metaphorical language produced between 2009 and 2015 in a publicly available online discussion forum for anonymous posters, accessible without password protection. The forum allows survivors of relationship abuse to start and/or respond to threads about their ongoing or past experience in an abusive relationship by posting messages under one of four general topics: "welcome", "journey", "families", and "male survivors". The present investigation explores the discourse in the two most productive of these general topics, that is, the "welcome" threads where newcomers typically introduce themselves and their stories and the "journey" threads where users post about varying aspects of their experience. The data consists of a total of 46 million words of text.

The relationships discussed most frequently involve a love partner: a spouse, a live-in partner, or a boyfriend/girlfriend. Posters discuss both heterosexual and homosexual relationships which have lasted anywhere from weeks to decades, and may still be ongoing. One factor common to many of these stories is infidelity on the part of the abuser, usually long-term and sometimes with multiple partners. Other abusive relationships discussed concern family members (usually parents, siblings, or children), colleagues, and/or platonic friends. The abuse under discussion is always emotional and verbal, a common form being "gaslighting" where a person is manipulated into questioning his/her own feelings or sanity. This type of abuse, however, often occurs together with other forms of domestic violence such as physical, sexual, digital and/or financial abuse. All of these topics appear in the forum.

The forum language is English, but the posters are from around the world; although strictly enforced forum rules prohibit posters from revealing identifying information, some indicate that English is not their first language. These threads

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thus instantiate a practical example of English as a Lingua Franca, a forum where English is used as the language of communication between speakers with different first languages. The 46 million words under investigation here comprise a total of 4042 threads, consisting of 302,793 entries produced by 4561 individual posters.

3.2 Identification and analytical procedures

It would be extremely time-consuming to extract metaphors by reading manually through a multi-million-word corpus. This investigation therefore focuses on a single explicit textual marker of metaphor: the use of the lexeme ANALOGY, i.e. the words *analogy* and *analogies*. Not only does its use more or less unambiguously flag metaphor, it also has the added benefit of being easily searchable in a corpus. It should however be recognized that this type of focused search does not allow for the identification of *all* metaphors in the corpus (nor even all metaphorical analogies), since metaphors may lack any specific lexical markers at all, or be flagged by other markers. Goatly (2011, pp. 178–209), for example, suggests a number of other potential flags of metaphor, such as the use of other explicit markers (e.g. *metaphor/-ically*), intensifiers (e.g. *literally*), copular or clausal similes (e.g. *like, as if*), and orthography (e.g. scare quotes). The lexeme ANALOGY is thus but one of a number of lexical markers that may flag metaphor in discourse, one of many possible access words providing an entry point into the vast amount of available data.

The appearance of the lexeme ANALOGY functions as an alert to the presence of an analogy, that is usually (but not always) in close proximity to that lexeme. Any retrieved concordance line and its immediate co-text may, however, only *refer* to the analogy in question rather than contain it. Identifying the analogies therefore required returning to the original text. By way of example, consider the concordance lines in sentences (1) and (2).

(1) Here's the *toaster analogy* that we frequently use.[1]

(2) I absolutely agree with your *train analogy*.

In Example (1), the poster prefaces her entry by overtly stating that she is introducing an analogy, which she then immediately goes on to detail (presented in Example (3) further on in this section).[2] Example (2), by contrast, comprises a

1. Note that all illustrative examples from the data are reproduced with the original spelling, punctuation and grammar.

2. This chapter refers to survivors as female and abusers as male, because this is the prototypical pattern in relationship abuse. This decision, however, is not intended to deny that there are both male and female survivors, just as there are male and female abusers.

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poster's response to an analogy that had been introduced earlier in the thread by someone else. Identifying the source entry containing the actual analogy with which the writer of (2) agreed therefore required skimming through the relevant thread (see Example (4) further on). Note that 38 observed instances of the lexeme were discarded from further analysis, because a poster had used the term inappropriately when there was no analogy, because the original analogy could simply not be located, or because the analogy was literal rather than metaphorical. Unlike metaphorical analogies, literal analogies involve similarity within a single semantic domain rather than between two domains, as in a comparison between a spectrum of psychopathy and a spectrum of autism (see Glucksberg & McGlone, 1999, p. 1542).

The next procedural step involved determination of the general frame for each identified analogy. Each such comparison was first given a brief "label" summing up its main contents, i.e. "the *X* analogy". In many cases, this label came directly from one of the discourse participants and was thus retrievable from the thread, as we see with the "toaster" and "train" analogies in examples (1) and (2) respectively. In the absence of any such summation by a discourse participant, I provided the referential labels. In the majority of cases, the selected word or phrase for the label was immediately recoverable from the text, in order to be as true to the original analogy as possible.

Assignment of each frame and scenario was accomplished through semantic annotation of the analogy labels, using the Wmatrix software tool (Rayson, 2009). Among other features, Wmatrix provides a web interface to the UCREL Semantic Annotation System (USAS), a framework for automatic semantic annotation of uploaded texts. For every word in a given text, USAS provides a default semantic tag that reflects the most likely category for that word, based on a general English language ontology (see Koller et al., 2008 for more background information about USAS). The USAS semantic tagset employs a multi-tier structure based on 21 major discourse fields, presented in Figure 1 (retrieved from Archer et al., 2002, p. 2;). The discourse fields are also further subdivided into a total of 232 more finely-grained categories.[3]

The present investigation equates frames with the USAS major discourse fields and scenarios with the subdivisions, thereby permitting a possible 21 frames and 232 scenarios. As an example, the "toaster" label from Example (1) was tagged by USAS as F1, meaning that it falls into the discourse field/frame of "F: food and farming", subdivision/scenario "1: food". By contrast, "train" in Example (2) was tagged M3, belonging to the discourse field/frame of "M: movement, location,

3. A complete list of the USAS subcategories is located here: http://stig.lancs.ac.uk/wmatrix3/semtags.html.

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travel and transport", subdivision/scenario "3: vehicles and transport on land". Note that by the method employed here, Musolff's "marriage" frame discussed in Section 2 would have been coded as the "S: social actions, states and processes" frame and "4: kin" scenario.

A general and abstract terms	**B** the body and the individual	**C** arts and crafts	**E** emotion
F food and farming	**G** government and public	**H** architecture, housing and the home	**I** money and commerce in industry
K entertainment, sports and games	**L** life and living things	**M** movement, location, travel and transport	**N** numbers and measurement
O substances, materials, objects and equipment	**P** education	**Q** language and communication	**S** social actions, states and processes
T Time	**W** world and the environment	**X** psychological actions, states and processes	**Y** science and technology
Z names and grammar			

Figure 1. USAS major discourse fields

Although Wmatrix has been successfully employed in earlier metaphor research, its primary use has thus far been as an aid in *identifying* linguistic metaphors and/or key semantic domains in discourse (see e.g. Demmen et al., 2015; Koller et al., 2008), rather than as a means of assigning frames and scenarios of *already identified* metaphors. The extension of the use of automated semantic annotation employed here is thus intended as a valid and transparent means of identifying the most likely frame and scenario of a given metaphor, allowing for greater replication than would a more intuitive categorization.[4]

Following the assignment of frames and scenarios, the correspondences between the various elements expressed in the analogy and the various elements in the abuse experience were fleshed out, along with any overall message. In the

4. Replication data for this chapter is located at https://dataverse.no/. This includes the full context for the metaphors included in the data, along with the selected keywords, USAS codes and all other analysis codes, as well as the R code (R Core Team, 2017) written for the quantitative data and creation of the table in Figure 2.

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"toaster" metaphor (continued in Example (3) below), the toaster corresponds to the abuse victim, the toaster's owner/user corresponds to the abuser, and the implication is that abusers have a purely instrumental view of their victims: they are not worth much effort when problems arise, and easily replaceable.

(3) Try to imagine another person as a toaster. It has a function. You plug it in and it does what you want it to do. You put it away when you aren't using it. You don't think about that toaster if you don't need it. If it stops working for you, you toss it in the trash go get another one. The real problem for them is that you require some serious work on their part to be sucked into being the toaster.

(4) You have a runaway train with CD [cognitive dissonance]. Stop the train before it does more damage, then later, go figure out how it got loose.

The "train" analogy which is the topic of Example (2), by contrast, highlights a different aspect of the abuse experience; see Example (4). The topic here is cognitive dissonance (CD), the mental stress caused by holding two contradictory beliefs at the same time. This is common among survivors of abuse, especially in the initial stages of recovery, as they try to come to terms with the stark contrast between two equally real perceptions of the same person: for instance, the positive yet ultimately false image of the person they fell in love with versus the manipulative betrayer s/he actually turned out to be. In Example (4), a runaway train corresponds to the state of CD – something uncontrollable, disempowering and, for the time being, inexplicable. The implication, offered as advice, is that taking control and resolving the CD should be the first order of business before trying to ascertain the underlying causes of that CD.

The nature of discussion forum threads, with back and forth communication between any number of participants, also allows for investigation into how survivors react to, accept, expand, and/or reject the metaphorical comparisons advanced by members of the discourse community. This final stage in the present investigation was carried out through exploration of the discussion among posters subsequent to the introduction of each identified analogy to evaluate how they negotiate a given analogy, seen in the light of their own understanding and experience with abuse.

4. Findings

In the 46 million words in the corpus, there are 596 occurrences where the lexeme ANALOGY, usually in the singular form *analogy*, signals metaphorical comparison. These are distributed in 413 of the 4042 threads under investigation, and were written by 358 of the 4561 individuals who contributed to those threads. The occurrences thus involve slightly more than 10% of the threads in the corpus and

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roughly 8% of all posters. Keeping in mind that any one thread involves interaction among more posters than just those who actually produced text employing the lexeme ANALOGY, the 8% figure clearly represents no more than a minimum figure of those whose discussion touched on a metaphorical analogy.

Some of these 596 occurrences refer to a single metaphor, because the word *analogy* sometimes appears in different entries within a single thread to refer to the same analogy. Excluding such overlap results in a total of 503 individual metaphors flagged by the lexeme. In 216 of these analogies, it is the producer of the metaphor who has explicitly introduced it as an analogy in a "my analogy for *X* is" form, as in the "toaster" metaphor from examples (1) and (3). The remaining 287 metaphorical analogies are marked as such in a response following some variation on a "my opinion of your *X* analogy" form, as in the "train" metaphor from examples (2) and (4). Further, some individuals are responsible for the creation of more than one marked metaphorical analogy; the 503 individual analogies were produced by 311 different posters. The overall picture is thus quite complex. The following sections explore this complexity by discussion three separate, albeit related aspects: the selected frames (Section 4.1), selected scenarios (Section 4.2), and the function of the analogies and responses to them in the discussion threads as survivors attempt to negotiate both individual and collective understandings of their trauma and its aftermath (Section 4.3).

4.1 Frames

Figure 2 presents the distribution of the 503 observed occurrences of individual metaphorical analogies, divided across frames, corresponding to the USAS discourse fields. The bars are arranged in order from the least to most frequent frame.

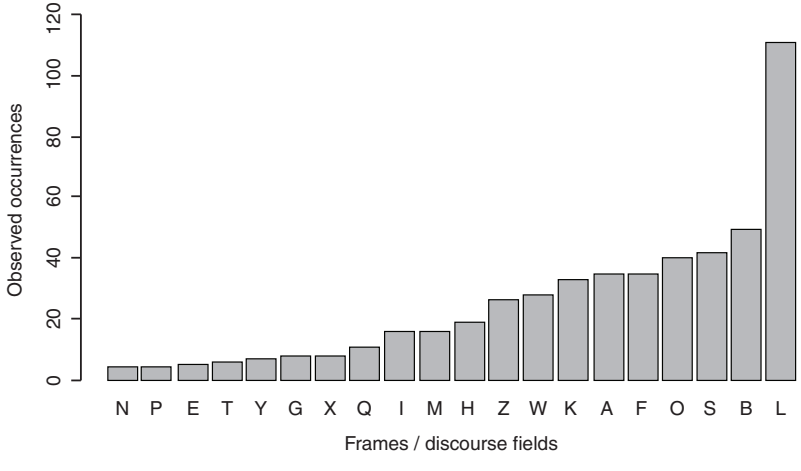


Figure 2. Observed occurrences of 503 individual metaphorical analogies per frame

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Perhaps unsurprisingly, there is no single means of dealing with the topic of relationship abuse. All of the 21 USAS major discourse fields appear to varying extents, with the exception of "C: arts and crafts". Table 1 shows illustrative examples from the corpus of each frame, presented in order from the most to the least frequent frames. The numbering for the examples follows in sequence from the previously numbered examples in this chapter, and the key words and phrases employed for the referential labels semantically annotated by USAS are italicized. The final column lists the particular scenario assigned to the given example, useful to make sense of the assignment of any given term to a particular frame.

Table 1. Illustrative examples of each frame

Code	Frame	Numbered example		Scenario
L	Life and living things	(5)	You can't expect a person that has no capacity for love, empathy, or remorse to understand what those emotions feel like – to do so would be tantamount to expecting a *Great White Shark* to feel bad for eating that cute fuzzy seal pup. They do it because that's what they do. They don't feel bad about hurting you. […] Understanding the nature of the predator can and will help you to come to terms with leaving this creature behind- that and a whole lot of support.	L2 Living creatures: animals, birds, etc.
O	Substances, materials, objects and equipment	(6)	Did you ever have one of those *alarm clocks* that starts off quiet and then gets loud? It gets louder so gradually you don't notice it until it's really loud, but if it went off at half-blast it would startle you awake instantly. I think it's like that only they get shittier instead of louder. Year 4 shit in year 1, he's gone. Year 4 shit after year 3, not so startling.	O2 Objects generally
B	The body and the individual	(7)	Sometimes I think I've almost accepted it, then I have dream that wakes me up in a cold sweat. I do feel like a *drug addict* going thru withdrawls. That is a good analogy … I am a drug addict.	B2- Disease
S	Social actions, states and processes	(8)	Thats what he always was trying: scare me, boss me and make me feel guilty I felt like being expected to be some kind of newborn *Jesus Christ*, being crucified for some one elses sins.	S9 Religion and the supernatural

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Table 1. (*Continued*)

Code	Frame	Numbered example	Scenario
A	General and abstract terms	(9) These folks set up the lake with the *thin ice*, then blame us for crashing through. Don't play that game.	A15- Danger
F	Food and farming	(10) I sound pretty selfish by saying that, but I felt like his compliments were empty. More *crumbs* than anything.	F1- Lack of food
K	Entertainment, sports and games	(11) Ex wife number 1 used this analogy: "He's like a child with a *toy*. You're one of his favorite toys, but he's bored. He's tired of playing with you right now because he has a brand new toy that he wants to show off to everyone. That new toy is all he can think about right now. He didn't donate you or give you away though. He just put you on the shelf until he's ready to play with you again."	K6 Children's games and toys
Z	Names and grammar	(12) Think of The *Wizard Of Oz* – "I am the great and powerful Oz!!!!" In the end, in reality, he was just a man. No magic, no real power. Just a bunch of smoke and mirrors. When the curtain is pulled back the reality is revealed.	Z3 Other proper names
W	World and the environment	(13) There's a range of emotions that are an inevitable part of healing; they come thru when we're strong enough to handle them. And they're like *waves on the ocean*, they come again & again till we get thru them, but we do; the best we can.	W3 Geographical terms
H	Architecture, housing and the home	(14) I'm slowly building up an impenetrable *brick wall*, probably not a good thing but I'm safeguarding myself from getting hurt again.	H2 Parts of buildings
I	Money and commerce in industry	(15) As to why she wont leave you alone, to her you are a nice *$20 bill* in the street. She will find it worthwhile to chase it down and pocket it if she can.	I1 Money generally

(*Continued*)

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Table 1. (*Continued*)

Code	Frame	Numbered example	Scenario
M	Movement, location, travel and transport	(16) Remember the *air crash* analogy – where you have to put your own mask on first before you think of helping anyone else. Well you're still in the plane and you still need the oxygen. You can't afford to pass it over to someone else yet – you have to put yourself first.	M5 Flying and aircraft
Q	Language and communication	(17) If they think of everything intellectually perhaps I was a *library book* to distract him from his life for a set period of time, he always knew he was going to take the book back and never read it again.	Q1.2 Speech: Communicative
X	Psychological actions, states and processes	(18) Full it felt like a trance for me too. like i was *hypnotized* by a hypnoseducer.	X2 Mental actions and processes
T	Time	(19) It is like *morning*, when Sun wakes up and we impatiently wait for it to come up and shine warm on us. In impatience we forget to enjoy the arrival of a new day, but we want warmth and midday now… This is the morning of our life, and i wish us all to find trust and patience to live it fully	T1.2 Time: Momentary
G	Government and public	(20) I feel like I just got out of *jail.*	G1.2 Law and order
Y	Science and technology	(21) They've "installed" a kind of *softwar*e in our heads that make us work like that for a while, until we "uninstall" that. Like with an old computer, uninstalling a heavy program takes a LONG time. In fact, it's more like an *operative system*, and those take time to uninstall after an infection, and they take even longer to reinstall when we decide which memories to forget and which ones to keep. Hm. Guess I'm in analogy mode today.	Y2 Information technology and computing
77N	Numbers and measurement	(22) The best analogy I heard for the holidays is that its like a *magnifying glass* -- you look more carefully at what's in your life and also what's missing.	N3.2+ Size: Big

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Table 1. (*Continued*)

Code	Frame	Numbered example	Scenario
E	Emotion	(23) I hate him with the *force* of a supernova.	E3- Violent: Angry
P	Education	(24) A psychic I saw a couple of times used this analogy once when I was talking about how much crap I have had to deal with in my lifetime. She said that in life some people drop of out school in 8th grade, some go on to college, some obtain *PhD*… in my spiritual journey during this lifetime, I am in the PhD category, meaning I am learning a lot in this round….	P1 Education in general
C	Arts and crafts	NONE	NONE

The most common frame is "L: life and living things", where nearly all instances have been coded with the "L2: living creatures: animals, birds, etc." scenario. Survivors most often describe their abuser in terms of an animal, as in the "Great White Shark" in Example (5) from Table 1. Such an analogy, where the innate nature of an abuser is likened to that of a deadly predator, is frequently advanced either as an explanation for the otherwise seemingly inexplicable behavior of the abuser, or to offer advice – that is, there is no point in reconciliation with such a person, as they will naturally and ruthlessly turn on you at some point.

Further analogies belonging to the L2 scenario with this identical theme are readily found in the corpus, e.g. as variants of Aesop's "The farmer and the viper" fable involving unavoidable betrayal committed by remorseless creatures. An example is the "snake and man" analogy in (25):

(25) A friend actually gave me a good analogy about that the other day. A man climbing a mountain path comes across a snake. The snake asks the man for a ride to the top of the mountain. The man says "but you are a snake and you will bite me." The snake says "no, if you give me a ride to the top of the mountain I will be grateful and will not bite you." So the man puts the snake on his shoulder and climbs the mountain. At the top the man reaches up and grabs the snake to put him down and the snake bites him. The man says "you promised you would not bite me" and the snake says "yes, but I am a snake". Substitute abuser for snake and you can see that no matter WHAT they say and what you do, in the end they ARE an abuser and they will behave accordingly. They ride on us to the top of the mountain and when they get what they want they bite/discard us and move on.

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The tale of the scorpion and the frog, a more well-known variant of the Aesop fable, also appears in the corpus. Here, a frog agrees to carry a scorpion across the river on its back, in return for reassurances that the scorpion will not sting him; halfway across the river, the scorpion breaks his promise and stings the frog, killing it. When asked the reason for his betrayal, the scorpion simply replies, "It's my nature". While the exact species of the perpetrator in the animal analogies may thus vary, the events frequently parallel each other and the lessons remain constant. Such similarities do not escape unnoticed by the forum posters, who find reassurance from the correspondence between stories, as they provide some sort of explanation for the abuse. We read about just such relief in the poster's statement in (26).

(26) Count me among those who are amazed at the repeat of almost the same story, with altered details making them differ. It is comforting, oddly, to learn that they are a type of creature, and that it wasn't really me who was at fault for things going so badly for so long, it really was HIM.

One thread in particular is devoted entirely to the perceived similarities between abusers and living creatures, a focus triggered by the title chosen by the thread originator: "Which animal or creature describes your abuser". Table 2 presents the interaction pattern among the discussion participants, which mainly consists of a direct chain of replies with each person offering their choice of animal best suited to represent their abuser. Most, though not all, posters offer reasons for their selection. As an example, the explained rationale for the choice of cuckoo bird in post 10 is that these birds leave their eggs in another bird's nest and have the "victim bird" raise the young. This same poster then suggests the condor as an alternative suggestion: a bird of prey, "distant and uncaring, predatorial and silent". In addition to a simple chain, however, the interaction patterns also shows some forks, where a particular message generates one or more specific replies; we see this after posts 5, 17 and 21.[5]

Although most users posted only once, a few posted two or three times in response to someone else's suggestion. All told, this thread generated 29 entries (indicated by the "Post" column) written by 21 individual participants (indicated by the "Poster" column). Here we see that abusers are compared to vicious predators (e.g. *wolf, shark*), poisonous creatures (e.g. *snake, scorpion*), monsters (e.g. *demon, vampire*), and parasites (e.g. *maggot, tapeworm*).

5. The entire text from this thread is available as supplementary data to this chapter at https://dataverse.no/.

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Table 2. Interaction pattern for thread "Which animal or creature describes your abuser"

Post	Poster	Creature *or* function
1	1	Introduces the question corresponding to the thread title
2	2	maggot
3	3	wolf
4	4	blob fish
5	5	demon (also turd)
6	4	– reply to Post 5 (Coprolite)
7	6	vampire, piranha, wolf in sheep's clothing or anything else hideous I can think of
8	7	demonic troll (also twatwaffle)
9	8	tapeworm
10	9	cuckoo bird or condor
11	10	the human butterfly larvae, also known as Dermotobia hominis
12	11	snake
13	12	The Toad
14	13	snake
15	14	wolf, vampire
16	15	vampire bat
17	16	amoeba
18	13	– reply to Post 17
19	15	– reply to Post 18
20	2	– response to all participants: maggot
21	17	snake, wolf, cockroach
22	13	– reply to Post 21: chocolate covered roaches
23	18	snake
24	17	– reply to Post 22: roach
25	**18**	– **reply to Post 24 ANALOGY**: roach
26	17	– reply to Post 25: roach
27	18	scorpion
28	20	shark
29	21	mosquito

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Note that this particular thread appeared in the retrieved data due to post 25 (in bold font), because it includes the search term ANALOGY. Here, poster 18 specifically compliments the analogy in post 24 by writing "lol great analogy" by way of complimenting poster 17's comparison of the abuser's fear of exposure to the flight reaction of a cockroach when the light is turned on. Had the thread closed before that point, it would not have appeared as part of the analyzed material because most of the metaphorical analogies are unmarked by explicit lexical flags of any sort. Table 2 therefore serves to as a reminder that there are a great number of metaphors in the corpus beyond those specifically identified through reliance on a single lexeme as an entry point into the data.

Survivors also use animal analogies to talk about the relation between abusers and their victims, as in Example (27) with a cat/mouse analogy, involving the dual entailments of abusers as predators and survivors as prey. In addition, survivors employ animal comparisons to describe themselves in the post-relationship phases. In Example (28), for instance, we read a survivor's description of her fragility and vulnerability in the wake of betrayal. More common in the data, however, are cases such as that illustrated by Example (29), where a survivor describes different stages of the healing process in terms of the transformation from caterpillar to butterfly. The "Phoenix rising" analogy also appears in the data as a means of referring to survivors in the recovery process, indicative of the feeling of empowerment after their tribulations.

(27) They are just predators. A cat, pushing the half dead mouse a bit more around to see if there's any more entertainment left there.

(28) I have never been this fragile before. All of my armour is gone. I am a turtle without a shell and my shell is gone forever. I will never be the same.

(29) The only analogy I can come up with is of a butterfly hatching out onto the leaf where its chrysalis has lain, seemingly dormant. Yet inside, so much has been happening. Some of us are still in the chrysalis, still transforming. Others are just beginning to emerge; still others have left the chrysalis and are drying their new wings in the sun, ready for flight. None of us are caterpillars anymore….all of us are impatient for flight, but we're not all at that stage yet. When we've gone through the metamorphosis, we will be – we just have to keep moving forward. Time does the rest.

Another analogy that appears repeatedly throughout the corpus to explain why anyone would stay so long in an abusive relationship is that of the "frog in boiling water", illustrated in examples (30) and (31).

(30) It's like that frog on boiling water analogy. If I had known how toxic and abusive he was from the beginning, I would have ran, fast and far immediately. But just like the frog put in lukewarm water – it will boil alive to its own demise when the heat is ever so slowly turned up.

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(31) I remind myself of the frog in boiling water analogy and thank my lucky stars that I got out of it wiser.

The poster in Example (30) first mentions the analogy and then elaborates upon the details, the comparison being that abuse escalates so slowly that the victim does not even realize she is in danger until the situation is truly precarious. What is notable about Example (31) is that the poster merely mentions the analogy without explaining it; she thus ostensibly presumes that the underlying meaning has become part of the jargon of the discourse community to such an extent that no elaboration is required.

We find a parallel analogy in the "alarm clock" example in (6) from Table 1, including as it does a similar message about the gradually increasing scope and nature of abuse. This particular analogy adheres to the frame of "O: substances, materials, objects and equipment" rather than to the "L: life and living things" frame of the "frog" analogy. It therefore demonstrates how the same topic may be framed in different, yet appropriate and communicatively successful ways. We also see this phenomenon in cases where survivors discuss how abusers view their abused partners as some type of dispensable object that first captivates the abuser. But the abuser ultimately either breaks the object or grows weary of it and casts it aside, only to find a new one to replace it. In Example (3), previously cited in Section 3.2, that object is a toaster (from the "F: food and farming frame"). In (32), by contrast, the item in question is a household appliance (from the "O" frame, as with the alarm clock) – exciting at first, but easily and unemotionally replaced when broken.

(32) It helped me when I read something about how the abuser loved us--kind of like how we love when we get a new washing machine or refridgerator or whatever. At first, we absolutely love it! It washes our clothes so well! It's so useful! It's shiny and bright and new. However, in time, we don't really think of it as anything special anymore--it's just there. And then it breaks, and we replace it with a new model. And we don't feel bad getting rid of the old one, it doesn't work for us anymore.

In Example (11) from Table 1, the object representing survivors is a toy that is merely put aside for use at a later time, rather than being completely discarded; analogies involving toys belong to the "K: entertainment, sports and games" frame, which includes a subcategory/scenario for children's games and toys. In a different thread, a separate poster in Example (33) adds a few other entailments to the "toy" scenario: the toy is not supposed to repair itself, and it becomes momentarily interesting again if someone else is attracted to it. The two examples together demonstrate how posters may focus on different facets of the same scenario to highlight alternative, yet related aspects of the abuse experience.

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(33) But the toy is always supposed to lay there where it was dropped. The toy is not supposed to crawl off and repaint and repair itself and find new kids to play with. So, the toddler expects always the toy to be lying there, for when the urge hits it to pick it up and ramble it to check if the toy is still playable. And if another kid dares to touch the old thrown away, forgotten toy then all of a sudden it becomes important to grab it back from the other kid and possess it once more, for a short time only, just to have the feeling it's still their possession.

Looking at some of the other examples in Table 1, we see that the "B: the body and the individual" frame is relatively frequent, mainly due to the prominence of analogies related to addiction, as in Example (7) where the attraction to an abuser is likened to a drug addiction. Other addictive substances mentioned include alcohol, cigarettes, tobacco and dopamine, as well as the activity of gambling. Posters sometimes draw comparisons between their feelings of longing for the abuser's attention with their past or present experiences of dealing with addictive substances and/or rehabilitation, such that their metaphorical analogies are grounded in personal physical experience.

In addition, references to popular culture are frequent, falling into the "Z: names and grammar" frame and exemplified in Table 1 by (12), where the abuser is compared to the Wizard of Oz – seemingly all-powerful and omniscient but later revealed as a fraud. The "Wizard of Oz" film is also the source for a term accepted into the jargon of the community and frequently used in analogies – that is, "flying monkeys" who are friends of the abuser/Wizard and do his bidding (and should be consequently be ignored and blocked during the recovery process). In addition to Oz, metaphors include references to fairy tales (e.g. Prince Charming, Beauty and the Beast, Bambi), fiction/fantasy films or series (e.g. the Terminator, the Daleks from "Doctor Who" and the Dementors from "Harry Potter"), together with a range of other genres (e.g. living with a tiger in "Life of Pi" and the sinking of the Titanic [do you go down with the ship or try to survive?]). And despite the serious topic, we find humor. One survivor compares herself to Sesame Street's Cookie Monster, who deserves the whole cookie rather than just crumbs. Another replies to a previous poster's analogy comparing her abuser to the Blob (of 1950s American science fiction/horror fame) with the ironically appropriate "freaky fact" in (34).

(34) Fun/freaky fact: The Blob was double billed with…… *drum roll*…… I married a monster from outer space, how's that for metaphors about abusers.

4.2 Selected scenarios

As discussed in Section 3.2, Wmatrix divides each major discourse field into one of 232 more finely-grained categories, equated here as the scenarios employed to communicate about survivors' experiences with abuse. To illustrate the richness

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of the data, both in terms of congruity and variation, this section delves more deeply into one of the observed frames – that of the "W: world and our environment", accounting for 28 observed metaphorical analogies in the data. Each of these analogies has been subdivided into one of six scenarios: Table 3 provides an overview of the six scenarios and the numbers of observed occurrences of each of them, together with referential labels for each instance.

Table 3. Scenarios for the "W: world and the environment" frame

Code	Scenario	Number of observed instances	Labels for observed instances
W1	the universe	3	*moon, globe*
W2	light	2	*light* (x2)
W2-	darkness	1	*darkness*
W3	geographical terms	15	*beach, boulder, cave, earthquake, iceberg, island, ocean* (x5), *pool, pothole, stream, waves*
W4	the weather	7	*cloud, fog, hurricane, tornado* (x3), *weather*
W5	green issues	1	*nature*

These 28 analogies were produced by 27 separate individuals, with one poster having created two of them (the "moon" analogy and one of the "ocean" analogies).

Further narrowing the focus, we see that seven of the 28 analogies fall into the "W4: weather" scenario, four of which discuss abuse in terms of a natural disaster. Three elaborate on a tornado analogy, all in independent threads; see (35) through (37). The fourth, cited in (38), selects a hurricane analogy.

(35) I think of them [abusers] kind of like *tornados*. They touch down and destroy everything in their path then disappear, we good people just happen to be the pretty red barn in the field they land in.

(36) In a blink of an eye we can loose all that we have – the psycho came through our lives much like a *tornado* showing no mercy on who they touched down on – but it is the love and volunteering of others much like this site and in our communities that pull victims together and get them back on their feet – How would we live without that love -we would be nothing but a tornado and a psychopath that only rips things apart.

(37) i like the analogy i read recently that said something to the effect of: "People survive *tornadoes* and large predator attacks, but you wouldn't want to go searching for one" in other words, you really don't want one back.

(38) My latest analogy for the abuser is, a *hurricane* came through and ripped the roof off my house – nothing I can do to change what happened, but I am in full control of my recovery.

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Both (35) and (36) are similar in that it is the abuser who is equated with a tornado, while the survivors are simply in the wrong place at the wrong time, the random and disempowered victims of indomitable and ruthless forces of nature. The comment in (36), however, is preceded by the poster's recounting of her then-current experience with an actual tornado that had just hit her local community. She describes the grief and shock among the people who had lost their homes and places of business, and – importantly – also the generosity and caring among those who were able to offer help and support. This image of solidarity in the face of inexplicable adversity adds a positive note to the analogy, missing in (35). This particular analogy is but one of 40 individual metaphors in the data that, according to the posters, derive from a literal experience rather than any hypothetical situation.

Examples (37) and (38), by contrast, focus on the recovery process. While Example (37) is the least specific of the four analogies in that no precise entailments are explained, it adds a parallel metaphor comparing an abuser to a predator and abuse to an attack: abusers are destructive, even deadly, and have no welcome role in our lives. The figurative hurricane in (38) plays the same disempowering role as the tornado in both (35) and (36), yet here the poster describes the subsequent reclaiming of her own sense of empowerment in even stronger terms than in (36): the helpless victim of a natural disaster becomes a determined survivor.

This same contrast between disempowered victim and empowered survivor in the wake of a natural catastrophe is explicitly discussed by another poster, in an analogy about earthquakes – also falling into the "W: world and our environment" frame, but categorized in the scenario of "W3: geographical terms" rather than "W4: weather". In Example (39), a poster brings up her therapist's analogy where the overall abuse experience (here, of childhood abuse) is compared to an earthquake.

(39) She gave me an analogy to state her position of total responsibility for choosing life's experiences.. Her words, "If someone finds themselves in an *earthquake*, that person chose the experience on some level."

By the logic of this therapist, no abuse survivor is a completely innocent victim of random events, contrary to the contention in the earlier tornado and hurricane analogies. Instead, we are all to some degree responsible for everything that befalls us (in the case of this analogy, perhaps by having deliberately chosen to live in an earthquake-prone area?). In a sense, this therapist's view is one of empowerment, for it should always be possible to actively change circumstances that are under our control. In this case, however, the poster adamantly rejects the implications of the therapist's metaphor; see (40).

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(40) I can not accept this belief system. If in an earthquake, i do not hold myself accountable for being the victim of an earthquake, but only my actions following my experience. How i cope with it. i am not responsible for childhood abuse, only my journey to heal from it. And i did not choose to be a victim of a disordered abuser. But I am responsible for healing from it, growing from this so i will not be targeted again.

This statement thus mirrors the view expressed in the hurricane analogy in (38), with the distinction between hapless victim and responsible survivor. In these scenarios, while the posters accept no blame for the abuse itself, they do accept responsibility for their reactions to the abuse – that is, for their "journey" in healing.

4.3 Negotiation among posters

There are two main functions of posts that include the words *analogy* or *analogies*: explanation and support. These two functions account for 215 and 339, respectively, of the 596 total observed posts that include the lexeme ANALOGY to refer to a metaphor. First, when posters introduce metaphorical analogies as explanation about some aspect(s) of abuse, metaphor relates either to an *individual* experience or to the *collective* experience. In Example (9) from Table 1, for instance, a poster writes about her own personal feelings by comparing her struggles in coming to terms with her partner's deception to a drug addict's withdrawal symptoms. In addition, posters sometimes suggest metaphorical explanatory analogies about someone else's individual experience, often by way of advice. Example (41) provides an example of such advice, where a poster offers another forum member an analogy between emotional abuse and physical illness, in the hope of promoting a new and helpful perspective about that person's struggles in the aftermath of an abusive relationship.

(41) Emotionally, its like your immune system being breached by an abuser virus that works against ourselves. Once that immune system is restored, it will not let that invader in again. Hope that analogy works for you!

Most often though, explanations in the corpus extend beyond a single person's experience or feelings, and instead describe the abuse experience in general terms. One example of this is Example (21) from Table 1, reproduced below and renumbered as (42) for the sake of convenience, where the poster first introduces and elaborates upon two related metaphors as a way to describe a facet of the collective experience of recovery and healing after relationship abuse.

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(42) They've "installed" a kind of software in our heads that make us work like that for a while, until we "uninstall" that. Like with an old computer, uninstalling a heavy program takes a LONG time. In fact, it's more like an operative system, and those take time to uninstall after an infection, and they take even longer to reinstall when we decide which memories to forget and which ones to keep. Hm. Guess I'm in analogy mode today.

Such explanatory analogies contribute towards a sense of group community and solidarity in the forum, important given the feelings of loneliness and isolation that many posters describe in their offline life where they feel they are often met with a lack of understanding about their situation.

Posts including the lexeme ANALOGY that function as support do so by overtly confirming that an analogy suggested by a previous poster resonates, as was evident with the "train" analogy in Examples (2) and (4). Maíz-Arévalo and Sánchez-Moya (2017) note this function in their work developing a taxonomy for support strategies in computer-mediated communication, where they explore practices in an Intimate Partner Violence online forum. They find that participants express support through showing approval (acceptance, compliment, agreement) or showing kindness (empathy, holding, urging). Although the present investigation has not analyzed all identified expressions of support following such a comprehensive taxonomy, similar characteristics are nevertheless readily recognizable in the material in focus here. In (43), for instance, the poster praises the "turtle" analogy from Example (28) and adds that it matches her own perceptions, a combined compliment/empathy strategy. The poster of Example (44) simply expresses her admiration (compliment strategy only), and then thanks the earlier poster for her "tornado" analogy (presented in Example (35)). Indeed, thanking previous posters for their analogies is common.

(43) Your analogy of a turtle without a shell is cute and I can certainly relate to it.

(44) thank you. I love your tornado red barn analogy!

All told, 167 of the ANALOGY observations function as "support only", in that posters somehow affirm a particular analogy, but then make no more mention of it. An additional 147 ANALOGY posts, however, first affirm a given metaphor and then present an alternative analogy (45), elaborate on additional entailments (46), and/or link the proposed analogy to their own experience (47).

(45) The fog lifting is a good analogy. Slowly waking from a bizarre dream is another.

(46) It's a great analogy. it's like with drug/alcohol addiction, abstinence is key – NC is like abstinence of the Psychos.

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(47) I'm with you on the brick wall analogy. Same for me. There's a few windows that I can look out from but nobody is getting in for the moment. It's a necessary process isn't it. We need somewhere safe to lick our wounds.

Example (45) first compliments a "W4: weather" metaphor about the first phases of the recovery process, and then suggests an alternative metaphor to describe the same post-relationship stage – a "dream" metaphor from the "X2: mental actions and processes" scenario. Example (46) also first compliments a metaphor offered by a previous poster who described her craving for attention from her abuser in terms of alcohol addiction, and then adds a further entailment by comparing "No Contact" (NC) to abstinence from alcohol. Finally, Example (47) – a response to the analogy in (14) from Table 1 where a survivor writes about "building up an impenetrable brick wall" as a safeguard measure – also first affirms the expressed metaphor (showing empathy), and then continues to both add entailments *and* relate it to her own situation.

The reception to proffered metaphors is thus overwhelmingly positive, fostering a supportive online community and contributing to a common understanding of the abuse situation that posters find validating. However, a small handful of posts with the word *analogy* function to criticize rather than support a given metaphor. Even these critical posts, however, tend to be respectful and even cautious; see (48) and (49).

(48) Hmm I personally would never insult any animal by comparing them to an abuser – sorry just not an analogy I would use.

(49) This is a great thread with really good posts. And I agree with your comment until this part. The analogy you are trying to make is plain wrong and offensive to parents and those persons on this site who work with children in their professional lives (teachers, therapists, psychiatrists, pediatricians, etc).

Polite correction is seen in Example (48) where the poster offers an apology even though she disagrees; even here, though, the posters are agreed in their low opinion of abusers – the issue at stake is over the proper measure of comparison. Example (49) shows the strongest criticism uncovered in the data, where the poster calls a comparison between abusers and fickle children with lack of impulse control "plain wrong and offensive". Yet even this condemnation is first softened through prefacing negative remarks with expressions of support, with a compliment followed by an expression of agreement.

Further expressions of criticism in the identified analogies are embedded within explanatory metaphors, and mainly consist of self-criticism. We see this in Example (50) comparing the abuser to a wall, which the poster herself feels is "not the best analogy". A further example begins with the "skunk" analogy in (51), a mixed metaphor.

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(50) It's like having an argument with a garden wall we can row till we're blue in the face. 'Wall' won't care. will 'wall' care if we don't speak to it in a while? 'Wall' doesn't even know we're there. We can't expect real emotions from a garden wall. because it's a wall. not the best analogy…

(51) I guess it opened up a can of worms that I wasn't prepared to….what does one do with a can of worms? If I was a skunk I could eat them.

The author who posted (51) adds an entry later on in the same thread, saying that when she woke up the next day, she "felt stupid for writing the can of worms and skunk thing [but] couldn't think how to edit it to make sense". Rather than prompting agreement about the inappropriateness of the "skunk" metaphor, however, this admission of self-criticism resulted in a number of supportive comments, such as Example (52) following a combined compliment/empathy strategy.

(52) I like your words about the can of worms. i have to say i enjoyed your analogy lol..caused an understanding nod and grin x

5. Conclusions

The present investigation demonstrates some of the myriad ways that survivors of relationship abuse employ metaphor to communicate about their experiences, through an analysis of all metaphors flagged by the lexeme ANALOGY in a 46-million-word corpus compiled from online discussion forum posts about the topic. While investigation of metaphors flagged by all potential metaphor markers in such a large corpus was beyond the scope of the present study, accessing the data through a single entry has proven fruitful. Future studies into metaphors marked by other flags might thus also prove equally valuable in shedding further light on the ways in which relationship abuse survivors employ metaphor to discuss their experiences and feelings, and by extension, about their underlying conceptual understandings about what they have gone through. Such studies could investigate, for instance, whether there are any qualitative or quantitative differences in the metaphors marked by different flags and/or in the reactions such metaphors prompt among the forum posters.

As for the findings in the present study, three points in particular stand out from the analysis of the co-text surrounding the 596 occurrences of ANALOGY identified in the material. First, there is immense variety in the selected frames: 20 of the 21 major discourse fields in the USAS semantic annotation scheme are represented in the data. That said, there are recognizable tendencies, with some frames being more frequent than others. For instance, the "L: life and living things" frame is by far the most common, providing a productive means of characterizing abusers and their actions. Moreover, we have seen how the same scene or experience may

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ostensibly be explained equally well through different frames, as when the gradually more encompassing nature of abuse is conceptualized as a frog in water that is slowly heated to the boiling point or alternatively, as a clock whose alarm starts off softly and gradually becomes shriller.

Second, posters also select a wide variety of scenarios to describe (parts of) their experience, even within the same frame. By way of example, all possible USAS subdivisions of the "W: world and the environment" frame were represented in the data. That fact notwithstanding, we also find a number of recurring scenarios, as when abuse is compared to a natural disaster, or when emotional turmoil is compared to ocean waves. As far as implications are concerned, the choice of frame and scenario may be meaningful. For example, how best to protect yourself from a tornado that randomly touches down may differ from how to protect yourself from a wolf actively hunting for prey.

An additional point of note is that almost one in five of the metaphorical analogies in this data are clearly rooted in a literal experience from which the poster draws overt comparisons. Sometimes that literal experience is one likely to have been encountered by most people, e.g. anyone who has been woken by an alarm clock. In other cases, however, the literal experience providing the source for an analogy is decidedly personal, e.g. a poster who compares her withdrawal symptoms from drugs to her longing for her abuser, or another poster drawing parallels between her experience having lived through a tornado and its consequences with having lived through an abusive relationship and its aftermath. Such cases demonstrate that metaphor is, in some sense, all around us and our actions, and may be "activated" at any time in completely different contexts.

Finally, despite such variety, most proposed analogies strike a positive chord with other members of the discourse community. Forum members frequently show their support for each other by complimenting posters for an analogy that particularly resonates. Only rarely is there dissent, even when alternative analogies are advanced. Such interaction forms part of the negotiation between survivors as they try to reach an understanding of their individual and/or collective experience. In short, the metaphorical analogies in discussions about abuse are highly adaptable and flexible. They serve to establish, further develop and reinforce a more complete understanding of trauma and recovery, both on an individual basis and on a collective basis.

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The production of time-related metaphors by people who have experienced pregnancy loss

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In this chapter we focus on the ways in which people who have experienced pregnancy loss use metaphor to describe the experience, with a particular focus on time-related metaphor. The data come from an ESRC-funded[1] study that investigates the ways in which people who have experienced bereavement following pregnancy loss communicate their experiences. We use these data to explore the ways in which the bereaved (and those who support them) use time-related metaphors to talk about their experiences and suggest ways in which such an analysis can be used to provide insight into the experiences of the bereaved. We conclude by discussing the implications of our findings for friends, colleagues and relatives.

Keywords: metaphor, time, emotion, grief, bereavement, pregnancy loss

1. Introduction

Bereavement following the death of a loved one is something that the vast majority of people will experience at some point during their lives. Grief following bereavement has been shown to be a complex and life-altering experience and people need support to get through it. In order to provide meaningful support, others need to have some insight into the way those affected are feeling. One way in which we can gain insights into the emotional landscape of the recently bereaved is by exploring the metaphors they use when talking about their feelings. Studies have

1. Economic and Social Research Council, ref: ES/N008359/1

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shown that when people experience difficult or painful emotions or situations, they often employ metaphor as a tool to help them make sense of and express their experiences (Semino, 2011). More specifically, it has been found that people produce more metaphors when describing intense emotional experiences than when describing actions (Fainsilber and Ortony, 1987) and that they generate more novel metaphors when writing about their *own* emotional experiences than when writing about the feelings of others (Williams-Whitney, Mio and Whitney, 1992). When an experience is not widely shared with the rest of society, metaphor can be one of the few tools that people have to communicate with (Gibbs, 1994). For example, Gibbs and Franks (2002) found a particularly high density of powerful creative metaphors in the narratives produced by women suffering from cancer. They argued that these metaphors helped them to understand and come to terms with their disease.

The reason why people may reach for metaphor when communicating about such complex and intense emotional experiences relates to the way in which it structures concepts. Metaphor functions by drawing relationships of comparison between two unrelated concepts. By using metaphor, therefore, speakers can draw on more familiar, tangible concepts which are easier to express to help them describe concepts which may be considerably more complex and abstract. This has three consequences which render metaphor particularly apt for talking about complex, difficult experiences. First, it serves as an aid to communication. In using familiar concepts to describe the unfamiliar, speakers can make it easier for their listeners to understand their experiences without having gone through them themselves. Second, it serves as an aid to empathy. The use of metaphors which are particularly vivid and striking, as well as drawing on experiences which are familiar, makes it easier for hearers to understand the *nature* of the experience and gain some insights into what it is like to go through it. Third, people use metaphor to conceptualise and come to terms with their own experiences, even when they are not being expressed. In their study of the narratives employed by women who had experienced cancer, Gibbs and Franks (ibid., 158) found that the women "embraced the power of metaphorical thought to make sense of the various, even contradictory, aspects of their experiences". The transformative power of metaphor following traumatic experiences is explored by Wilson and Lindy in their book *Trauma, Culture, and Metaphor: Pathways of Transformation and Integration.* They explore how trauma survivors employ metaphor to "speak the unspeakable," "invent or unconsciously manifest the language to express their extraordinary experiences" and use "these newly discovered words and phrases… to organize and represent… traumatic experiences." (Wilson & Lindy 2013, p. 35). They argue that:

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> […] language itself, particularly bodily centered metaphors, becomes the psychological scaffolding to carry forward these complex, cognitive, executive functions for adaptive behaviors. They are words in the form of understandable narrative that eventually becomes the container holding the survivor's experiences and making the journey home possible. It is a transformative process of complexity and challenge over time, space, and identity integration.
>
> (Wilson & Lindy 2013, p. 35)

It is therefore unsurprising that metaphor has been identified as a powerful tool in structuring concepts in helpful ways in the context of counselling and therapy (see Tay 2013 for a discussion of metaphor in psychotherapy, and Beder 2004 for a discussion of metaphor in bereavement counselling).

One particularly emotionally intense form of bereavement is that which follows the loss of a wanted pregnancy. It is estimated that approximately 1 in 6 known pregnancies end in miscarriage, approximately 1 in every 200 births is a stillbirth, and approximately 2000 terminations for reasons of foetal anomaly are performed in the UK each year.[2] Of all forms of bereavement, pregnancy loss may be particularly difficult to deal with as the subject is not widely discussed in British society (NHS Improving Quality, 2014; Peel and Cain, 2012), it is not a situation that is usually planned for and there is a lack of cultural scripts for dealing with perinatal bereavement. Moreover, this form of bereavement engenders complex emotions that are difficult to articulate, and the bereaved often struggle to communicate how they feel to those who are there to support them. Thus, they often resort to metaphor in order to come to terms with and express their feelings.

To date, there has been no research in the metaphor literature on the ways in which people who have experienced the loss of a baby through miscarriage, termination, or stillbirth, or the agencies who work with them, use metaphor to frame the experience. Studying the metaphors used by the bereaved and those who support them when talking about this emotionally-complex, potentially isolating experience and the decision-making processes that accompany it, will help generate insights into their thinking processes and open up additional lines of communication for those around them.

Our aim in this study is to explore how people who have experienced pregnancy loss use metaphor to make sense of what they are experiencing, and the reactions they have received from those around them. Our specific focus is on metaphors of time. This is because the impact of bereavement in general has been shown to have an effect on people's conceptions of time, and we were interested

2. www.nhs.uk/conditions/Miscarriage/Pages/Introduction.aspx

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in exploring this in more depth. In their analysis of interviews with older adults about their experiences following the death of a spouse, Chan and Chan (2011) found time to be the major theme in their data. They observed that participants exhibited a strong focus on timing of the death and that they experienced changing perceptions of time, which Chan and Chan labelled "paradoxical" (ibid.; 147). Participants who could accept the timing of the death were more likely to come to terms with the death itself. In terms of the so-called "paradoxical" perceptions of time, their participants were found to have developed a truncated experience of time in which the present was experienced as being separate from both the past and the future. They experienced a strong awareness of the here and now, during which days felt longer and emptier and time passed very slowly. Participants also exhibited a heightened awareness of their own approaching death, which was sometimes expressed in metaphorical terms:

> When I think of this [my own mortality] – sometimes this was discussed in the bereavement center. I cried after the discussion. I don't like … but I know every passenger has to get off the train. There is no reason to remain on the train till Tung Chung [terminus train station in Hong Kong]. Perhaps you still have to get off when you reach Tung Chung … I understand this principle, but I have fears. (Participant I) (ibid.; 153)

They concluded that grieving in older adults "throws them into an intense, existential, time-focused situation" (ibid.; 157).

Whilst some of Chan and Chan's participants may have felt that the timing of the death was appropriate, for people who experience pregnancy loss, the timing will never be "appropriate". This is due to conventional expectations that there is a "natural" order in which losses are experienced. This may lead to their experiences of time being even more marked. Therefore in our study, we were interested in identifying the time-related metaphors that people who have experienced pregnancy loss employed when talking about the loss itself, the build-up to the loss and its aftermath. Our specific research question is as follows:

> *How do people who have experienced pregnancy loss use metaphor to talk about their perceptions of time?*

We looked at the ways in which people in this situation reified time and at the metaphors for time that ensue from this reification. We also looked at their levels of awareness of time, the ways in which time was seen to expand and contract at times of heightened emotional experience, and the personal relationships that people have with time in relation to the moving time versus moving ego dichotomy and other models that describe the spatial language of time. Finally, we explored the ways in which people expressed their conceptions of time through the use of mixed metaphor.

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The data that we discuss are the result of the *Death before Birth Project*, an ESRC-funded socio-legal, linguistic study of how people in England who have experienced miscarriage, termination, and stillbirth reach decisions concerning the disposal of the remains of pregnancy,[3] how their perceptions of the law impact on their decision-making, and how they communicate their experiences and choices to those who are there to support them (see McGuinness & Kuberska 2017 for more information about the dataset).

In Section 2, we provide an overview of existing work on the ways in which metaphor is used to think and talk about time. We then describe the methodology employed in our study (Section 3) and report its findings (Section 4). We conclude, in Section 5, with a discussion of the implications that our findings have for those who care for people who have experienced pregnancy loss.

2. Metaphors of time

There has been a substantial amount of research on the ways in which people employ metaphor to think and communicate about time. It has been suggested that people often express time in terms of space and that whilst in English-speaking cultures, the future lies in front of us and the past lies behind us, in other cultures it can move from top to bottom or be seen as a cyclical phenomenon. Chinese uses the vertical axis such that earlier time-points are located above and later time-points are located below (Fuhrman et al., 2011) and some languages (e.g. Mian, a Papua New Guinea language) conceptualise time as flowing towards the body or from east to west (Fedden and Boroditsky, 2012). There is evidence to suggest that some space-time metaphors are embodied. For example, it has been shown that if people lean forward they find it easier to talk about the future than the past and that if they lean backwards they find it easier to talk about the past than the future (Lempert and Kinsbourne, 1982). The converse is also true: Miles et al. (2010 a and b) found that thinking about future events makes people lean or move forwards and thinking about past events makes them lean or move backwards. They conclude that spatiotemporal processing appears to be grounded in the same sensory-motor system that regulates human movement. Even within cultures that have a linear conception of time there is scope for viewing time differently, which allows people in the West, for example, to talk about "annual cycles", things taking place "all year round", and so on (see Gell 1992; James and Mills 2005).

3. In this chapter, "remains of pregnancy" is used to cover the range of physical material, from the existence of foetal remains to situations where there is heavy bleeding or light clotting.

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As an extension to the linear metaphor for time, the front-back orientation also constitutes a metaphor for success and failure; people often speak of success (e.g., "advance") and failure (e.g., "setback") as if they were forward versus backward movements through space. Robinson and Fetterman (2015) had participants categorize "success" versus "failure" words by moving a joystick forward or backward. They found that participants were faster at categorizing failure when asked to indicate it by moving the joystick backward and that they were faster at categorizing success when asked to indicate it by moving the joystick forward.

One of the most widely-cited pieces of work on the metaphorical relationship between time and space is Boroditsky et al.'s (2002) study of "moving time" versus "moving ego". In English, two contrasting perspectives are implicit in expressions relating to time: the moving time metaphor conceptualizes time as moving forward towards the ego and the moving ego metaphor conceptualizes the ego as moving forward towards the future. When people are asked "Next Wednesday's meeting has been moved forward two days; when is the meeting now that it has been rescheduled?", individuals employing a "moving time" metaphor will report that it has been moved to Monday, whereas individuals employing a "moving ego" metaphor will report that it has been moved to Friday. According to Boroditsky et al. (2002), these two conceptualizations are equally likely in a "neutral" context; some people reply that it is on Monday, whereas others reply that it is on Friday. However, the manipulation of contextual information can change people's perspectives. For example, they found that people who have been primed to think about objects traveling towards them are much more likely to think about time moving towards them and are thus likely to adopt a "moving time" perspective. People standing at the front of a queue rather than at the back were found to be more likely to think of themselves moving through time, thus adopting a moving ego perspective, and the same was true of people at an airport who had just flown in (as opposed to those who were waiting to pick up friends) and people at a racecourse who had bet on a number of horses (as opposed to those who had not). These findings suggest a strong interaction between one's thoughts about the experience of physical movement and the metaphorical construal of time in terms of different types of movement.

The "moving time" versus "moving ego" distinction has been problematised by Moore (2014) who provides a more nuanced analysis of the ways in which time can be represented in terms of space. Rather than viewing time as a unitary entity, he identifies a series of more fine-grained temporal concepts, such as "something that happens first", or "a future time", which are expressed via a number of different metaphors, such as "a situation is a mover" (e.g. "the candle burned from dusk till dawn"), "time is a mover" (e.g. "time marches on"), and so on (ibid., 303). Moore also points out that metaphorical construals of time are not always linear. As we

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saw above, they can also involve other types of movement. Alternatively, time can be seen as a physical resource, as a point, as a flexible, moving entity or in other metaphorical ways. We draw on some of Moore's ideas in our discussion below of the ways in which people who have experienced pregnancy loss talk about temporal concepts, but we complement it with corpus analyses and work with categories of time that emerge from the data. Therefore in places the categories of time identified in our data diverge from the categories identified by Moore.

3. Methodology

3.1 Data collection

In order to answer our research question, we conducted a combined qualitative and quantitative analysis of interview data. The data were gathered through semi-structured 60–90-minute interviews with 31 women who had experienced miscarriage, termination due to foetal anomaly, and stillbirth, and with four partners and friends of these women. We also spoke to 16 people who provide support for the bereaved, and who work for the Miscarriage Association (MA), Antenatal Results and Choices (ARC) and the Stillbirth and Neonatal Death Society (SANDS). The majority of the support workers we interviewed had themselves been through pregnancy loss, and therefore had first-hand insights into the experience. The interviews explored themes in the experience of pregnancy loss, focusing on choices surrounding the disposal of the remains of pregnancy, and how these decisions may be reached.

The interviews were conducted face to face or by Skype and were audio-recorded and transcribed, and the interviewer noted down salient uses of gesture and critical observations. Access to the participants was provided by advertisements publicised by our partner organisations (the MA, ARC and SANDS).

3.2 Data analysis

The data analysis proceeded in three stages: (1) a Wmatrix analysis of the key semantic fields; (2) an analysis of uses of the word "time"; and (3) a qualitative analysis of the metaphors used to talk about people's experiences of time. These three approaches allowed us to look at the ways in which time was referred to from different perspectives in our dataset.

3.2.1 *A Wmatrix analysis of the key semantic fields*

In order to get a broad sense of the key semantic fields in the data, a Wmatrix analysis was conducted. Using this tool, we identified key semantic fields in our data in

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comparison with the 982,712-word spoken component of the BNC Sampler corpus used by the Wmatrix system. This analysis revealed semantic fields which appeared significantly more often in our participants' responses than in the BNC Spoken Sampler comparison corpus. We use the results to investigate the extent to which our data is different from spoken data more generally.[4] We were interested to see how time featured within this analysis. It should be noted that here we are comparing the language used by people who have experienced pregnancy loss to language in general and not specifically to the language used by people who have experienced more general forms of bereavement. At present, we are not aware of the existence of any matched corpora containing interviews with bereaved people more generally, but if such a corpus becomes available this would constitute an interesting investigation.

3.2.2 *An analysis of uses of the word "time"*

In order to investigate the ways in which *time* was construed in our 387,300-word corpus, regardless of whether it was being referred to metaphorically, we conducted a concordance search for the word *time* ($N = 937$) and then coded the concordance lines into five categories:

1. Time as an event or point (e.g. "there was a time when we did that")
2. Time as a resource (e.g. "they've got time to think about what to say")
3. Time as a period (e.g. "there has to be a time frame")
4. Time on a clock (e.g. "7 o'clock local time, people will light a candle")
5. Time as an experience that is evaluated (e.g. "it was a really, really grim time")

These five categories had been previously compiled using definitions of the word *time* in WordNet (Princeton University 2010) (a lexical database originally derived from the Brown corpus), and the Longman Dictionary of Contemporary English. We collapsed the definitions provided by these sources into five broad categories which subsumed all the sub-senses. Some examples were coded as occupying more than one category. There were 9 instances of this in our data (out of a total of 937 examples) so caution needs to be exercised as this procedure inflated our numbers slightly. One example is as follows:

In twelve months' time, they may have moved on, had a baby or whatever

This was categorised as both an event and as a period because although it does refer to a particular point in time in the future, the actions that are being discussed are expected to occur within the period leading up to that point. Another example

4. Wmatrix (Rayson, 2009) is a tool that can identify words and semantic fields occurring significantly more frequently in the language used in a sample of language than in language more generally.

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is as follows, which was categorised as both an event and as an experience that was evaluated:

It's not a good time to be making life-changing decisions

It should be noted here that our coding of uses of the word *time* into these categories is purely quantitative and involved no investigation into polarity or valence.

We used this procedure to identify patterns in the way in which the participants in our dataset talked about time, and to provide a backdrop against which our metaphor analysis could be interpreted.

3.2.3 *A qualitative analysis of the metaphors used to talk about people's experiences of time*

As mentioned above, this study forms part of a larger project that was designed to explore the experience of pregnancy loss more generally. To this end, we began by conducting a full metaphor analysis of the data with no specific focus on time, although we will be focusing on time-related metaphors in the current study. However, the main focus of the study described in this paper is not simply on expressions that contained the word *time* but on metaphorical expressions that referred to time more generally, and on the ways in which time related to other concepts. We therefore conducted a qualitative analysis of the metaphors that were related to time, in order to assess how they were being used and what they revealed about the speakers' metaphorical conceptions of time.

We first uploaded the transcripts of the interviews into the NVivo qualitative annotation software package and coded them according to the types of metaphor used and the themes that the metaphors were used to talk about. In order to decide whether an utterance was metaphorical or not, we employed an adapted version of the PRAGGLEJAZ Group (2007) Metaphor Identification Procedure, which we combined with Cameron's (2003) vehicle identification procedure to identify metaphors at the level of the phrase. We then classified the metaphors into broad categories. Each metaphorical chunk of language was assigned to at least one metaphorical theme and at least one topic. The coding scheme was developed by three coders through joint analyses of the first five transcripts. Subsequent transcripts were then coded individually. Each transcript was checked by a second coder and marginal cases were discussed until agreement was reached.

Sixty-seven categories of metaphor were identified, including metaphors involving space, darkness and light, movement, growth, ascent and descent, and containment. The focus of this chapter is on metaphors of time. We identified 81 themes that included: coming to terms with the pregnancy loss; communicating with others about the loss; reflecting on the future; and memory-making. More details on the metaphors that we identified are provided below.

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4. Findings

4.1 Identification of the key semantic fields in Wmatrix

References to time constituted two of the 20 most statistically significant key semantic themes in the dataset (number 1 and 20 in Table 1). In other words, semantic domains involving time appeared significantly more frequently in our data than in a comparison corpus. The fact that time featured in two of the key semantic fields in our data is not surprising given that the participants were talking about ages of children (in number 1) and time-sensitive procedures (in number 20). As stated above, the focus of this chapter is on the different ways in which they discussed time metaphorically.

As Table 1 shows, many of the key semantic fields are to be expected given the topics under discussion (for example *medicines, dead, sad*). Two were related to time, but when we look at the examples contributing to the keyness we can see that they provide little insight into the psychological ramifications of the loss. They relate more to procedural concerns, such as: the amount of time that people needed to wait between stages of treatment; the delay before receiving post-mortem results; and the time between diagnosis of foetal death and delivery, all of which reflect the particular nature of this bereavement. In order to gain insights into the psychological effects of the loss, more detailed approaches are needed which focus specifically on time. In the two approaches that follow we look at time as a word (Section 4.2) and time as a concept (Section 4.3).

4.2 Analysis of the uses of the word "time"

As mentioned above, time constituted two of the key (i.e. statistically over-represented) semantic fields in our data, as revealed by the Wmatrix analysis. In order to investigate in more detail how time was being referred to, we conducted a concordance analysis of the word "time". The distribution of the five categories is shown in Table 2.

As Table 2 shows, the first sense of time, "time as an event or point", was the most frequently used in our data, followed by "time as a period" and "time as a resource". "Time on a clock" and "time as an experience that is evaluated" do not seem to be particularly salient senses of time in our data.

As we will see below, some of these categories were exploited metaphorically by our participants, others less so. We will also see how the general patterns alluded to in this table were also attested in the metaphors used, with some senses of time seeming to be more relevant to our participants than others.

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Table 1. Key semantic fields in participant data, ranked by log-likelihood

	Observed frequency in participant responses	Relative frequency in participant responses	Observed frequency in the spoken sampler corpus	Relative frequency in the spoken sampler corpus	Log likelihood	Log ratio	Semantic field	Examples
1	2053	0.47	171	0.02	3744.24	4.75	Time: new and young	*Younger, smaller, babies*
2	2886	0.66	1024	0.1	3040.89	2.66	Medicines and medical treatment	*Medical, abortion, screening, caesarean*
3	5984	1.36	5481	0.56	2238.1	1.29	Knowledgeable	*Know, remember, experience, information*
4	924	0.21	12	0	2051.5	7.43	Mental actions and processes	*Memories, mental health, dream, intuitive*
5	5455	1.24	5457	0.56	1721.97	1.16	Degree: boosters	*Desperately, extremely, profoundly, terribly*
6	1148	0.26	400	0.04	1223.93	2.68	Sad	*Grief, upset, pain, traumatic*

(*Continued*)

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Table 1. (*Continued*)

	Observed frequency in participant responses	Relative frequency in participant responses	Observed frequency in the spoken sampler corpus	Relative frequency in the spoken sampler corpus	Log likelihood	Log ratio	Semantic field	Examples
7	3043	0.69	2728	0.28	1182.44	1.32	People	*Sex, identity, human beings, people*
8	1220	0.28	501	0.05	1160.69	2.45	Dead	*Died, loss, bereavement, remains*
9	2220	0.51	2020	0.21	840.23	1.3	Helping	*Support, help, counselling, charity*
10	1382	0.31	959	0.1	787.29	1.69	Disease	*Miscarriage, abnormality, problem, syndrome*
11	6871	1.56	10107	1.03	696.12	0.61	Speech: communicative	*Say, talk, story, conversation*
12	5130	1.17	7031	0.72	688.24	0.71	Thought, belief	*Think, feel, reason, trust*
13	3143	0.72	3703	0.38	676.2	0.93	Anatomy and physiology	*Pregnant, birth, labour, heartbeat*
14	3997	0.91	5480	0.56	535.58	0.71	Exclusivizers/ particularizers	*Actually, especially, particularly, strictly*

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Table 1. (*Continued*)

	Observed frequency in participant responses	Relative frequency in participant responses	Observed frequency in the spoken sampler corpus	Relative frequency in the spoken sampler corpus	Log likelihood	Log ratio	Semantic field	Examples
15	506	0.12	207	0.02	482.77	2.45	Failure	*Lost, failed, missed, disaster*
16	1766	0.4	1891	0.19	481.24	1.06	Cause and Effect / Connection	*have, make, cause, reason*
17	246	0.06	22	0	442.12	4.64	Personality traits	*Pragmatic, personality, character, type*
18	1773	0.4	2031	0.21	410.58	0.97	Change	*Happened, getting, change, moving*
19	263	0.06	51	0.01	377.01	3.53	Alive	*Alive, survive, living, life expectancy*
20	234	0.05	35	0	367.68	3.9	Time: general	*Appointment, late, rhythm, late sixties*

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Table 2. Categories of time identified in our dataset

No.	Category of time	Example	Number	Percentage
1	Time as an event or point	…at a time when they are completely distressed	480	50.74%
2	Time as a resource	I hadn't had time to think "I could do this" or "could do that"	195	20.61%
3	Time as a period	You could be with them for a very long time	224	23.68%
4	Time on a clock	They give us the time and date of the funeral	11	1.16%
5	Time as an experience that is evaluated	It's a very significant time for a lot of our members	36	3.81%

4.3 Qualitative analysis of the metaphors used to talk about time

Having identified the senses of *time* present in the dataset, we can now move to a discussion of the ways in which time was talked about metaphorically. We will be demonstrating how metaphor can provide insights into participants' conceptualisations of time, and the role of time in these metaphors as a source, a target, or the context in which the metaphor functions.

In order to do this, we undertook a full metaphor analysis on the dataset, identifying areas where participants were using metaphor to conceptualise their experiences. We identified a total of 67 metaphor categories in our dataset, of which we present the ten most common in Table 3. Many of the examples in the four most heavily-populated categories (categories 1–4 in Table 3) were closely related to time, as we can see in the examples shown in Table 3. Time was also involved to varying extents with the other metaphors. We found that time operated as a target domain for some of the metaphors, and in other cases time was implicated in a complex network of interrelated metaphorical underpinnings; it may function as a source, a target, an entailment, or simply as the context in which the source and target exist.

For example, take the idea of "***entering a grief world***". This metaphor involves *moving ego* where the individual sees themselves as moving through time, enabling them also to draw on metaphors relating to *journeys* and *physical location*. To take another metaphor from Table 3, when the participant says 'they don't quite grasp ***where a bereaved person is***', they are in effect talking about where that person is on a temporal trajectory as they move through the grieving process. In this example, although time is not foregrounded, an awareness of the temporal perspective contributes to the overall meaning of the utterance. In contrast, in the example, 'are you gonna remain ***broken*** forever like this' time is being discussed in more literal terms ("forever") and against this temporal

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backdrop we have the embodied metaphor of a person being 'broken'. The same can be said for the example of metaphor provided within the "agency and lack of agency" category ("it's like a ***rollercoaster***"); again, this metaphor involves a temporal backdrop in which the participant was talking about bereavement as a *process* and not as a static entity.

Table 3. The ten most heavily-populated categories of metaphor in the dataset with examples

Rank	Metaphor category	Example	No. of instances (out of a total of 2691 annotated instances)
1	Reification	Be as kind to yourself as you can (.) ***giving yourself time and space***[a]	839
2	Moving ego	it feels impossible to ***shift and move forward*** and imagine that they'll ever ***get beyond*** (.) this moment	673
3	Journey	people will I suppose (.) ***move forward*** on it in a way that I s'pose is congruent with their conceptualisation of their experience I'm ***veering one way or the other***	461
4	Physical location	they don't quite grasp ***where a bereaved person is*** it's meeting parents ***where they are in their grief*** as well	397
5	Body-related or embodied metaphors	what is your ***gut feeling***, what's your, what's your ***heart saying***, are you gonna remain ***broken*** forever like this	207
6	Animacy	time would ***heal*** for her	194
7	Container	when you're grieving you can sort of ***enter sort of a grief world*** where you start to push, push people away	177
8	Divided self	***My brain*** was obviously still in shock mode I tend to go off on tangents and ***lose where I am myself***	141
9	Seeing	sort of be there, available to them with u- utter kindness, patience, tolerance, understanding, non-assumptive presence and just ***witness*** their struggle	127
10	Agency, lack of agency	***it's like a rollercoaster*** that's, like, throughout the day, throughout weeks, days, weeks, like that – sometimes in an hour in those first, you know, months	106

a. In this paper, relevant metaphorical phrases in each example are italicised and emboldened. It should be noted that not all metaphors in each example are identified or discussed. This is not restricted to the level of the word; words from the surrounding context may be included for clarity where this is necessary for understanding of the metaphor.

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Because of the complex nature of the relationship between time and the metaphors and the complex relationships between the metaphors themselves, it does not make sense to discuss the above categories one-by-one, which meant we needed to find an alternative way of structuring our analysis. In order to do this, we looked at the overlapping metaphors in the examples and identified a set of over-arching themes around which they appeared to cluster. These were: (1) reification, (2) the displacement, expansion and heightened awareness of time, and (3) personal relationships with time, with respect to the moving time versus moving ego perspective. We also found a number of instances in which the participants combined the use of different metaphors to convey their message. We also found that the participants' metaphorical references to time were complemented in places by relatively non-metaphorical references to time.

4.3.1 *The reification of time and its entailments*

As with other abstract concepts, people often reify time, and talk about it as if it were a tangible object that can be manipulated, exchanged and at times, ascribed animacy. This was also true of the ways in which the participants in our study talked about time. In these examples, time is mainly being considered as a resource (category 2 in Table 2).

The reification of time allowed for scenarios in which time could be given and received, either by the bereaved themselves as in Example (1), or by their supporters as in Example (2).

(1) being as kind to yourself as you can[.] ***giving yourself time*** and space not expecting to be okay perhaps really quickly. If you are, great, but you know, if you're not that's fine too

(2) I think you need to ***give them time*** for it to sink in

However, the reification of time as an object which could be given and received could also lead to more negative conceptualisations in which time was considered to be a finite resource, as shown in Example (3).

(3) I think I felt like I was only ***allowed to have a certain amount of time*** feeling the way I did about it?

Thus, the reification of time in this way opens up the possibility for the "allocation" of time to be the responsibility of someone else; the idea that the woman was "only allowed to have a certain amount of time" in the example above implies a lack of agency on the part of the bereaved, as she is not in control of the amount of time she considers herself to have.

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In the examples discussed so far in this section, time is seen as a "gift" or a (sometimes limited) resource that can be used to aid healing. In contrast to these relatively positive conceptions of reified time however, there were other examples in which time, and specifically individuals' experiences of it, became a hindrance. Example (4) below relates to a family's decision to have a termination following a diagnosis of foetal abnormality at 21 weeks of gestation. In it, the concept of time is experienced as being "pressed", causing the bereaved family to feel "under quite a bit of pressure", perhaps due to the fact that after 24 weeks, the process for accessing a termination becomes more complex. In Example (5), which was produced by a supporter, however, the idea of having a finite amount of time is seen as a positive, while being able to access support at any time may be detrimental to an individual's recovery.

(4) I arranged a meeting for the next week pretty much (.) because (.) you know (.) ***time felt pressed at that point***, you know, the consultant was very keen for (.) things to sort of be brought to a close quite (.) quite quickly so they felt (.) you know (.) under quite a bit of pressure

(5) having support twenty four hours might not be such a good thing. You might need: ***time you know the classic counselling format which, your hour's up I'll see you next week***, gives you the message you can find that coping mechanism in your own space, in your own skin

Here, we see that the reification of time can constitute a source of conflict, with a finite amount of time being seen as a source of pressure for the bereaved but a positive tool in the recovery process by their supporters. We will see further examples of this later on, where it will be shown that conceptualisations of time as a "resource", as here, may not be as useful or relevant for the bereaved.

Reification of time in this way was not particular to our participants; it is common in English to reify time in this way, although it is slightly more frequent in our data than in the BNC spoken subcorpus: instances of verbs taking time as an object (e.g. *take time, spend time, have time*) account for 636.91 per million words in our data, versus 406.70 per million in the BNC spoken subcorpus. However, despite the fact that the reification of time is a conventional phenomenon, the way different people talk about this reified time provides insights into the different ways in which they conceptualise their relationship with it.

We can see an example of this in Example (6) where one of the support workers accords reified time the status of an animate object that has an ability to effect changes in an individual's emotional state. In this example, time is seen as an entity that had the power to "heal", as shown here:

(6) acknowledging that maybe that was just a season and that ***time would heal for her*** and (.) that things would get better for her as time went on

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However, in our dataset, there was an imbalance in the use of this sense of time between individuals who had gone through pregnancy loss, and those who were there to support them. The bereaved themselves did not tend to engage with this metaphor, suggesting a disjunction between their own conceptualisations of their experiences and those of supporters.

The idea that time can "heal" resonates with the classic 5-stage linear grief model (denial – anger – bargaining – depression – acceptance) (Bowlby 1961) that implies a change of feelings accompanying the sequence of stages, and, more importantly, suggests that while the event is unchangeable (e.g. death), one's attitude to it will alter with the passage of time. While this grief model has been widely criticised in psychology (e.g. Bonanno 2009), its underpinning logic, which appears to relate to the idea that "time heals all wounds", remains a key factor in cultural understandings of bereavement and grief. Although the passage of time has indeed been found to blur the details of remembered past events in general terms (e.g. Schacter 1997, 2002), memories of *traumatic* events have been found to be qualitatively different; they are more likely to be stored "as physical sensations that are experienced as immediate life threats – *right now*" rather than as past narratives (e.g. Levine 2015, n.p). Since pregnancy losses have been viewed as a cause of post-traumatic stress disorder (e.g. Farren et al. 2016), it is more likely that the grief will be of this non-linear nature, and therefore concepts of time as a healing resource may not be the most relevant. The fact that the bereaved tended not to see time in this way may explain why "time as a resource" only constituted 20.61% uses of the word *time* in the dataset.

4.3.2 *Time displacement, expansion of time, and altered levels of awareness of time*

We noted at the outset that bereavement often causes its sufferers to experience time differently (a phenomenon described as "paradoxical perceptions of time" by Chan and Chan (2011: 147)). Two manifestations of paradoxical perceptions of time demonstrated by our participants involved cases where it was displaced or expanded.

4.3.2.1 Time displacement

First, we saw that time could be displaced, and that hypothetical "future" events were enacted in the present to help deal with the grieving process, which could result in a blurring of the boundaries between the literal and the metaphorical. Consider, for example, Example (7), an extract from a discussion between two midwives about a father's wishes following the stillbirth of his son:

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(7) A: Before the funeral, it's your time to do the things that you wanted to do, so I understand that many dreams you had aren't achievable, but if there are some, our job is to help you dream the dream basically, and lots of them are to do with dad, but we've had dad who always wanted beer, and he said I want a can of beer, dad and lad, we've facilitated that
B: Yeah he wanted a can of beer with his da- his son and sadly his son was stillborn, so we let him have some beer in the family room with his baby

In this extract, the father metaphorically "shared a beer" with his son, an activity that he might normally have engaged in on his son's eighteenth birthday. Because of the circumstances, he has metaphorically "jumped forward" eighteen years in his attempt to reconcile two incompatible realities. There is thus a conflation of a real and an imagined world, which makes sense in the eyes of the father but which may appear paradoxical to an outsider. This scenario may also be reminiscent of the tradition of "wetting the baby's head", in which new fathers go out for a celebratory drink with their friends after the birth of a baby. It could be that because the father in this scenario could not "wet the baby's head", he wanted to combine elements of this with the idea of going for a first drink with his son, in recognition that he would not be able to do either. This is typical of the fuzzy nature of the boundaries between the literal and the metaphorical in situations where what was "real" has become "unreal" and what was "unreal" has become "real". This experience appears to contribute to the experiential displacement of time.

Whereas in the example we have just seen, a *future* event is displaced to the present, in other cases, *past* events were experienced as if they were in the present, as can be seen in Example (8) below:

(8) I saw everywhere pregnant woman, pregnant woman with pushchairs which was just, every single time when I saw them I was just crying? Cause I knew that <tearfully>especially when I saw twins, when I saw twins</tearfully) (..) I still have this, when I see twins it's just unbelievable, ***past two and a half year since, since this moment and it, it's still alive, it's still so painful***

In this example, the length of time since the bereavement period has been compressed into a much shorter time period. The past has become very present and real and the traumatic event is experienced as "now." Her use of the word "alive" emphasises the continued presence of the experience; the experience is "alive" because it is always "now."

4.3.2.2 The expansion of time

As well as being displaced, time could also be expanded. Example (9) shows how this expansion can take place in an individual's own perception of time.

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(9) so the doctor did say before he scanned me, look, I'm going to scan you, I'm not going to say anything, and my silence is not an indication either way, because you know I have to see what I have to see first, and it might be that, you know, it's complicated and I don't want to interrupt my scanning by talking to you about it so please don't think that silence is bad. But I think what got me was it, was the, the length of the silence, so obviously I'd had two children before and, and I'd had two, well, four scans, two early dating scans and two anomaly scans and I think like that felt like the longest <quietly>it probably wasn't that long to be honest</quietly> ***but it FELT like the LONGEST time EVER. I mean it was S:O long,*** and then eventually he said I'm sorry…

This is very much in line with work on people's perceptions of time more generally. It is a well contested fact that the perceived duration of a time interval can seem longer or shorter relative to real time depending on the nature of the experience that fills that interval, with more intense periods being remembered as having lasted longer. This phenomenon has been attributed to changes in state of the stimulus environment (Fraisse, 1984) and the fact that more memory space is allocated to major events (Ornstein, 1969). The experience of a diagnosis of pregnancy loss can be such a tumultuous event that time feels like it has come to a virtual standstill. These examples demonstrate that time, when viewed in terms of space, can be a malleable concept in the context of bereavement following pregnancy loss. It is important for friends, colleagues and relatives to acknowledge this, recognising that during and following a bereavement, an individual may have a very different experience of the passage of time to them.

4.3.2.3 Increased and reduced levels of awareness of time

In the last section, we saw that bereaved individuals can experience time in subjective and sometimes unexpected ways, with time being displaced and short time periods feeling longer. This is a reflection of a more general phenomenon in which participants in our study demonstrated either increased or reduced levels of awareness of the passing of time, according to the context. Although these instances do not involve specifically metaphorical representations of time, we believe that they are of interest as they further exemplify the importance of one's awareness of time during this difficult period.

An example of a woman's heightened awareness of time can be seen in Example (10):

(10) ***you know the time*** (.) you know, I could tell you what happened on the day baby [NAME] died on the Sunday like it was yesterday (.) ***I know what time (.) what time we came back***

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Similarly, the bereaved seem able to envisage a point in the future where they will want memories of the bereavement and its immediate aftermath, as shown in their desire to "extract… goodness and happy memories" to look back on:

(11) the grief process starts as soon as the bad news arrives on that twenty-week scan … but you know they were ***really desperate to extract as much (.) goodness and happy memories (.) you know things that they could look back on in five years' time (.) ten years' time (.)*** and maybe the warmth would match the grief (.) or even overshadow the grief that they (.) they remember

The fact that individuals appeared to have a heightened awareness of time as an event or point chimes with our earlier findings in Section 4.2, which showed that time as an event or point constituted 50.74% of the uses of the word time.

(12) it did feel a bit weird being off sick but not actually sick, kinda ***filling up time during the day was a little bit strange***

This also relates to Chan & Chan's (2011) findings that were discussed in the literature review, specifically that their participants found it difficult to use their time on a day-to-day basis. Crucially, this may not be the case for those around the bereaved, who may hold very different views of time. This was suggested in Section 4.3.1 above, when we saw that one individual felt that she was only "allowed" a certain amount of time. Similarly, in Example (13), acquaintances of the bereaved are represented as having an "invisible watch", marking off the period of time considered to be socially acceptable to grieve for a lost child – to not be "over it". For the bereaved, however, there is no such structure or timeline to their recovery, with time seeming "irrelevant". Here are the words of one of the bereavement midwives in our study:

(13) I would say it's us as a society that puts pressure on parents to get over it, you know, because people will see you out and about, you know, (.) a week after you've had your baby and they'll see you in Sainsburys and they'll go, oh you're over it then. (.) It's as if there's this ***invisible watch*** that says, you know what I mean, (.) and it doesn't mean they're over it, it just means that they're trying to engage in the world (.)
[…]
as time goes on (.) erm (.) yeah (.) your baby lives on in your heart and ***time seems irrelevant you know***

We can see a reduced awareness of time in this account, where a bereaved woman is describing her feelings in the immediate aftermath of being told her twins had not survived:

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(14) to be honest ***I don't remember how long I was there. I seriously don't remember.*** It needed to be some time cause I remember that my sister came and then before my husband came cause he, he is working like ten miles away (…) so he needed to drive as well so I think I was around one hour at least there. And to be honest I- though I was there and I had this time ***I wasn't thinking about things like that***

Shortly after this, however, she talks about how important she felt it was to have an induction as soon as possible, showing that her perception of time has changed again: now, time has become a compressed resource of which she is highly aware. Similarly, she describes the process of arranging the funeral as "so many different things uh which to think (*sic*) in a really short time", suggesting that the idea of time as a resource is incompatible with the experience of the bereavement. This ties in with theories of time's role in the experience of grief as discussed in Section 4.1 above. Acknowledging this incompatibility is therefore likely to be an important part of a support relationship. The tension between competing conceptualisations of time further suggests that some conventional understandings of grief might be unproductive for those who have actually experienced pregnancy loss, such as the idea that people can "get over it" or that time is all that is needed to heal.

4.3.3 *Personal relationships with time, with respect to the moving time versus moving ego perspective*

We saw in Section 2 above that moving forwards in time is frequently conceptualised as moving forwards in space but that in some cases time can be perceived as moving towards the protagonist. Both conceptualisations were found in our data; however, there were many more "moving ego" conceptualisations (673) than "moving time" conceptualisations (30). Examples (15) – (20) below show some of the "moving ego" conceptualisations produced by our participants:

(15) ***I'm six years down the line*** now so I can sort of- I know to expect it

(16) people (.) you know (.) are told to ***move on*** […] they're just so (.) insensitive (.) expressions (.) because ***move on*** from what? (.) You know, (.) your baby's died and that's it, it's final, it's irreversible (.)

(17) I'm still ***going through it***

(18) I've still been able to ***get past the hardest point***

(19) I was no longer pregnant and just sort of ***on with it you go?***

(20) it feels impossible to ***shift and move forward and imagine that they'll ever get beyond (.) this moment***

While moving ego conceptualisations of time are often thought to facilitate agency, the examples produced by our participants were characterised by an apparent lack of agency, as we can see in Examples (21) and (22) below:

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(21) it wasn't my decision when the babies were gonna be born. I was now ***in their hands***

(22) you know I felt very much that ***my hands were almost tied***, that, you know, they were sort of ***pushing me to go down the medical route***

Similarly, when we look more closely at the ways in which the moving ego metaphor was used, we can see that even though agency is allowed, the types of verbs that were used tended not to be associated with agency. For example, the string "going through" was a key bi-gram in our corpus, and although it reflects a moving ego orientation the verb "going" has less agency than other more "manner of movement" type verbs. Similarly, "go through" tends to carry negative connotations, as evidenced by a collocation analysis in the BNC. Of the top 100 collocates (by logdice) in the BNC, 12 were found to be negative (e.g. *pain, hell, agony, trauma*), while the rest were neutral or literal. There were no positive collocations. The string "been through it" was a key trigram when compared with the spoken subcorpus of the British National Corpus. It was significantly more common in our data (31 instances; 94.9 per million words) than in the BNC (10 instances; 0.8 per million words).

We encountered some cases of the "moving ego" conceptualisations that went beyond the boundaries of what is normally covered by this description. For instance, in Example (23) below, the concept of grief is personified, given agency to be a moving participant as well as the ego:

(23) then the [grief](.) ***it catches up with you*** (.) a little bit later

At times, participants stepped completely outside the moving time/moving ego dichotomy and experienced time as something separate from them; they experienced themselves as being outside the world and its "timeline". This is shown in Example (24) below:

(24) It's so hard because you come out of hospital and ***the world is still carrying on but your world has stopped***

The support workers were highly sensitive to this phenomenon; it appeared frequently in their descriptions of the losses experienced by their clients, and may have been informed by their own experiences of pregnancy loss:

(25) this is what I describe to parents (.) if the world is ***going round*** that's the world you know (.) and then when you have a baby that's died ***you get off*** (.) you know, the world is still ***going around*** (.) and then ***as time goes on***, you know (.) you might ***go round*** a couple of times and then ***get off*** again and ***get on*** again (.) do you know what I mean, and then gradually you'll get back on but you have to do it ***at your own pace*** so it's kind of ***dipping in and out*** you know

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(26) they're ***stuck in a spiral*** of negativity[.]

(27) it is a sort of your ***transition back out of raw grief*** to, to, er, to where the world you're rebuilding life again

This experience is very different from the experiences of time that are often discussed in the context of the moving time/moving ego distinction, nor is it mentioned in Moore's (2014) more comprehensive account of time-space metaphors. It appears to be an experience that is peculiar to people who have experienced some kind of traumatic event or serious depression, and is not limited to pregnancy loss *per se*. In many ways, it parallels the themes of Irving's ethnographic work with people living with HIV/AIDS that considers how "the temporality… of people's bodies becomes radically destabilised during and after illness" (2005: 317). For Irving's participants, this was literal; their illnesses rendered them bedridden, removed from their everyday world. For our participants, this is more metaphorical; while they are not literally removed from society, the taboo and silence around their loss may make them feel that the world is carrying on without them. This alienated sense of temporality is both created and exacerbated by their subjective conceptions of time, which may make it difficult for others to relate to them. It may be productive for friends and relatives to be aware of, and sensitive to, this sense of temporal alienation.

In Examples (28)–(30) below, we see participants making use of the *moving time* metaphor, which can have the effect of removing agency from the individual.

(28) As time ***goes on***

(29) Or it could be that they have decided to have a termination and it's in the days ***leading up*** to that

(30) We've got a funeral ***coming up***

Of these examples, only the third fits with the classic moving time/moving ego distinction where events "approach" the protagonist from the future. The other two reflect a more general, ego-less sort of moving-time metaphor, which is more in line with Moore's (2014) idea of time as a "mover" in which the direction of travel is the same as the ego.

4.3.4 *Mixed metaphors*

Finally, people's attempts to describe their experience of time sometimes involved the combination of several different metaphors. Although for many people, the idea of "mixing one's metaphors" is seen as an instance of poor language use, researchers in the field of metaphor studies have shown that mixing one's metaphors is rather common and that it can serve as a powerful and effective form of communication. Indeed, a whole edited volume has been dedicated to the topic of mixed metaphor (Gibbs, 2016).

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Example (31) below is taken from an interview with a woman whose twin pregnancy ended in the stillbirth of one of the twins. In it, we see metaphors of space, moving ego, reification, size, journey, and physical pain.

(31) we will see a set of twins that are around the same age as [TWIN1] and [TWIN2] were and we will- it will be like, can't really be around here. ***Need some space.*** But they don't ***see*** it every day. To them, you know, we had the funeral, it was all very sad, it's still all very sad but ***life goes on*** and (.) they don't get (.) what we're still ***going through*** and what we will always still ***go through*** … They are really supportive in their own way. But they don't ***go through*** it every day? Um ***small things*** to them aren't as significant as they are to [HUSBAND] and I. um (.) so you know [TWIN1] ***achieving a milestone*** is, is a ***knife in the heart*** every time because you should be having two of them ***receiving a milestone*** or ***going through that milestone.***

Mixed metaphors were also employed by the support workers when describing the grief and recovery processes. In Example (32), we see metaphors of place (linked to moving ego), fighting, lightness and darkness.

(32) Erm:because everyone that she's attended a meeting with has either gone on to have more children or: just seem to be ***in a better place*** anyway erm: so she feels very negative and very let down about that because she's ***battling*** with herself as well as to, why isn't she better now, why can't she ***move on*** a little bit and (.) why is she still ***in such a dark place two years on***

The use of mixed metaphors in these interviews resonates with Charteris-Black's (2016) research into the use of mixed metaphors in descriptions of pain. He argued that mixing metaphor in descriptions of pain was a purposeful decision on the part of the speaker, used to emphasise the fact that their pain was "out of control" and therefore more intense. It could be, therefore, that the use of mixed metaphors in these accounts serves a similar purpose, highlighting the intensity of the experiences of the bereaved. It also provides further evidence that time metaphors form part of a complex network of metaphorical ideas, and should not be looked at in isolation.

5. Conclusion

The aim of this paper has been to explore the metaphors that people produce when coming to terms with and sharing the experience of pregnancy loss. We have used our analysis of these metaphors to gain insights into the emotional landscape of people who are experiencing this form of bereavement. We focus on metaphor because of its power to facilitate understanding, empathy, and conceptualisation; people use metaphor to frame and share their experience, as discussed in Section 1.

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The focus of the paper was on time because (a) bereavement in general has been found to have an impact on people's experience of time and (b) metaphorical and literal references to time were often produced by our participants.

In our analysis of the metaphors produced, we identified a set of over-arching themes around which references to time appeared to cluster. These were: (1) reification, (2) the displacement, expansion and heightened awareness of time, and (3) personal relationships with time, with respect to the moving time versus moving ego perspective. Although the reification of time was not peculiar to our corpus, we found that it could constitute a source of conflict, with a finite amount of time being seen as a source of pressure for the bereaved but a positive tool in the recovery process by their supporters. It therefore seems that different metaphorical conceptualisations of time may be more or less relevant or helpful to the bereaved, and that supporters need to be sensitive to this.

Our participants produced metaphors which seemed to indicate more "paradoxical" construals of time. We found that time could be displaced, and that hypothetical "future" events were enacted in the present to help deal with the grieving process. We also saw that time could be expanded, which could result in a blurring of the boundaries between the literal and the metaphorical. This suggests that the traumatic experience of pregnancy loss can lead people to experience changing metaphorical construals of time, some of which may be unconventional. An analysis of the metaphors that participants produce in their accounts can help us to uncover these changing construals. Some of the participants in our study also appear to have developed increased or reduced levels of awareness of time, which although not metaphorical *per se*, underpin the salience of time as a feature of the experience of pregnancy loss, and provide added poignancy to some of the metaphorical perceptions discussed above.

Turning to the personal relationships that our participants had with time, we found that moving ego perspectives greatly outnumbered moving time perspectives but that they involved a marked lack of agency. Many of the ways in which our participants described their relationships with time bore no relationship to the moving time/moving ego perspective, although some appeared to reflect Moore's (2014) idea of time as a mover, following the same direction of travel as the participant. For some individuals, their experiences appear to have taken them outside linear time completely; they report experiences of occupying a space outside the world and its timeline, of watching their world "spiralling out of control". Support workers also made use of this metaphor, which may underscore its importance to the bereaved. Our participants' metaphorical conceptualisations of time often interacted with other metaphors, such as those whose source domains involve space, darkness and light, and physical pain. These findings suggest that friends, colleagues and relatives should tread carefully when discussing time in the context

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of grief, recognising that the bereaved may have different configurations of time and that these need to be respected.

Theoretically speaking, we found that references to time in our dataset had a complex relationship with metaphor, which went somewhat beyond the moving time/moving ego distinction and the conceptualisations of time proposed by Moore (2014). While time operated as a target domain for some of the metaphors, in other cases it was implicated in a complex network of interrelated metaphorical underpinnings. Our findings suggest that time exists in a complex web of meanings, some metaphorical, some not, and that conceptions of time seem to bridge the gap between the metaphorical and the literal. The interaction between metaphorical and non-metaphorical language in discussions about time, and the interaction between different metaphors, could prove fruitful avenues of further study, both from a theoretical perspective and in order to help us gain deeper insights into experiences of loss.

Our findings add to our understanding of the ways in which time is experienced following a bereavement. Because there is currently no corpus of bereavement interviews more generally we are not able explore the extent to which these metaphors differ from or are shared with bereavement more generally. However, as we have seen throughout the paper, some of our findings (such as the expansion of time) do resonate with findings from the bereavement literature, whereas others (such as the compression of time) remain to be explored in a more general bereavement context.

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SECTION 4

Other theoretical analysis and cognitive or computational modelling

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Metaphor generation through context sensitive distributional semantics

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In this paper, we outline a preliminary methodology for generating metaphor based on contextual projections of representations built up through a statistical analysis of a large-scale linguistic corpus. These projections involve defining subspaces of co-occurrence statistics in which we show that metaphors can be modelled as mappings between congruent regions of semantic representations. We offer this methodology as an empirical implementation pointing towards a resolution of theoretical stances, at times incompatible, construing metaphor as on the one hand an artefact of underlying cognitive processes and on the other hand a product of the environmentally situated generation of ephemeral conceptual schemes.

Keywords: metaphor generation, pragmatics, distributional semantics, natural language processing, context sensitive semantic modelling

1. Introduction

In this chapter we discuss an idea for a novel computational methodology for metaphor generation. This methodology is inspired by a foray into the rich theory that has sought to address questions of how both how and why humans so ubiquitously resort to metaphor in their communications with one another. The account that we embrace here is, largely, pragmatic in nature, in that we view metaphor as a mechanism for using words to accomplish communicative objectives in a particular complex environmental setting, rather than as a computation of ways in which elements of a semantic representation can be projected across conceptual domains. Our aim is not to reject the idea of a more representational approach to metaphor, but we would like to consider what might be involved in a computational approach to representing metaphor generation as something that happens in a situated way, treating language as an artefact of the environment as well as of

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the mind. A consequence of our accommodation of this stance on metaphor is that it becomes very difficult to consider how to appropriately evaluate the success of a novel metaphor: while we offer some thoughts on how this might happen, what we present here is an idea rather than a quantitative research effort.

Our proposed methodology is rooted in *distributional semantics*, a paradigm, well-known amongst computational linguists, for building up word representations from statistical data about observations of word use in such a way that the meaning of words is in a certain sense built into the representation itself, and into the way that representations of different words interact with one another. This technique has already been productively applied to a variety of natural language processing tasks. The essential novel feature of our methodology is that it offers a mechanism for the situational contextualization of representations, allowing for the projection of extemporaneous semantic subspaces, representing, in the parlance of relevance theory, *ad hoc* conceptualizations (see Section 2), in which word representations are expected to relate to one another and to the space itself in ways that pertain to a specific conceptual scheme. We take it as given that the idea of representing word meaning in a context specific way is desirable, and indeed our methodology has already been applied productively to metaphor classification (Agres et al., 2016) as well as the task of classifying the related non-literal phenomenon of semantic type coercion (McGregor et al., 2017).

Beyond offering an outline of a computational technique for generating metaphor, this work has been conceived as an empirical mechanism for exploring a theoretical issue in the study of metaphor. In particular we would like to consider the productive dichotomy between cognitive linguistic approaches to metaphor, which have conceived of metaphorical language as a manifestation of underlying metaphorical cognitive processes, and pragmatic accounts of metaphor, which, particularly under the banner of relevance theory, have considered figurative language as the deep end of a gradient of loose language use corresponding to the situational way in which concepts are formed by linguistic agents. There has already been productive dialogue between proponents of each perspective, which we will briefly survey below. We think of our methodology as an instantiation of a theoretical stance which seeks to incorporate insight from both theoretical camps. We would especially like to present our work as a preliminary account of how a statistical technique can be applied to the pragmatic account of metaphor, something that has proven challenging for computational methodologies.

It is worth mentioning from the outset that our notion of *context* is itself based on a pragmatic interpretation of how meaning comes about in the process of a linguistic agent's interaction with other agents in the world. As such, we will talk about context as the overall situation of being in the world, including various non- linguistic components of the experience of existence as a cognitive entity. In this regard, our application of *context* will be considerably more expansive than the meaning

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of the word sometimes encountered in computational linguistics, where *context* is taken to indicate only the textual surroundings in which a particular unit of analysis, such as a word, is observed – though this latter notion is an essential component of the methodology we will describe, and we will refer to this as *co-occurrence*. In practice, the degree to which a computational process based on an analysis of relatively abstract data can capture this more fully embedded notion of context is one of the fundamental questions behind the methodology we would like to explore.

In particular, our methodology generates context specific subspaces based on input in the form of sets of words: if there is a semantic coherency to such a set of words, then our expectation is that the projection of word representations, in the form of vectors, into this subspace will be endowed with some of the conceptual nuance corresponding to that semantic context. Our methodology then facilitates the exploration of the geometric relationships between words in these subspaces. We propose that metaphor in particular can be understood in terms of mappings between conceptual domains within subspaces, defined as arrangements of semantically associated word-vectors. This commitment lends itself both to visualization (in three dimensional spaces) and to straightforward computation of new metaphors (in arbitrarily high dimensional spaces). Importantly, our geometries can be interpreted in terms of tendencies of word use observed in an underlying corpus, meaning that the operation of our methodology can be pushed back out of the computations themselves and into expectations about how tendencies in language use relate to the construction of metaphor.

The work described here, while it includes some concrete examples of how our methodology can potentially operate, is an initial description of a general framework: we are not yet at the point where we can simply input a few words into a terminal and expect a well-formed, functional metaphor to be output. As such, we do not claim to present a comprehensive empirical model of context sensitive metaphor generation here; rather, we outline some of the theoretical issues at stake, and propose a data driven, statistically grounded approach that we suggest has the potential to address these issues. In fact, our claim is that the high dimensional representational spaces associated with distributional semantics, more than just presenting a possible technique for metaphor generation, offer certain properties that are particularly appealing when considering the way that metaphor emerges contextually in the process of linguistic agents' interaction with one another in an unpredictable world.

What we can do is work backwards from instances of known metaphors, establish that there are configurations of our technique in which these metaphors can be generated, and then consider the ways in which we might rework this reversed procedure in order to produce new metaphoric mappings based on input consisting of words indicating a target domain and words indicating the context in which a metaphor might arise. We will offer a preliminary consideration of what some of the next computational steps in the implied research project might

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look like. In the end, the evaluation of computer-generated metaphor, particularly creative metaphor, is in itself a significant challenge. While our work is not yet at the stage where a meaningful evaluation is possible, we suggest that an evaluator would need to in some sense take into account the context in which a metaphor is generated in order to determine the quality of the output.

Finally, we will argue that the directness of our geometric methodology offers a way towards an ecologically situated model of language, in which metaphor comes about as linguistic agents grasp for whatever semantic objects they can find for communicating about situations as they unfold in an unpredictable environment. By this theory, opportunities for meaning-making are directly perceived in the affordances of the linguistic components available to an agent *in situ*, and the application of lexicalized terms in surprising semantic contexts is an expected outcome of this scenario. Language then becomes, as Clark (2006) puts it, "a kind of self-constructed cognitive niche: a persisting but never stationary material scaffolding whose crucial role in promoting thought and reason remains surprisingly poorly understood," (p. 370).

2. Language in minds, minds in the world

At the root of much of the theoretical and psycholinguistic work that has been done on metaphor over the past several decades, and indeed some of the more recent computational advances in the field (see Section 3) is the idea that "we systematically use inference patterns from one conceptual domain to reason about another conceptual domain," (Lakoff and Johnson, 2003, p. 246). At least one of the appealing features of a model of metaphor rooted in conceptual structures and isomorphisms between these structures is that it provides a mechanism for a dynamic interplay between the semantic commitments of metaphor in language and the corresponding features of cognition (Gibbs, 1994). The commitment to a close link between metaphor as it arises in language and corresponding cognitive processes has allowed for productive mappings between domains of human experience in terms of the application of metaphoric language: through the study of metaphors projecting from the domain of the body to that of the mind, for instance (Sweetser, 1990), or projecting from orientation in space to conception of time (Fauconnier and Turner, 2008).

An open question, though, regards the role of concepts themselves in both language and cognition. It would be convenient for the conceptual approach to metaphor if concepts could be modelled as well-defined composite structures, characterized by components that afford mappings between their parts. Somewhat contrarily, however, Barsalou (1992, 1993) has described the *ad hoc* nature of conceptualization

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as it occurs in the complex cognitive environment of a linguistic agent: Barsalou examines the way in which concepts emerge as recursive concatenations of *frames* that come about in the course of goal-directed action in a situation in the world. By Barsalou's account, frames provide a structure to a concept, accommodating representational roles for *attributes* and *values*. Importantly, though, these structures come about *contextually*: a cognitive agent constructs a frame in response to a specific situation encountered in its environment, based to some extent on prototypical attributes and values. The *ad hoc* nature of these conceptual structures contributes in a fundamental way to the flexibility inherent in language in use.

Applying this contextually situated cognitive framework specifically to metaphor, Carston (2002) points out that there are a variety of cases (paradigmatically "Bill is a bulldozer") where there is no clearly explicit transfer of properties from the domain of the source to the domain of the target; rather, the *ad hoc* concept BULLDOZER* seems to take on, in the course of its context specific generation, properties that are peculiar to the domain of human action and affect. Without claiming to have landed on a definitive solution to the problem of mappings between evidently disparate domains, one path towards an answer suggested by Carston is that there could be mappings discovered specifically by way of a kind of congruency between the structures of domains, correlations which would presumably not necessarily fall back on any actual conceptual overlap between the components of the structures (see Gentner, 1983, for a foundational exploration of *structure mapping*).

A productive dialogue has subsequently evolved between the cognitive and pragmatic camps. So, for instance, Gibbs and Tendahl (2006) propose that the mappings between disjoint stable and *ad hoc* conceptual domains – the mapping from, for example, MACHINE to HUMAN – are in fact encoded as encyclopedic conceptual metaphors that offer a conduit that might be hidden from an analysis of the more specific conceptual properties at play in a particular expression. Carston (2012) responds by acknowledging that there may be a systematization at work in the metaphoric linking of certain broad conceptual domains, but maintains that the underlying cognitive mechanisms behind these links involve patterns of abstract thought rather than metaphoric extrapolation from relatively concrete domains, with metaphor itself emerging as a communicative rather than cognitive mechanism. The upshot of this discourse is twofold: on the one hand, there is clearly much to be gained from the interaction between the cognitive stance on the fundamental metaphoricity of thought and the pragmatic framework of situated conceptualization (and indeed, much has been gained); on the other hand, there is still an important unanswered question regarding the conceptual foundations of the transmission of information via metaphor.

Indications of a middle way might be found in the controversial theoretical position taken by Davidson (1978), who famously suggests that "metaphors mean

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what the words, in their most literal interpretation, mean, and nothing more," (p. 245). Davidson's point is not that metaphors are in some sense secondary to the propositional content of the language conveying them; rather, his goal is to make a distinction between the philosophically risky notion of *meaning* as it relates to lexical representations – words – and a separate notion of *what a metaphor makes us notice* which is associated with the effects of metaphoric utterances as opposed to the interpretation of the semantic content of a metaphor. Ultimately, Davidson is denying that metaphors, in their capacities as insight bearing functionaries, have any propositional content at all. As Reimer (2001) puts it in her analysis of Davidson's stance, "the goal of the metaphor-maker is not to get the hearer to see that something is the case, to grasp some deep and subtle truth, but to see something in a certain way, and seeing something in a certain way is simply not the sort of thing that can be given literal expression," (p. 150).

The Davidsonian approach to metaphor presents a particular challenge to computational modelling: how are symbol manipulating systems to get at the essence of a metaphor if it specifically lies beyond the boundaries of the type of propositional content of structured lexical semantic representations that computers are capable of handling? The methodology described in this paper has been constructed specifically to address this theoretically appealing, technically challenging dilemma. This novel approach is built upon a semantic model that construes lexical representations as points in high dimensional spaces, and incorporates the insight that in such spaces, context specific semantic relationships can be understood as lower dimensional perspectives on an underlying representational structure. Because these representations exist alongside one another in an abstract and relatively unstructured statistical space, the propositional value of the geometric relationships to one another is at best ambiguous. Rather than constructing metaphors as mappings between highly structured conceptual representations, then, our approach models metaphor in terms of transformations across congruent geometric semantic structures in subspaces which are themselves projected from a base lexical space generated from an analysis of large-scale textual data. These transformations within projections arise fleetingly, as the ephemera of *ad hoc* conceptualizations that occur in the situation of a cognitive context.

As such, the inauguration of this computational approach to metaphor is necessarily generative rather than interpretive. This is because the methodology does not presume that the production of a metaphor is underpinned by a propositional interpretation; in fact, the strength and theoretical thrust of the approach is that metaphors are discovered as geometric elements of semantic spaces, affording the opportunity for communication without necessarily explicating any communicated content. In this regard, we propose that our approach, while incorporating some of the cognitive linguistic insight which has been productive in existing computational approaches to metaphor, simultaneously opens itself

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up to a pragmatic account of concepts as situated and temporary constructs, and indeed to Davidson's outright rejection of structured cognitive content as a feature of metaphor. Ultimately, we believe that our approach has the potential to accommodate a linguistic adaptation of the ecological psychology of Gibson (1979), who describes cognition in terms of the direct perception of opportunities for action in an environment: just as a cognitive agent perceives objects in terms of the goal-oriented actions that they afford, a linguistic agent perceives language generation in terms of opportunities for communication, and so metaphors emerge as the product of such an agent taking up lexical entities and using them as best fits some communicative requirement.

3. Computational approaches to metaphor

As Shutova (2015) has noted in her comprehensive survey of the field, the *selectional preference* approach of Wilks (1978) has been fundamental to a certain mode of computational metaphor modelling. By this account, metaphor involves the projection of the conceptual attributes associated with one conceptual structure onto another: words are associated with structured representations, and metaphor involves the resolution of instances of *preference breaking* where the attributional expectations of a semantic frame are not satisfied by the supplied term. A type theoretical application constructed along similar lines is described by van Genabith (1999), who makes use of the observation that metaphor can, at least sometimes, be treated as a kind of condensed mode of simile. From a theoretical standpoint, this approach lines up somewhat with Searle's (1979) view on metaphor, which holds that metaphor interpretation involves an identification of a semantic dislocation followed by a search for an inferential interpretation based upon beliefs about a metaphoric source that somehow apply to its target. There is, for that matter, a correspondence with the pragmatic account of Grice (1975), which casts metaphor in terms of the implicatures signalled through the activation of communicative norms (see Reimer, 2013, for a recent exploration of Gricean pragmatics in light of subsequent research on metaphor).

Elsewhere, however, cognitive linguistic approaches to metaphor, and in particular the conceptual metaphor model of Lakoff and Johnson (2003), have provided fertile theoretical material for computational linguistic applications. So, for instance, the ATT-Meta system of Barnden and Lee (1999) specifically targets "useful, common sense reasoning based on metaphor" (p. 28) through a system for developing novel hypotheses about conceptual relationships across elements of established metaphorical domain mappings. And the CorMet system of Mason (2004) extrapolates mappings of a dataset of conceptual metaphors from an analysis of the WordNet lexical taxonomy. Kintsch's (2000) work on metaphor

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comprehension is likewise influenced by the idea that metaphors emerge from mapping between conceptual domains, rather than as computations arising from resolving violations of categorical inclusion.

Conceptual metaphor theory has been particularly influential on relatively recent developments in data-driven, statistical approaches to metaphor that take advantage of a combination of growing computational power and increasing access to large-scale digitized corpora. In this spirit, Shutova et al. (2013) use word co-occurrence patterns to discover conceptual metaphoric mappings as correspondences in usage between concrete and abstract domains. Similarly, Tsvetkov et al. (2014) train a model to classify metaphoric expressions based on statistical characteristics of the words involved in phrases, using co-occurrence profiles as the units of analysis in predicting, for instance, the abstractness of particular concepts.

These last cases of data-driven systems for metaphor classification and interpretation are examples of a general trend by which statistical approaches to metaphor generally operate, directly or indirectly, in the vicinity of the distributional semantic paradigm. Dating back to the theoretical research of Harris (1954) and the applied work of Salton et al. (1975) and Schütze (1992), among others, this approach to natural language processing involves quantifying observations about the way in which words tend to co-occur with one another over the course of large-scale textual corpora. Working off the basic intuition that, as Pantel (2005) puts it, "words that occur in the same contexts tend to have similar meaning," (p. 126), the objective is to build up informationally rich lexical representations that facilitate quantitative analysis of semantic relationships. By representing words as vectors in a space defined in terms of axes of co-occurrence tendencies, the geometry of the space itself is endowed with semantic interpretability: so, through either the tabulation of collocations or the gradual adjustment of representations across iterative traversals of a corpus (Mikolov et al., 2013). Clark (2015) offers a comprehensive overview of the field, and our own application of distributional semantic modelling will be discussed in the following section.

The conceptual metaphor model is particularly conducive to quantitative operations on computationally tractable representations. To offer a little background here, Coecke et al. (2011), among others, have described a compositional language model that represents words as linear-algebraic structures, in particular combinations of vectors and higher order tensors.[1] The upshot of this data-intensive approach to modelling meaning is that, by assigning different representational structures to different grammatical classes, a model can describe the composition of words into sentences in terms of products between mathematical

1. Those authors have in particular sought to cash their compositional approach out in terms of the quantification of propositional statements; see also Grefenstette et al. (2014).

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entities. So, for instance, Baroni and Zamparelli (2010) have shown that, by representing nouns as vectors and adjectives as matrices, a noun-adjective phrase can be treated as a transformation where the operation of the adjective-matrix maps the noun-vector into the proximity of other words and terms conceptually related to the phrase being modelled.

Gutiérrez et al. (2016) offer an exemplary implementation of the way in which this space-transforming approach can be applied to the modelling of metaphor: following on the work in word sense disambiguation of Kartsaklis and Sadrzadeh (2013), they construct separate matrices based on observations of metaphoric and literal usage of a give adjective, reasoning that the model should then learn to map adjective-noun phrases according to the respective interpretations of the adjectives in question. So, for instance, *brilliant girl* should be mapped to a region of a semantic space occupied by other phrases such as *clever boy* and *intelligent child*, while *brilliant diamond* should be mapped into the vicinity of things like *shining emerald* and *bright stone*. They apply their model to the task of classifying metaphor by evaluating the proximity of the transformation of metaphoric versus literal representations of adjectives to the distributional profiles observed through treating the phrase itself as a unit of analysis, anticipating that the linear algebraic composition of $brilliant_{\text{MET}}$ and *boy* should be closer to *brilliant boy* than that of $brilliant_{\text{LIT}}$ and *boy*. The authors generalize their approach within the theoretical context of conceptual metaphor by learning broader mappings between conceptual domains that can be applied to compositions of noun-vectors with literal adjective-matrices to discover figurative transformations.

A nice thing about the application of compositional operations to distributional semantic representations is that it facilitates a model of metaphors as conceptual mappings. A more problematic aspect of this approach is that an already established propositional interpretation has to be built into the transformative representations based on something explicitly observed in the underlying data. Therefore, a given transformation depends either on the observation of existing instances of a particular component of a conceptual metaphor, and a corresponding *de facto* lexicalization of a metaphorical sense of a word, or else on the prior configuration of a network of conceptual mappings. We would like to propose a distributional technique that makes the most of the transformational characteristics of linear algebraic representations, but that also accommodates the *ad hoc*, context specific way in which metaphor comes about, allowing for the open ended association of conceptual domains. We would also like to remain open to Davidson's (1978) suggestion that "there are no unsuccessful metaphors," (p. 245), or at least that the situations in which language might be engaged are so various that we should be prepared for effectively any unlikely linguistic composition to be applied.

A metaphor is, as such, in our approach, first discovered as an opportunity for contextualized communication, and only subsequently interpreted in terms of

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any cross-conceptual alignments that can be extrapolated from the metaphor – if in fact any such interpretation ever occurs, since it should be at least feasible that a metaphor can function as an effective communicative device without ever arriving at an explication of propositional content. This means that this first pass at a framework for *ad hoc* metaphor will be about generation rather than classification, and so it is appropriate to briefly consider existing work on this particular aspect of the computational modelling of metaphor, as well. Veale and Hao (2007) mine the web using syntagmatic heuristics indicative of attribute-projecting language in order to build up a knowledge base that, in conjunction with access to a lexical taxonomy indicating entailment relationships, can be used to generate novel metaphoric adjective-noun combinations: so conceptual mappings are learned from clues discovered in linguistic surface forms. Gargett and Barnden (2013), on the other hand, have described the Gen-Meta system for metaphor generation, based on the above mentioned ATT-Meta approach to metaphor interpretation and applying the logic that an interpretive process can potentially be construed as a generative process in reverse, effectively applying broad but established mappings between domains to discover more particular novel instances of metaphoric associations.

4. Semantics in perspective

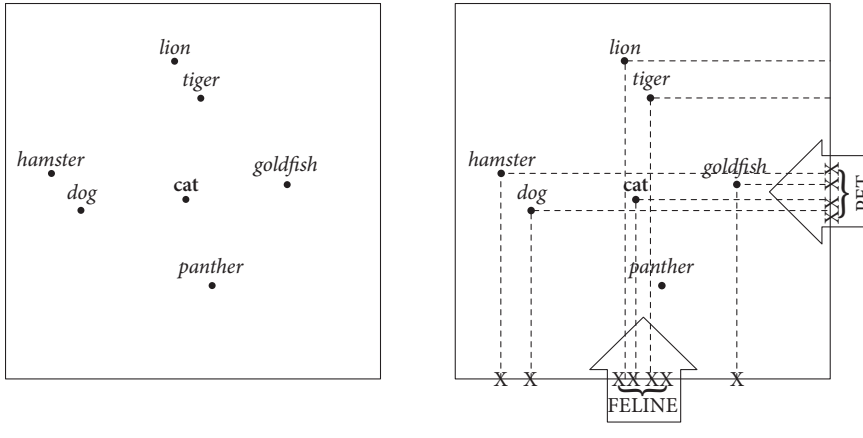
An advantage of distributional semantic techniques is that they provide robust representations that can in principle be composed in open-ended ways to generate previously unobserved but nonetheless semantically situated combinations of words, aligning with the combinatorial propensity of natural language itself. In a space of word-vectors built based on an analysis of the way words co-occur in a corpus, every word shares values across the same underlying set of features. So, for instance, if we are modelling the words *cat* and *dog* based on observations of those words in sentences in a corpus, we might reasonably expect categorical hypernyms such as *pet* and *animal* to have a high co-occurrence for both words, as well as descriptors such as *big, black*, and *pet*. Over the course of many such observations, quantified into a vector the features of which correspond to statistics about these observations, we will gradually see the vectors $\overrightarrow{cat}$ and $\overrightarrow{dog}$ occupy a similar region of the semantic space we are constructing, and from this we may infer that *cat* and *dog* denote similar things.

A related disadvantage is that the construction of semantic representations incorporates information about the way in which words co-occur with one another without regard for the conceptual nuances inherent in the syntagmatic relationships of words in a sentence. This means that such a model cannot in any real sense be construed as interpreting the language which it encounters or any underlying conceptual commitments; it is simply building up representations of linguistic

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tendencies, and the proximity of semantically related lexical representations is an artefact of the associated labels having correspondingly similar tendencies in their usage, not of any underlying extrapolation of conceptual structure from an experience of the world. In other words, a computational application based on a distributional semantic methodology cannot in any sense be said to actually read or understand a text.

Furthermore, as implicatures and word senses are naturally not acknowledged by the process of constructing distributional semantic representations, all the looseness and ambiguity of language in use is imported into the representational framework. In the case of metaphor in particular, we must assume that metaphor will be ubiquitous in any non-trivial collection of language, and so metaphoric senses of words will be built into the model to a degree roughly in correlation with their typicality. So, returning to our example involving cats and dogs, *cat* will reasonably be expected to co-occur with, in addition to words indicating animals, words like *cool* and *hep* associated with the metaphorical connotation of the word as someone connected to jazz music, while *dog* will, in the sense that the word can metaphorically refer to a villain, be observed in the vicinity of other words like *treacherous* and *cursed*. An illustration of the inherent messiness of a distributional semantic model is offered in Figure 1a, where, without even transgressing literal senses of the word, we can see that the space surrounding *cat*, in this two-dimensional projection, includes terms related to both the colloquial sense of membership of the category PET and the biological sense associated with the category FELINE.



(a) A Semantic Space

(b) Conceptual Perspectives

Figure 1. The image on the left shows a semantic space as learned from the analysis of word distributions across a corpus, with all its inherent messiness, while the image on the right demonstrates how context specific conceptualizations are afforded by lower dimensional perspectives

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Our methodology proposes to turn this apparent disadvantage into a productive feature of a metaphor generating system. The insight underlying our approach is that, in a high dimensional space, a variety of lower dimensional perspectives can be taken, affording the online projection of context specific semantic subspaces in which the effects of *ad hoc* conceptualization take on momentary geometric characteristics. This idea is illustrated in Figure 1b, where we see that the context specific sense of the representations associated with *cat* collapse into two different coherent regions from two distinct points of view. This regionalization of concepts is broadly in line with the *conceptual spaces* of Gärdenfors (2000), who describes a model by which conceptual domains are represented as convex regions in spaces delineated by dimensions that map to the intensional properties. The process of contextualization in our framework and the conceptual geometries that emerge from these contextualizations are particularly relevant to the modelling of metaphor, since metaphor arises in context and can involve the projection of salient properties that are likewise contextually specified from one domain to another.

The procedure for building our context sensitive distributional semantic methodology begins with the selection of a corpus which will serve as a basis for analyzing the ways in which words co-occur with one another. We've chosen to use the English language version of Wikipedia, in part because it contains a large number of well-formed sentences covering a wide ranging vocabulary. We build a matrix of co-occurrence statistics tallying the number of times words occur within the same sentence and within a certain perimeter of one another, weighted using an information theoretical metric that takes into account the relative independent frequencies of words in order to avoid inflating the values associated with very common words (technical details can be found in McGregor et al., 2015). The precise formulation of this weighting scheme, proposed in McGregor et al. (2015), is as follows:

$$M(w,c) = \log_2\left(\frac{f(w,c)\times W}{f(c)\times(f(c)+a)}+1\right) \qquad (1)$$

Here, $M(w,c)$ represents the weighted statistical value of a word w co-occurring with a word c; $f(w,c)$ is the frequency at which w and c are observed to co-occur; $f(w)$ and $f(c)$ are the independent frequencies at which w and c occur in the corpus; and W is the overall count of word tokens in the corpus. The value a is a weighting constant designed to avoid the selection of especially obscure words in our context projection procedure (see Section 5), while 1 is added to the overall ratio in order to ensure that all values are greater than zero, with a value of zero indicating that w and c have never been observed to co-occur at all.

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This initial modelling procedure results in a large and sparse array of statistics about language use – large in that there are about eight million unique word types in Wikipedia, any one of which might be observed co-occurring with any other word, and sparse in that most of these never do co-occur with one another, and indeed a great many of these words only appear once or twice across all five-million-plus articles on the website. The values of this large, sparse matrix are effectively coordinates for situating semantic representations in a space. With this in mind, we treat this matrix as a *base space* from which we can perform contextualized semantic projections: this base corresponds to the messy, ambiguous semantic space of Figure 1a. An important difference between that visualization and the computational operation of our methodology, however, is that there are a very large number of perspectives to be taken on a high-dimensional vector space. So, for instance, if we were to consider all the possible ways to pick a subspace from an eight million dimensional base space, we would have to sort through a total of $2^{8,000,000}$ projections – a figure significantly larger than the number of atoms in the entire universe.

This exponential explosion of possible subspaces has sometimes been referred to as the curse of dimensionality by statisticians and computer scientists, as it leads to problematically immense search spaces when, for instance, trying to find an optimal combination of parameters for solving a problem (Bellman, 2003). In the case of our methodology, however, we see this proliferation of potential geometric arrangements between word-vectors as a source of contextual bountifulness, providing the basis for an effectively limitless range of conceptual relationships. Having established a base space of lexical representations that permit the establishment of a preponderance of semantic perspectives, the crucial question becomes how we choose the right subspace for discovering and thereby generating a new metaphor.

5. Projecting metaphorical mappings

In principle, our contextual projections should correspond with a specific conceptualization of the world, and so also with some cognitive state: the projection represents the situation in which a cognitive-linguistic agent finds occasion to adapt a word to a metaphorical context. We would like to be able to somehow preemptively select a range of co-occurrence dimensions which capture this process of conceptualization and then feel our way through this subspace, discovering the mappings between semantic representations as opportunities for metaphoric meaning-making. By this view, metaphor generation is a process of production and then search, entailing the perception on the part of the metaphor-making agent of ways to mean and to communicate meaning in a cognitive environment.

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The methodology is therefore in theory a dynamic one, with input from the world serving as the basis for a projection which in turn lends itself to the output which completes the loop between agent and environment.

In practice, for the purposes of this exposition of a novel computational framework, we will perform something of a trick of reverse engineering, beginning with metaphors each mapping a range of semantic representations from one conceptual domain to another and then examining the subspaces that facilitate these mappings. This process will be, in effect, a proof-of-concept: we will demonstrate that there are, in principle, subspaces in which metaphors are resolved as mappings between geometrically aligned regions, and that these subspaces can be interpreted in terms of a set of observable co-occurrence features across which the components of metaphors have regular tendencies over the course of our corpus. What will remain an open question is whether there is a systematic way to select these co-occurrence features based on a particular contextual input, without a metaphor mapping from words in a source domain to words in a target domain specified *a priori*.

In order to construct these subspaces, then, we begin with a group of words comprised of a set of metaphorical sources paired with a set of metaphorical targets. We examine the word-vectors for each of the words in this set and extrapolate a range of co-occurrence dimensions with relatively high values for all the words in the set. We can consider these dimensions to broadly delineate a semantic subspace capturing the features salient to the conceptual category implied by that particular combination of input words. So, for instance, taking the target words (*surgeon, scalpel, patient, hospital*) and the source words (*butcher, knife, meat, shop*) as our inputs, we discover that the collectively most typical co-occurrence terms for these words are things like *nurse, stab, cutting*, and *kill*.

Next, having established this set of co-occurrence dimensions which we know to be informative about all the input terms, we can iterate through combinations of these dimensions in order to discover the sets that are best suited to projecting the pairs of metaphors as isomorphically aligned congruent geometric regions. Four examples of such projections, drawing from a set of 100 dimensions deemed conceptually relevant to the word-vectors being analyzed and using combinations of only three co-occurrence dimensions for the sake of visualization, are presented in Figure 2.[2] In each plot, two different conceptual domains are represented as two separate quadrilaterals, each corner being defined by the position of a word-vector

2. Note that the curse of dimensionality is still at play here, if not quite at the same scale as when picking arbitrary subspaces from the full base space of 8 million co-occurrence features: there are 161,700 ways to pick three dimensions from 100.

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labeled with a word that is semantically pertinent to that domain. In each case, by extending a line from the origin of the subspace through and then beyond a point in the source domain, we very nearly arrive at the point indicated by the corresponding representation in the metaphorical target domain. In each case, the subspace has been chosen in order to facilitate this generative mapping.

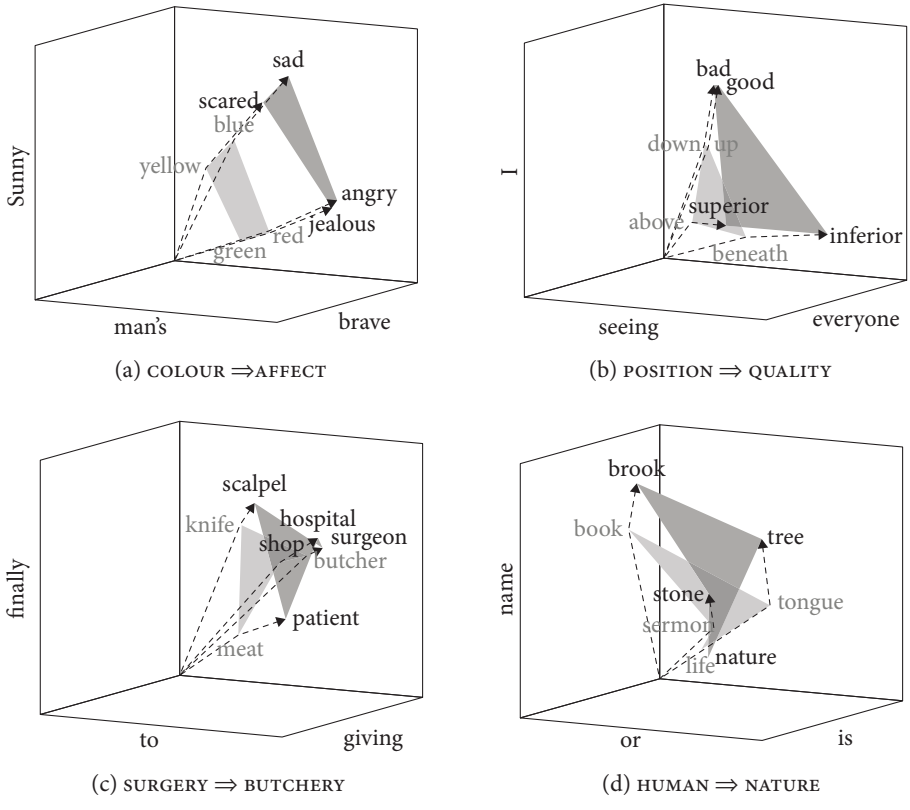
Plots 2a and 2b map from relatively concrete domains, pertaining to vision and proprioception respectively, to the more abstract domains of emotion and quality judgments. As Lakoff and Johnson (2003) have written, metaphor "involves all the natural dimensions of our experience, including aspects of our sense experiences," (p. 235), and so these color and orientation metaphors fit neatly into the general ontology of the theory of conceptual metaphors. They are, by the same token, tinged with cultural relativism: as Levinson (1996) tells us, the cognitive construction and corresponding vocabulary of spatial relations in particular can vary immensely between different groups of language users.[3] With this in mind, it should be possible to discover subspaces in which these mappings would work out differently. The point to appreciate here, though, is that these different subspaces correspond to different conceptual contextualizations, and in principle we should be able to generate any metaphor we like in an open-ended way: after all, in some conceptual sense, ravens can be writing desks and people are telescopes, and we would like our methodology to afford us the opportunity to discover all of these mappings.

Plots 2c and 2d, on the other hand, are mappings between more specific domains. In the first instance, we examine a metaphor that has been discussed perhaps to the point of tedium by linguists, namely that of the butcherous surgeon, filled in with some more details regarding potential intensional mappings from the one profession to the other. Something to note here is the potential for reversal of the metaphor, since we can easily enough imagine describing a particularly skillful butcher with the vocabulary of stereotypical surgical precision. But again, as with the metaphors of orientation and color, a recalibration of these relationships would involve a reconsideration of the underlying dimensions defining the subspace, and so in effect a reconceptualization of the cognitive context in which the new metaphor would arise. This potential for reversibility gives rise to another interesting question, however, since not all metaphors

3. An interesting question to pursue empirically would be to see if particular corpora, which, as Caliskan et al. (2017) have recently pointed out, are themselves prone to absorb culturally specific biases that are then subsequently necessarily incorporated into statistically derived semantic models, are more or less conducive to the modelling of corresponding cultural metaphors.

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are evenly balanced in this regard: to borrow an example from Veale and Hao (2007), the metaphor *cigarettes* are *time bombs* is easy enough to understand, but swapping source and target generates something more conceptually bizarre. The point is not that there should be no way to reverse any given metaphor, because there is certainly *some* context in which *time bombs* are *cigarettes*, but this mapping requires a greater degree of contextualization – and so we expect the appropriate subspace to be less likely to arise.



(a) COLOUR ⇒AFFECT (b) POSITION ⇒ QUALITY

(c) SURGERY ⇒ BUTCHERY (d) HUMAN ⇒ NATURE

Figure 2. Four examples of context specific projections in which metaphoric mappings between conceptual regions of semantic representations emerge

Finally, in the case of Plot 2d, we have generated an interpretation of Duke Senior's speech at the beginning of the Second Act of *As You Like It*, where he declares:

> And this our life, exempt from public haunt,
> Finds tongues in trees, books in the running brooks,
> Sermons in stones, and good in everything.

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Here we have an example of a subspace in which we can generate the evocative kind of mappings that Carston (2010) has referred to as *imagistic* in their propensity for conjuring up non-propositional mental content. But, where Carston proposes two distinct, albeit not exclusive, routes to metaphor understanding, we would like to present a methodology which encapsulates a singular path to metaphor generation. So here we see that, in the contextual projection of geometric subspaces, we can frame metaphor generation in terms of a unified process of mapping between isomorphic domains: the metaphor is, in effect, the product of the perception of *how* to convey mental content that has arisen in response to some situation in the world, and the discovery of the words that do the job under those circumstances is not really any different whether the metaphor is conveying something banal or sublime.

In every case explored here, we suggest that the conceptually specific subspace of contextualized semantic relationships offers up affordances of meaning making, and the language user grabs these lexical opportunities for communication and applies them, much as if they were a tool found lying on the ground at just the right moment. Our case is that, in addition to accommodating the *ad hoc* construction of conceptual structures, a geometric approach involving congruences within contextually projected subspaces can create a basis for modelling the evident perceptual immediacy with which metaphor is generated. Once a subspace is specified, identifying mappings between domains is simply a matter of identifying aligned and matched shapes. The outstanding question is then how to determine these subspaces in the first place. In the following section, we will explore a technique for discovering these subspaces analytically, and will suggest the broad possibility for a data driven approach for the generative construction of such subspaces.

6. Finding coherent subspaces

In the subspaces illustrated in Figure 2, the idea is that metaphor correlates with a mapping by which the angle between the source vector and the target vector is small, and the overall variances in distances between source vectors and respective target vectors is likewise small. This results in a convenient way of both visualizing and conceptualizing these cross-domain mappings as projections within projections, the constellation of word-vectors outlining the target domain being like a shadow of the configuration of points in the source domain cast by a light source located at the origin of the subspace. Since these subspaces are composed of statistics construed along concrete dimensions of co-occurrence as observed in a corpus, we can interpret this phenomenon mathematically in terms of sets of dimensions with comparable relative probabilities of co-occurrence for source versus target terms. This means the ratio of co-occurrences for a source and target

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word with a particular term should be relatively consistent with the ratio of sums of co-occurrences across all terms delineating the dimensions of a contextualized mapping. In mathematical terms, we are trying to find the set of d co-occurrence features c that minimize the variance in the ratios of the co-occurrence measure M from Equation (1) for a given source word w_s and target word w_t:

$$\sum_{j\times 1}^{d}\left(\frac{M(w_s, c_j)}{M(w_t, c_j)} - \mu\left(\frac{M(w_s, c)}{M(w_t, c)}\right)\right)^2 = 0 \qquad (2)$$

Here, c_j indicates any one of the d co-occurrence features in the subspace projected to represent the contextual emergence of a metaphor, and μ indicates taking the mean of the ratios of the measures M for source word to target word for all such features.

This formalism will be useful when we consider how we might go about solving the problem of systematically specifying the context of a metaphor in terms of co-occurrence statistics. More generally, the geometry of an appropriately configured subspace captures the semantics inherent in relationships between lexical representations. In the case of a mapping from a source to a target in one of these spaces, we can say that there is a specific direction, distance, and orientation associated with the metaphoric move from one conceptual domain to another, and these features in turn correlate with a probabilistic tendency in terms of the way that language has been observed in use.

One important thing to note about all the plots in Figure 2 is that the co-occurrence dimensions that form the basis for these mappings have an evidently random character. One would not instinctively guess, for instance, that co-occurrences with the words (*sunny, man's, brave*) had something to do with a structured mapping from the domain of COLOUR to that of AFFECT. What we must bear in mind, though, is first of all that these dimensions collectively represent a tendency in language use, and so should not necessarily be interpreted independently. Instead of thinking of the dimensions defining a concept-specific context as a set of labels denoting relevant conceptual properties, we propose that these dimensional tags should be taken as in some sense collectively topical, and potentially in ways that are apparent in the overall dynamic of dimensions rather than in the aggregate of individual dimensions. In this regard, we present our framework in alignment with the pragmatic perspective on metaphor as a lexical specification in response to a context in an environment rather than as a structured mapping between persistent conceptual representations.

The second thing to appreciate with regard to the definition of a contextualized subspace is that the examples illustrated in Figure 2 have been projected into just three dimensions, and the decision to use such a low number of dimensions was taken purely for the sake of visualizing the way that metaphoric relationships

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play out in terms of geometric mappings. We can at least in principle, though, select arbitrarily large numbers of dimensions for our projections, and a reasonable hypothesis would be that, as we move into higher dimensional subspaces, the mappings between our conceptual regions of word-vectors become more discriminating, because we can select a profile of dimensions that weeds out more of the noise which creeps into mappings in lower dimensional projections. As we increase the dimensionality of a subspace, we might expect the set of co-occurrence features defining the subspace to take on a conceptually coherent characteristic: with the ratios of lengths of source and target word-vectors spread out across a larger number of dimensions, there is more room for discovering co-occurrences that are specific to components of the context in which the metaphor is generated.

Table 1. Mappings, angles, and labels of axes for eight dimensional subspaces of the same metaphor generating projections described in Figure 2.

Source	Target	Cosine	Dimensions	Source	Target	Cosine	Dimensions
blue	sad	0.96	*beautiful, sees,*	down	bad	0.97	*toughness, to,*
yellow	scared	0.94	*girl, confused,*	up	good	0.96	*it's, feeling,*
red	angry	0.90	*staring, looks,*	above	superior	0.95	*rating, bone,*
green	jealous	0.92	*upset, pretty*	beneath	inferior	0.95	*vein, nerves*
knife	scalpel	0.91	*performed, arm,*	book	brook	0.89	*referring, is,*
shop	hospital	0.96	*nose, removed,*	tongue	tree	0.92	*bear, beneath,*
butcher	surgeon	0.90	*stanley, safety,*	sermon	stone	0.93	*creates, trees,*
meat	patient	0.89	*informs, warren*	life	nature	0.98	*green, itself*

This expectation bears out to at least some extent in Table 1, where the same four metaphors explored in Figure 2 are reconstructed in eight dimensional subspaces. Here *cosine* measures the angle between source and target, with scores of zero indicating the two vectors are at right angles while scores of one point to perfect alignment. The consistently high cosine scores suggest that these higher dimensional spaces are still doing the generative work of mapping source to target, while the dimension labels associated with each projection now take on an at least qualitatively more coherent aspect. The dimensions associated with the COLOUR to AFFECT metaphor, for instance, are indicative of vision, aesthetics, and emotions, while the dimensions for the SURGERY to BUTCHERY mapping are, taken collectively, about doing things to bodies.[4]

4. The presence of the presumably decapitalized proper names stanley and warren is intriguing, if not immediately explicable – though a basic search of the underlying corpus, which

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In these cases, the eight dimensions have been selected from all the possible combinations of just the top 25 dimensions in terms of mean co-occurrence statistics for the words involved in the metaphor: as the number of dimensions involved in a projection increases, the computational cost of computing all combinations of that cardinality from a base set of dimensions expands exponentially.[5] This means that there might be scope for discovering even more productive combinations of dimensions amongst a broader set of base co-occurrence dimensions. More to the point, though, it also raises the important question of whether there might be a way to systematically predict the subspaces in which particular metaphorical mappings will unfold. More than just overcoming the well-established problem of combinatory searches through high-dimensional parameter spaces, this would point the way towards a truly generative model, where simply the representational components combined with a conceptually anchored input that correctly contextualizes these representations provides the basis for a projection and a corresponding mapping coupling target word-vectors with metaphorical source word-vectors.

One way forward would be to treat metaphor generation as a machine learning task. So, for instance, given a target such as *surgeon*, a context such as *reckless*, and a set of attributes associated with the target such as *scalpel* and *patient*, we could seek to train a model to learn to pick the co-occurrence features defining a subspace in which the vectors within the domain of SURGERY map to the corresponding points within the domain BUTCHERY. This would constitute a *supervised* machine learning problem, in that we would train the model based on a set of known cross-domain mappings, coupled with keys indicating the context in which these particular mappings are activated. This research would therefore entail the development of a fairly large dataset of such annotated mappings, which is not a trivial undertaking, though work on cataloging metaphor described by, for instance, Steen et al. (2010) and Stickles et al. (2016) offers a good starting point. The model itself could take the form of a neural network, and the criterion for defining a good mapping outlined in Equation (2) presents a candidate objective function.

For now, returning to the theoretical objective of exploring a computational implementation of a pragmatic account of metaphor outlined in Section 2, we suggest that the prospective methodology we have outlined here could be

is to say, Wikipedia, does indeed indicate various surgeons known by either name, and various other axes of association between these names and numerous senses of the word butcher.

5. There are 1,081,575 ways to choose 8 dimensions from a set of 25 dimensions: the curse of dimensionality is still at play here, if not at quite the same scale as when projecting arbitrary subspaces from a base space of 8 million dimensions.

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construed as capturing the way that *ad hoc* concepts are formed in the process of metaphor generation, in response to a particular context in an agent's environment. The particular arrangement of the word-vectors associated with, for instance, BUTCHERY or EMOTION in the source domains illustrated in Figure 2 indicate a context specific projection of those concepts, and one which facilitates a productive cross-domain correspondence. The curse of dimensionality remains a factor here, in that there are a very large number of ways to rearrange the semantic geometry of a collection of lexical representations, but this has to be the case: we must allow our methodology for discovering metaphors to be open-ended in the way that different situations specify different extemporaneous conceptual constructs. We have so far demonstrated that there are some steps that can be taken to reduce the immensity of the space of possible semantic projections based on a set of inputs. Whether we can systematically identify a methodology for representing context and then identifying the particular subspaces in which a specific context is resolved into a set of geometric relationships that can be acted upon as the basis for linguistic communication remains to be seen.

7. The way forward

It is important at this point to consider ways in which a methodology such as the one we've proposed might be quantitatively evaluated. One approach to evaluating metaphor generation might involve a statistical analysis of the correlation between the words involved in a novel construction and the anticipated effect of those words, as Veale and Hao (2007) have done for similes. This is an interesting and relevant way of examining the impact of figurative language, but it doesn't really tell us about the way that this type of language operates as a mechanism of communication. Alternatively, Miyazawa and Miyao (2017) have proposed to crowd-source human assessments of computationally generated metaphors in terms of metrics such as *novelty* and *comprehensibility*. This grounds a system out in a real-world judgement of the degree to which a metaphor accomplishes the task of communicating a proposition in a new way, but it tells us nothing else about how metaphor operates in a particular communicative context.

If we are to take seriously Davidson's (1978) idea that metaphor is not strictly to be assessed in terms of the success of a non-literal construction in conveying propositional content, we can't even really query a pragmatically motivated system's output in terms of entailment: when an agent constructs a metaphor, they are doing something aside from, or more than, simply saying that something is a certain way in the world. From this point of view, it seems it will be necessary to develop an approach to measuring the consequence of an expression in a

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particular circumstance, beyond simply determining whether propositional information has been effectively communicated. It seems inevitable that, in order to evaluate the context-sensitive generation of metaphor, we will need to devise a way to place the evaluator directly into the particular context in which the metaphor has come about. What this would involve, and the degree of immersion necessary to really evaluate the system, depends on how exactly context is defined, a question which is fundamental to everything that has been said here. The interpretability of the mechanisms of the methodology outlined in the preceding sections might offer some leverage in terms of providing insight into the operation of the system, something which is a factor for artificial agents in a way it is not for humans.

It is also worth considering how we might establish a baseline as a point of comparison to any system designed based on the methodology outlined above, and here we should note that a new generation of context-sensitive distributional semantic models have emerged which seem ripe for application to non-literal language. Using, for instance, bi-LSTM (Peters et al., 2018) or transformer architectures (Devlin et al., 2019), massively deep and wide neural networks learn to project word representations into a semantic space that is colored by the context of an actual sentence in which the word is observed. On the surface, models such as this would seem to do something very similar to what we are grasping for with our proposed methodology. But, while some valuable work has been done to explore the geometries of these types of models and the ways in which representations shift in context (Ethayarajh, 2019), the question of how these approaches might push words into geometries that can be interpreted in terms of context sensitive departures from literal lexical interpretations remains open.

So, in terms of next steps, we would propose first of all considering a robust approach to evaluating the way that metaphor comes about in a particular environmental context, and then exploring ways in which both output and process can be examined in order to assess the operation of a metaphor in a situation. These are substantial research objectives in themselves, and in addition to the significant work that remains to be done in refining the broad methodology proposed here.

8. Conclusion

For the time being, we will have to consider the prospect of a comprehensive computational metaphor generating system described above as a target for future work. The methodology for mapping sources to targets outlined in this paper has, we hope, put some of the fundamental apparatus for such a system in place, but there are still a number of questions regarding the technical particulars of the approach. Model parameters range from the way in which words are represented

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(should they be lemmatized, for instance, or endowed with syntactic information?) to the way that frequentist statistics are weighted in our base matrix (is the information theoretic measure used to obtain the case studies outlined here the most appropriate one?). The establishment of the features of the relationships between the vectors associated with input words and the candidate dimensions for contextually projecting these vectors bears a great deal more thought, and indeed the selection of the underlying data itself is a question requiring careful theoretical consideration.

As things stand, we have endeavored to present a procedure that demonstrates the tractability of spaces of statistically grounded semantic representations as geometric models of the process of metaphor generation. To anticipate one potential and reasonable theoretical objection to the framework we've outlined here, much of the work seems to be happening on the surface of language, by way of the interaction of representational forms without necessarily communicating with associated cognitive processes that bind these forms to non-linguistic modes of being in the world. Ultimately, important reservations have been raised by, for instance, Chomsky (1957) about the very idea that much of what is inherent in language can be gleaned from the statistical data about how words have been used, and we acknowledge that there is much to word meaning which is simply not in the words themselves. This is a valid point, and we would be remiss to argue that the intentional and indeed phenomenological properties that have, at times, been associated with metaphor use could in any comprehensive sense be captured by a model based on our methodology. Ultimately, it is at least admissible to surmise that the contextualization component of our methodology in particular will have to fall back on information that comes in some sense from outside the statistical data about language use. There is, to put it concretely, something in the lived-in experience of the world that differentiates bad surgeons from, say, bad barbers, and this distinction has significant implications for the way that metaphor might be applied.

Nonetheless, we maintain that there is something desirable in the application of statistical geometry in performing mappings between semantic domains. The first desideratum has been a core theme of the description of our methodology above: by seeking semantics in a geometry of quantitative lexical representations, we likewise effectively map the operation of our methodology to underlying claims about the way that language is observed in use, and so pin it at least in a general sense to the primary criterion we have for talking about what language is used for and how it works. We have remained intentionally vague about what these claims might actually be, but we would like to create a framework for exploring the pragmatic commitment that language is in some sense in the world as much as it is in the head. A requirement of such a framework would be a mechanism for the

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ad hoc generation of concepts, in a process where language is both an expressive product and also a productive source of the situational specification of meaning. This process can be particularly evident in the case of metaphor generation, where extemporaneously constructed concepts can vary in surprising ways from the prototypical or stereotypical versions of those concepts.

As we have mentioned, the project of devising a computational framework for lexical pragmatics is an ambitious one: this area has typically been viewed as recalcitrant to computational modelling, not least because it deals with the inherent messiness of being an agent in a chaotic world, and there being something it is like to be such an agent. We propose that, by cautiously considering the rampant recombinability of high dimensional spaces, we might discover a basis for using statistical analysis as at least a simulacrum of the complexity of the world. In the cases illustrated above, based on the weightings used to build our base matrix and the nature of the mappings from source to target domains, the methodology is picking up on something about consistencies in relative probabilities between coupled representations as well as across sets of these couplings, but there is no reason we can't consider any range of other hypotheses about what tendencies in language use, or indeed complex interrelationships between tendencies, might be associated with metaphor. We will simply note that it is probably desirable to consider models where the features of representational structures are in some sense interpretable: this will facilitate training a system to make the selections necessary in order to project contextualized versions of these representations.

The second desideratum regards the construction of a framework that permits the notion of perceptual affordance to play a role in the modelling of linguistic flexibility, something we touched on at the end of Section 5 when we discussed the perceptual immediacy of modelling metaphors geometric features. By designing a methodology in which conceptual regions can be mapped to each other through congruences in their directly observable geometric situations, we can begin to see a way towards generating metaphor without necessarily having to do the more cognitively expensive work of simultaneously interpreting metaphor. This is visually obvious in the examples illustrated in Figure 2, where we can simply see that the source domains project themselves neatly onto the target domains, and this observation extends intuitively to higher dimensions, where this visual immediacy can be generalized in terms of some very simple formulations regarding angles and distances. Our claim is that this methodology for projecting spaces in which metaphors play out geometrically instantiates a theoretical commitment that metaphor can be described as the direct perception of an opportunity for meaning-making in a specific cognitive environment.

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Under this regimen, metaphor becomes not just a mechanism for codifying propositional content about the world in ways that are by turn aesthetically appealing and communicatively efficient, but also an instance of humans using words in the same way that they use other entities, however material or immaterial they may be, found in their environments. Just as a shoe can become a hammer or a newspaper can become a fan without the agent deploying these implements in those ways thinking too much about it, a word can become a device for showing not just what but how a communicator is cognitively experiencing their situation. This does not dispense with the notion of metaphor as a property of the productive and often systematic cognitive coupling of conceptual domains; on the contrary, unless we choose to likewise dispense with the idea that language is tightly coupled with cognition, this becomes another piece of evidence in the ever more clear picture that words offer great insight into the working of the mind. In fact, we would like to believe that our methodology, to the extent that it offers a way of seeing how concepts that come about contextually can still be subject to cross-domain mappings, and how furthermore statistics about language use can become the basis for the geometry in which these mappings unfold, can be an important component in the application of computational techniques to the study of the relationship between language, humans, and the world.

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Mind the gap

Expressing affect with hyperbole and hyperbolic figures

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Hyperbole is traditionally understood as exaggeration. I argue instead that the point of hyperbole is *emphasis*. By overstating that things are *greater* (*lesser*) than expected, hoped, or desired, we shift the salience of the target property, thus making it more emphatic. This enables to express surprise or other relevant affect in reaction to how much, or how little, our expectations have been either exceeded or thwarted. This purpose is well suited to hyperbolic expression. This is because hyperbole naturally draws a contrast between how things are and how they were expected to be, exaggerating the gap between them. I conclude by considering the characteristics of hyperbolic figures where hyperbole mixes with other figures of speech.

Keywords: hyperbole, salience-shift, affect, metaphor, irony, hyperbolic figures

1. Hyperbole and exaggeration

Humans have a tendency to exaggerate. Not all exaggeration is hyperbole. Sometimes the exaggeration is merely error. Sometimes the purpose of exaggeration is to deceive. A speaker may be aware of this deception, or may also seek to convince himself. On yet other occasions the purpose of the exaggeration is not to deceive, but to convey a point in an emphatic manner.

In hyperbole, the speaker inflates some aspect of reality, but is transparent about this inflation. Consider the following five utterances made by fans of Taylor Swift. The background to these utterances were that these people visited her house:[1]

1. These are read out on Graham Norton Show: https://www.youtube.com/watch?v=7jLWyenqY5Y

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(1) "We were asked to go into the living room and sit down you do not know how much I was sweating during that moment, I was like da fuq is gonna happen my poor heart could not keep up, then all of the sudden she just pops up out of nowhere she appeared out of thin air like David Copperfield and *we all died like for real*."

(2) "So she says she will be playing her album for us let me tell you the noise that came out of my mouth was not human *I legit almost told mama swift to call me an ambulance cause I wasn't going to make it*."

(3) "So then we took a little break to stretch our legs and she was passing around rice krispie treats and cookies and I was talking to her Mom for a little and then I walked back in and she was like 'hey babe thanks for coming, do you want a treat'. *And I was like I would but I think I'm dead*."

(4) "Mid-sentence she stopped talking and pointed to Amanda and said, 'Amanda! I'm so glad that you're here!' *Amanda died. Right there. Died*."

(5) "Guys just wait for the one she did with Imogen Heap cause damn. That one slayed everyone to heaven and back while listening to the song *I literally had to plan my funeral arrangements cause I wasn't going to make it"*.

These are instances of creative, juicy hyperboles, albeit displaying quite dark images of trauma and death. In neither case, however, do the fans expect their listeners to take them literally. Rather, they build on the emotional and imagistic potential of the scenario of death and trauma in order to express the extent and intensity of their thrill that exceeded far more their expectations. This works as a colorful package, blending a mix of extreme experiences. As Graham Norton says, "it's borderline confusing whether they had a good time or not". But the message is clear: they did not have just a good time; they had a whale of a time.

Why choose hyperbole over a literal message? Hyperbole is more rewarding cognitively and emotionally. It has more impact and potential to grab attention in a fun and surprising way. It's rewarding for listeners too: it's much more evocative and eye-catching than just a bland "I had a great time". There is an element of dramatic performance in a well-crafted hyperbole in that the speaker is presenting things as grander, or more terrible, than they actually are. The very choice of words used as a vehicle will determine how much grand or how terrible things really are: the more hilariously ridiculous, the better.

That is useful for two reasons. For one, it indicates that what is said is not to be taken literally. For another, it widens the gap between how things are portrayed to be and how they really are, and how the speaker feels about this gap. Admittedly, some of the expressions used in (1) through (5) are metaphorical in flavour (say,

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to convey a terrible experience),[2] and as such they elicit powerful emotions, even though that they are to be taken further in a different direction. The general pattern seems to be a shift in magnitude from saying something negative and morbid to meaning something overwhelmingly positive and exhilarating.

What drives this shift and what is ultimately the speaker's goal in speaking hyperbolically? Clearly, in being hyperbolic one does not mean what one is saying literally. Instead one is overstating the gap between how things are portrayed to be versus how they were expected to be, in order to show how much expectations have been exceeded, whether in positive or negative. This brings into prominence the target property the speaker cares to talk about in a colorful, evocative way. The result is an entertaining way of making the target property more salient and expressing a relevant affect depending on whether the speaker's expectations have been surpassed or thwarted. What's the argument?

In a nutshell, I argue that the essence of hyperbole is to increase the salience of the target property, thereby making it more emphatic, and expressing an attitude about it. Key to this is overstating the gap between what one says and how one would have expected things to normally turn out. This in turn has the correlative effect of increasing the gap between how things actually are and how they were expected to be, with a view to showing how much the former exceeded the latter. As a result, the target property becomes much more in focus than if it were expressed literally. Correlatively, by increasing the gap between reality and expectations, the speaker is also expressing a range of more colourful affective responses that are typically associated with surpassed or thwarted expectations. The bigger the gap, the more intense the affect expressed, because reality is less conforming to expectations. The smaller the gap, the less intense the affect will be, because reality is more conforming to expectations. Let's unpack the key ingredients in a systematic way.

2. What's in hyperbole?

It is commonly agreed that hyperbolic speakers overtly signal that they *say more than they mean*, or they *say less than they mean*, and want hearers to recognize this. Walton (2017) and Carston & Wearing (2015) have recently made proposals as to how hyperbolic exaggeration is achieved. As Carston & Wearing (2015, p. 85)

2. Since the metaphors are here dead metaphors, we can forego the details of what happens in cases where metaphor and hyperbole are combined (I briefly touch on this in Section 5).

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note, hyperbole requires that there is *more*, or *less,* of a property *F* than was wanted or expected.

To identify and evaluate the target property *F* that the speaker cares to talk about, we first need to set out a *relevant scale* for measuring *F* in a given context – call it *F-scale*. This can be a scale appropriate for measuring quality, quantity, length, weight, distance, time, intensity of affect, etc. To generalize, the target property *F* is a gradable concept which can be measured along a relevant scale. Notably, *F* need not always be encoded in the expression used hyperbolically, but can be accessed contextually. For example, when I say:

(6) Last night a whole army of mosquitos was feasting on us.

(7) We had so much food at the party we could feed the entire Roman army.

the property at issue here – the number of mosquitos, and respectively the quantity of food at the party – is accessed indirectly by inferring from general world knowledge related to the idea of "Roman army", or the metaphoric use of "army of mosquitos".

Second, in order to measure the target property *F* we need to establish the relative distance between a few key points on the *F*-scale. Our first point corresponds to what the speaker says or how things are portrayed to be. The second point corresponds to how things are or what the speaker means to get across. Now, it is well agreed that there is gap between the two (at least they are not identical), with the former point being higher, or lower, on the scale than the latter. The prime question for us is how much higher, or how much lower, and how to calculate the distance between them.

Carston & Wearing note that *F* is more, or less, than was wanted or expected, but don't provide a metric of how to calculate this gap, in particular how to move up or down on the scale with respect to what is said in order to figure out where *F* is on the scale. This gap will also be critical in figuring out what kind of affect hyperbolic speakers typically express and its relative intensity.

Walton (2017) offers a more sophisticated mechanism of scaling up the distance between what is said and what is meant, but doesn't say much about the characteristic affective evaluation. Carston & Wearing (2015) appreciate the affective evaluation that comes with hyperbole, but do not fully explore the mechanics of how that evaluation comes about. They are primarily concerned with characterizing whether the mechanism underpinning hyperbole is more akin to metaphor or irony. I'm not concerned with this question here. Instead I shall argue that hyperbole uses a shift in magnitude to make the target property more salient, thereby making a more emphatic point. The purpose of hyperbole is thus to express with force and colour that the target property is either greater, or lesser, than expected, hoped or desired, and thus express how the speaker feels about the gap.

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It's worth noting that similar attention to the idea of "scaling up" with its resulting affect has been developed in a cognitive linguistics framework. Ruiz de Mendoza and Galera (2014), Peña and Ruiz de Mendoza (2017) and Ruiz de Mendoza (present volume), use the notions of "strengthening a scalar concept" or "scaling up a gradable concept" in order to capture the underlying cognitive modeling of hyperbole as a result of mapping conceptual structure. They take the "source domain" or what I call the vehicle of hyperbole to be a virtually impossible (often counterfactual) scenario, and argue that this is mapped onto a real-world situation ("the target") or what the speaker means to get across. The impossible scenario, they argue, is constructed by "strengthening beyond proportion a scalar concept".

It's worth noting that whereas hyperbole typically makes use of a vehicle invoking unlikely situations such as "This suitcase weighs a ton", there are cases where this need not be an impossible or counterfactual scenario. For example, when I tell you about my 10k run that "It was literally a marathon", it's neither impossible nor counterfactual that my run could have been a marathon, though clearly the point here is to convey that running 10k was harder than I expected, perhaps as hard as it would be running a real marathon.

Also, critical to the conception of these authors is the idea that the central element in the hyperbolic mapping is attitudinal (conveying anger, frustration, awe, etc.). The attitudinal element in the "source domain" is used to reason about the corresponding element in the "target domain", thus magnifying its impact.[3] This is taken to require mental simulation.

This is an interesting explanation, but it's unclear how we move from the affect elicited by what is said to the attitude the speaker seeks to convey. Clearly, what we would experience emotionally in cases such as (1) through (5), were we to take the scenarios of trauma and death at face value, is sadness and sorrow. But this is not what the fans mean, and there is no clear way of moving from such negative affect to the positive affect of excitement and exhilaration that the fans express. More generally, the question arises as to what added value we bring by going to the trouble of considering the affect associated with the "source domain", and whether there are no other more direct means to retrieve the affect the speaker

3. Together with John Barnden, we've developed the idea of a "transfer" of affect from the attitude characteristically elicited by the vehicle of hyperbole (were one to take what is said literally), towards the attitude the speaker seeks to express. See Barnden and Popa-Wyatt (2012), Barnden (2017, forth). I am now less convinced that this is what is going on in hyperbole, and whether the former affect brings any significant cognitive benefit that outweighs the effort. The only affect-transfer that is relevant has to do with the force or intensity of the affect, as I explain below, but not with identifying the specific affect.

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is expressing. I shall argue that there are, and below I consider other resources that help us provide a more precise mechanism for measuring the target property *F*, together with the associated attitude.

Focusing on the shift in magnitude of *F*, and the corresponding affective evaluation, as the key ingredients in hyperbolic uses, I'll explain these by building on Walton (2017) and Carston and Wearing (2015), respectively.

3. Scaling up *F* and expressing affect

A key idea for Walton is that to convey how large a quantity is, is to exaggerate how small it is, and to convey how small a quantity is, is to exaggerate how big it is. This involves a particular direction of movement relativized to a relevant scale for measuring the target property *F*. Walton identifies various points on the scale that we need in order to measure the distance between what is said and what is meant. He first distinguishes between "*explicit content*" (EC) as the content presented (what is literally said), and "*assertive content*" (AC) as the content the speaker means to indicate that it is the case (what is meant).[4] Thus, in overstating, Walton tells us, the speaker is representing *F* as being either larger, or smaller, than what is really the case.

But to appreciate how much bigger, or how much smaller, *F* is, Walton introduces a further key point on the scale, which he calls "*salient contrast*" (SC). This amounts to what the speaker is especially concerned to rule out or to deny that is the case in a given context. What makes a contrast salient? This depends on what is normally expected or ordinarily the case in a given context – i.e. what the parties to the conversation are likely to expect given what is salient in the "conversational air" (sometimes even before an assertion is made).

Why should we care about the salient contrast, given that it's something the speaker is keen to deny? What is it a contrast to and how does it help us get to what the speaker *is* concerned to convey? Critically, the way I read Walton, the salient contrast is a contrast to what the speaker wants to get across: it's the thing you might have thought was the case, and you find out it isn't. It's a bit like when I say: "Don't think of an elephant", and you can't help but think of one. Why do we go to the trouble of recovering the salient contrast? Well, knowing where the salient

4. The question of whether the hyperbolic content is asserted or implicated requires more attention than I can give here, so I'll continue using Walton's terminology with the caveat that I'm not taking a stance here as to the semantics/pragmatics of hyperbole.

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contrast is on the scale is useful because it enables to scale up (or scale down) the gap between what is said and what is meant, by measuring the distance from each point to the salient contrast. What's essential to hyperbole, Walton argues, is that in the assumed conversational context the distance between what the speaker says (EC) and what she means to deny (SC) is *greater* than the distance between what she means to deny (SC) and what she means to indicate is the case (AC). In other words, this means that AC is a point in between EC and SC. This will come handy later on.

To see what this amounts to, let's work with a simple example. Consider the following case from Walton: I'm looking out of the window, and upon seeing a dozen policemen I say to my companion:

(8) There are *hundreds* of cops out there.

The speaker is clearly not expecting her companion to understand that there are literally hundreds of cops. Instead she is exaggerating how many cops there are in order to convey that there are significantly more than normal – say, there are significantly more than two and significantly fewer that 200. If we take EC to be corresponding to hundreds of cops on the relevant scale, then we can calculate the relative location of AC – namely, some point or interval on the scale that it is lower than EC, say, there are *quite a few* cops out there.

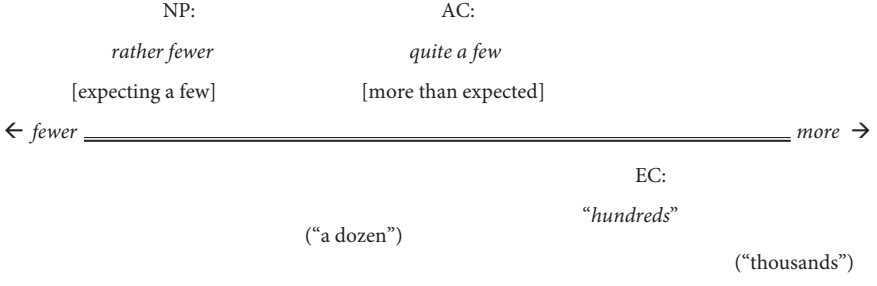
Why is it much more natural to think that the speaker is overstating how *large* the number of cops is, rather than how *few* there are? Walton says that it's more natural to assume that what's of interest in (8) is that there are as many cops on the street as there are – i.e. the *large* number of cops, rather than how few there are. So what the speaker is keen to get across is their abundance. Normally there are one or two or none, so what's salient here, insofar as it's unexpected, is that there are significantly more cops than normal. To express this sense of surprise, the speaker is portraying reality as way more inflated than it is. She exaggerates the gap between SC – how many policemen would have normally been on the streets (say, *fewer*) – and AC – how many they roughly turned out to be (say, *quite a few*), thus conveying that there are *quite a few* cops, *rather than fewer*.

What's the underlying mechanism? Essentially, in order to locate AC on the relevant scale, we need to determine how far up, or how far down, we need to move on the scale with respect to what is said (EC). But to determine this, we need an anchoring point with respect to which we can measure the direction of movement and the distance from EC to AC. Here is where the presence of the salient contrast is important. But instead of thinking of salient contrast as what the speaker is concerned to rule out, as Walton suggests, I want to think of it as *normative point* (NP) on the relevant *F*-scale, which captures the range of expectations,

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hopes and desires that are raised to salience only to convey that they have been either surpassed or thwarted.[5] This concerns what one would normally expect, hope or desire to happen, given what was said and what is generally known or salient, but which the speaker is keen to convey that it didn't happen. This need not be a specific expectation in the mind of a particular speaker/hearer, but rather a generally held base-line expectation that both speaker/hearer can understand as the normal or typical thing to happen in the circumstances. This means that conversational participants are able to easily recover such expectations from context and bring them to bear in reasoning about the point the speaker seeks to convey. This may be just a terminological variation on Walton's proposal, but I'll show that it enables us a better metric to position AC on the *F*-scale.

To illustrate, we can adapt Walton's schema by making room for the normative point on the scale, and representing the hyperbole in (8) as follows:



Key here is the idea that the gap between what speakers say (EC) and how they expect things to be (NP) is *greater* than the gap between how they expected things to be (NP) and how they turned out to be (AC). This is after all the whole point of exaggerating. In order to draw attention that reality is larger than expected, speakers exaggerate the gap between what they say and how they expected things to be. This results in a *shift in salience* of the target property: it's *more* (or *less*) than normal or expected, but it's *less* (or *more*) than what is said to be. This contrast helps to bring the target property into focus and make a more emphatic point about it.

5. This is different from Carston and Wearing's (2015, p. 84) idea of "normative bias", which, following Wilson (2013), they take to be fundamental of irony. In particular, it explains why irony tends to be negative, criticizing rather than praising. This is because irony can easily exploit socially shared norms about how things should be, in order to draw attention at how such expectations have been thwarted. Carston and Wearing (2015, p. 85) insist that because hyperbole can convey both positive and negative evaluations, it follows that it lacks a normative bias.

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Generalizing, we can think of the normative point as a counterpoint on the *F*-scale that helps locate how far up, or how far down, AC is with respect to EC. If EC is high up on the scale, we need to lower down AC, but in such a way that it's still higher than NP or what one would normally expect in the circumstances. If EC is low down on the scale, we need to raise up AC, but in such a way that it's still lower than NP or what one would normally expect in the circumstances. Thus, NP helps balance out where AC is with respect to both EC and NP. Note that AC need not be an absolute or precise point on the scale but rather a relative point that is located comparatively, either closer to EC or to NP. What matters is that even though what is meant is more (or less) than what is said (EC), it's still less (or more) than what would normally be expected (NP).

This means that in order to locate AC on the *F*-scale, we first need to establish the direction of movement with respect to EC (whether up or down), and then we need to modulate how far we go in that direction such that we are still within the confines of NP. This means not only that AC must remain between EC and NP, but also its closeness to either of them depends on how overstated the gap between EC and NP is. The bigger the gap, the bigger the contrast between expectations and reality is, and thus a greater sense of surprise the speaker is expressing. Conversely, the smaller the gap, the closer to the literal meaning we get and the less surprising it is. For example, compare two variations on (8):

(9) There were *thousands* of cops out there.

(10) There were *a dozen* cops out there.

The gap in (9) is bigger than it is in (10), and this correlates with different degrees of surprise that the speaker is expressing. Essentially, the more one's expectations are surpassed, or thwarted, the more forceful the affect expressed. The closer it is to what is expected, the less unsurprising it is because it conforms to one's expectations. Thus, saying something hyperbolically helps shifting the salience of what we mean to indicate, compared to making the same point literally.

The gist of hyperbole thus resides in conveying that things have turned out way better, or way worse, than what one might have expected, hoped or desired in the circumstances. This comparison is possible precisely because of the anchoring in the normative point, which enables to compare how things have turned out to be relative to how they were expected to be in the circumstances. In this way we are able to appreciate how much more the former exceeded, or conversely fell short of, the latter. This captures Carston & Wearing's intuition that the target property *F* which the speaker is keen to convey is more, or less, than expected or desired. When expectations, hopes and desires are surpassed, speakers will express positive affect: they may be surprised, amazed, thrilled, excited, or in awe. When

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expectations, hopes and desires are thwarted, they will express negative affect: they may be disappointed, dissatisfied, or complain.

This affective element is important because it is the reason why speakers go to the trouble of contrasting how things are, relative to how they were expected to be, in order to draw attention how much reality fell short of their expectations, or how much it surpassed them. This is what they primarily care to get across, in addition to conveying the magnitude of the target property. Walton doesn't explicitly address the affective evaluation in hyperbole, though it's compatible with his account, if we think of the salient contrast as a normative point on the *F*-scale, which captures thwarted or surpassed expectations, hopes and desires. There is a further consequence that falls out about the force or intensity of the affect expressed. In particular, using this method of scaling up the gap between what speakers say and what they mean, we can predict that the force of the affect expressed correlates with how big or how small the gap is between what they say (EC) and how things were expected to be but didn't turn out that way (NP).

We thus reached a richer understanding of what hyperbolic speakers are up to in *saying more than they mean*. Namely, they shift the salience of the target property to make a more emphatic point, and in doing so they express how they feel about the gap between how things are and how they were expected to be.

4. Context-relative scaling

So far, we saw that hyperbole involves evaluating the magnitude of a target property *F* along a relevant scale. This property may be positive or negative, but critically it is gradable. So, to assess how large, or how small *F* is, we need to move either up or down along the *F*-scale. As a rule of thumb, if what is said is high up on the scale, then what is meant would typically go low down on the scale.[6] Conversely, if what is said is low down on the scale, then what is meant would typically go high up on the scale. What results is a significant gap between what we say and what we mean. As I suggested above, what matters is not an absolute or precise unity for measuring *F*, but rather a comparative measure of the form: *F is more, or less, than expected or desired*. The bigger the exaggeration, the more forceful the affect expressed is likely to be.

6. Carston and Wearing (2015, p. 81) also point out that key to a hyperbolic use is that the description used is stronger than a "*weaker scaled-down description*" the speaker means to convey.

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Now, in order to implement a scaling operation in a given hyperbolic use, we have to take into account the contextual variation of the relevant scale.[7] For example, consider (11) (from Carston & Wearing), uttered by a small boy realizing that his bigger sister has been served a piece of cake that is slightly larger than his own.

(11) My piece of cake is *tiny.*

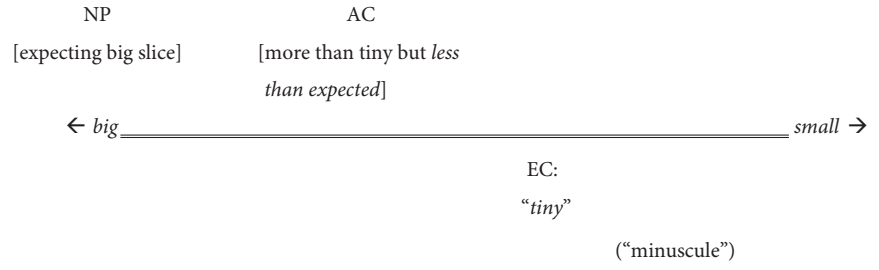
The boy regards the size of his piece of cake as smaller than he expected or wanted. He's obviously unhappy about this. What matters here is not that the size of his cake is small, because it isn't, but rather that it's smaller compared to that of his sister's.

What's going on here? In order to evaluate the size of the cake at issue we need to invoke a conceptualized scale for cake size. This scale obviously varies depending on the purpose at issue, here what the cake *is for*. Is it for a wedding?; for a 4-yr or a 10yr child?; for someone overweight?; or someone on a diet? Clearly, different purposes for cake eating come with different expectations about what the standard or ideal size is in each context. Now, for example imagine that (11) is uttered by a 4yr old boy, complaining that her 10yr old sister got a bigger slice. So, what the boy is doing here is shifting the context from a scale of <*cake-for-small-child*> to a scale of <*cake-for-big-child*>, so that when evaluating "tiny" with respect to the latter scale, what we get is an increased differential in the cake size that the boy hoped or desired and which he didn't get.

What results is a bigger gap between the size of cake that he says he's been served (EC) and the size of cake he would have liked to eat (NP), since by contrasting what he's got compared to the expected size on the <*cake-for-big-child*> scale, he indicates he should have got a comparatively bigger size (or at least as equal to that of his sister's). Thus, by drawing attention to this increased differential between how much he says he's got (EC) and how much he would have hoped to get (NP), the boy is emphasizing how much less cake he received. That's reasonable cause for complaint, and the bigger this gap, the more forceful his dissatisfaction. We can represent this as follows:

7. Cappelen and Lepore (2005), in a useful discussion on comparative adjectives (pp. 21, 22), discuss the reading of "That building is small." They state "… the building in question is not being said to be small for an object in general (whatever that may mean) (p. 21), implying again that the nature of such types of assessments as 'small' is uncertain. Lasersohn (2005) argues that ¨truth values of sentences containing predicates of 'personal taste' such as *fun* or *tasty* must be relativized to individuals." Perhaps comparative adjectives, additionally, should be included in such a group.

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Now, if the boy wanted to make his complaint even stronger, he could have used "microscopic", "minuscule", or "infinitesimally small" instead of "tiny". In this way, by overstating the gap between what is said (EC) and what was expected (NP) even more, he would have created a bigger gap between what he was actually served and how much he would have liked to be served, thus shifting the salience of the small size as a way of expressing a forceful dissatisfaction. Of course, the limits of extending this gap are subject to considerations of reasonableness in that the chosen scale of measurement must be appropriate to quantify the target property. Had the little boy said "my cake is a grain of sand", that wouldn't work as a reasonable measure to quantify cake size that would be believable. Hyperbole must be believable in its exaggeration, if it is to succeed.

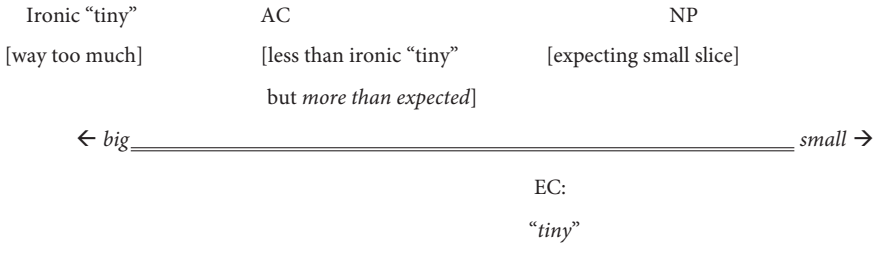
Shifting gears, imagine that I've told you I want some cake but also that I'm on a slimming diet. Now, when you bring me a full size of cake, I utter (11). Here again it's not the case that the cake is small; after all it's a normal size portion. It's just bigger than I wanted. So, if there is a sense in which I'm exaggerating, it's not exaggerating how small it is, but rather how big it is. This is because I'm ironic in addition to being hyperbolic. I don't mean what I say, but rather that you gave me a way too bigger piece of cake than I'd have liked or expected, in order to draw attention to how much this fell short of my expectations. What's the mechanism here?

As in the child's cake example, there is a context-shift in choosing the appropriate scale for evaluating the size of cake. Here we move from a <*normal-diet*> scale to a <*slimming-diet*> scale where a smaller piece of cake is expected and desirable, so that what counts as a normal size portion on the former counts as a big portion on the latter. This shift is brought about by pretence.[8] I pretend to be the kind of person who would find the size of cake that I've been served small in order to convey that it is in fact way too big. In other words, by evaluating "tiny"

8. Irony is explained by some authors as involving pretence. For various developments of pretence, see Grice (1975), Clark & Gerrig (1984), Walton (1990), Currie (2006), Recanati (2004), Colston (2015), Popa-Wyatt (2009, 2014, 2017, 2018), Barnden (2017, 2020), Ruiz de Mendoza (2014, 2020).

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with respect to the <*slimming-diet*> scale, what we get is a scaling down from the ironic "tiny" and a scaling up from the normative point corresponding to the fact that I was expecting a small slice. We can represent this as follows:



This shifts the salience of how much bigger the slice of cake was compared to what I expected or wanted. In addition to being hyperbolic, I also draw attention to how foolish one would be to take me at face value, thus complaining how insensitive the waiter was.

This shows that hyperbole is deeply contextual. The same utterance can be a hyperbole serving different purposes. This is because the relevant scale along which the target property is to be measured can vary with context. Relative to a context and the appropriate scale therein, different directions of movement along the scale are permissible to recover the hyperbolic point.

Thus, varying with context we can also see a variation in the nature of the affect expressed. We often hear people saying "I'm dead serious", or that something is "the best thing ever", "the greatest", "unbelievable", "jaw-droppingly great", "tremendous", "triumphant", and the like, as terms of praise designed to promote something as being slightly better than it actually is. We hear this way too often from certain politicians in the U.S., referring to America as "the greatest country on Earth", with the goal of selling an ideal image of America. We also hear pessimistic people for whom everything is "terrible", "the worst thing ever", "bad", "awful", and the like, and who thus seek to downgrade something as lower than it is. Such affective strategies are very effective rhetorical devices that serve to induce particular kinds of emotional responses in audience members.

5. Hyperbolic Figures

So far, we've looked at self-standing hyperbolic utterances – so-called 'pure hyperbole' – where hyperbole operates directly on the literal meaning of expressions to increase the salience of the target property along a relevant scale. There are, however, nice examples where hyperbole combines with other figures of speech

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within a single utterance. Carston and Wearing (2015, p. 81) list a wide range of possible combinations including hyperbole:

(12) That child is the devil incarnate. (hyperbole and metaphor)

(13) They go about together like Siamese twins. (hyperbole and simile)

(14) The gargantuan paunch over there is my step-father. (hyperbole and metonymy)

(15) It's the end of the world. (hyperbole and irony)
[describing someone's angry reaction when he finds he's got a parking fine]

(16) Those tickets cost an arm and a leg. (hyperbole and idiom)

(17) Money is the root of all evil. (hyperbole and proverb)
[in response to a situation in which someone has claimed a little more on their expenses than they were strictly entitled to]

What makes hyperbole so flexible in mixing with all sorts of figurative uses, as well as stock phrases like idioms and proverbs? My contention is that what makes hyperbole so versatile is that it's intrinsically evaluative in nature, and thus it can operate on any sort of property to make it more emphatic.

The question arises as to how these figures combine, what constraints they put on the interpretation of each other, and whether or not they a form a new encompassing compound that builds on both figures. I don't have the space to address these questions in details, but in Popa-Wyatt (2020) I argue that we shouldn't think of cases as in (12) through (17) as hyperbolic compounds along the lines of ironic metaphor – i.e. in the sense of a figurative compound where one figure builds on another.[9] Instead, I suggest, we should think of such mixes as hyperbolic figures in which the dominant figure is merely coloured with hyperbolic tinges. Here I'll confine myself to briefly laying out the characteristic features of hyperbolic figures, and unpack the implications they have.

It is very common for metaphor to combine with hyperbole. We often say of someone that she's a "saint", "angel", "star", "Maria Teresa"; that he's a "giant", "rocket", "dynamite", "towering figure", "devil", "genius", "Spartan", etc. These are hyperbolic metaphors because the metaphorical expressions have a hyperbolic quality in that they locate the target property either at a positive or negative extreme of the relevant scale. Thus, saying of someone that "*she's an angel*" conveys that she's very kind, good, and ready to help, more than anyone else, but not to an extremely high degree of helping with no fail. Thus, by placing metaphorical

9. See Popa-Wyatt (2009, 2010a, 2010b, 2020, 2017, 2018, ms), Carston and Wearing (2015).

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features at a high point on a relevant scale for measuring kindness, the hyperbole shifts the salience of those metaphorical features, making them more emphatic. How do metaphor and hyperbole work together?

One hypothesis is that metaphor and hyperbole mesh well because they differ in nature and purpose – metaphor is about a qualitative shift; hyperbole about a quantative shift – so they complement each other well when they combine. This insight has been developed in Popa-Wyatt (2009, Chapter 9). More recently, Rubio-Fernández, et al (2015, p. 24), Carston and Wearing (2015, p. 88) argue that "hyperbolic uses involve a shift of magnitude along a dimension which is intrinsic to the encoded meaning of the hyperbole vehicle, while metaphor involves a multi-dimensional qualitative shift away from the encoded meaning of the metaphor vehicle".[10]

Key to this conception is the idea that both metaphor and hyperbole are *descriptive* or *representational* devices. They are used to talk about some state of affairs in the world with a view to describing a situation by other means than literal. With metaphor, speakers describe how things are in the world by evoking similarities in thinking about one thing in terms of another. As a result, we can *see similarities* between distinct conceptual domains, thus seeing the world in a new, evocative light. With hyperbole, as argued above, the description of the world is exaggerated in order to convey a weaker evaluation. So hyperbole is fundamentally evaluative. This enables it to take as its object any description of a state of affairs, be that literal or metaphorical, which suggests that when combining together the hyperbole operates on the metaphor.

What's the role of hyperbole in the mixing and what kind of new figure arises out of this mixing? Let us consider a few more evocative examples:

(18) That surgeon is a *butcher*.

(19) Sara's bedroom is the *size of Cornwall* (Carston & Wearing 2015)

(20) You would have thought him a *basket of mulberries* (Aristotle's *Rhetoric*).

(21) His eloquence could *split rocks*.

What stands out here is that the metaphor is much more emphatic than had the speaker chosen a non-hyperbolic vehicle. For example, what we exaggerate in (18)

10. Carston and Wearing (2015, p. 89) also insist that in both metaphor and hyperbole the meaning is "lodged in the words", thus affecting the propositional content conveyed, and their interpretation requires an adjustment of the literal meaning of the target expression. However, they differ in purpose: "metaphor is a bid to give precise expression to a thought or experience for which there is no literal linguistic encoding, while what is fundamental to hyperbole is the expression of an evaluation (positive or negative) of a state of affairs".

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is that the surgeon is extremely incompetent;[11] in (19) that Sara's living arrangements were very spacious and comfortable; in (20) that the man had an immense black eye; and in (21) that the man's eloquence was remarkable. What are the constraints that undergird such mixing?

My contention is that hyperbole in these cases works as an interpretive effect, modulating the work of the metaphor, and thereby intensifying the characteristic metaphorical effects. Essentially, the hyperbole works by placing the metaphorical content at one of the extremes of the relevant scale in order to convey that the target metaphorical property is greater, or lesser, than expected or desired. Thus, by exaggerating the metaphorical features, the metaphor becomes more emphatic with hyperbolic tinges. The role of the hyperbole in the mix is to shift the salience of the metaphorical effects, rendering them more colourful and forceful than they would have otherwise been.

Now what about when hyperbole mixes with irony?[12] Their interaction works differently than in hyperbolic metaphor because both hyperbole and irony are evaluative. They are both in the business of expressing how the speaker feels about how things turn out compared to how they were expected, hoped, or desired. Where they differ is in the object of the evaluation: hyperbole involves an exaggerated evaluation of a situation or a state of affairs, whereas irony involves an evaluation of someone's thoughts, hopes and expectations with a view to ridiculing them. If both hyperbole and irony are evaluative devices, how do they mesh together?

Various people have noted that hyperbole works to facilitate the perception of irony in that it works as a cue to the speaker's mocking attitude (Kreuz & Roberts 1995, Wilson 2006, 2017, Carston & Wearing 2015). Consider again the case of hyperbolic irony in (11) – *This cake is tiny* – said in response to the waiter who served me a considerable size of cake, after I've told him I'm on a diet. Clearly, if there is a sense in which I'm exaggerating, it's not exaggerating how small it is, but rather how big it is. Hyperbole serves to exaggerate the claim literally expressed, making it less credible in the context so that it cannot be taken at face value. By heightening its ridiculousness, it thus function as a cue for the hearer to look for an ironic interpretation to the effect that I've been served way too much cake.

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11. The incompetence element in (16) has been discussed by blending theorists (e.g. Grady et al. 1999) as arising from integrating the butcher's way of cutting meat and the surgeon's operating on a patient into a single image.

12. For previous work see Colston and Keller (1998), Colston and O'Brien (2000), Colston (2013), Barnden and Popa-Wyatt (2012), Barnden (2017, 2020).

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The hyperbole serves here to lower down the ironic point on the scale so that it's less than what I meant ironically, but still more than what I hoped or desired. In this way, I convey my dissatisfaction by drawing attention to how much this fell short of my expectations.

More creative cases involve hyperbole deploying eccentric elaborated scenarios to produce an even more emphatic ironic point, as in the following excerpt from *Hitchhikers' Guide to the Galaxy*:

(22) "It is most gratifying that your enthusiasm for our planet continues unabated. As a token of our appreciation, we hope you will enjoy the two thermonuclear missiles we've just sent to converge with your craft. To ensure ongoing quality of service, your death may be monitored for training purposes. Thank you."

By exaggerating the sense of gratitude and contrasting it with a negative way of showing appreciation, the speaker creates a contrast of a magnitude that gives rise to humorous effects. Here the hyperbole serves to intensify the characteristic ironic effects, rendering them more colorful and forceful.

6. Concluding remarks

In this paper, I've argued that we can think of what hyperbolic speakers are doing in *saying more, or less, than they mean* in terms of a mechanism of shifting the salience of the target property to make a more emphatic point. This enabled a definition of hyperbole not just in terms of its function of exaggeration, but in terms of its other effects and purposes. I characterized its function as a shift of magnitude along a scale of measurement, together with the expression of affect about how speakers feel about the gap between how things are and how they were expected to be. In terms of its effect, it uses this magnitude shift to make the target property more salient. We've seen through examples that the key purpose of hyperbole is to express with colour and force that the target property is either greater or lesser than expected or desired. Finally, when hyperbole mixes with other figures, it works by magnifying the characteristic effects of the figure it operates on.

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Figurative language

Relations and constraints

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The present paper discusses two aspects of the production of figures of speech. The first one is their relatedness, which is established on the basis of an analysis of their cognitive configuration in terms of combinations of cognitive operations. Such operations are applied to the creation of basic figures of speech such as metaphor, metonymy, understatement, overstatement, irony, paradox, and oxymoron. Other traditional figurative uses of language are then accounted for with reference to these more basic ones. The second aspect that this paper addresses is the question of constraints on figurative thinking. In this respect, it reviews previous proposals on the topic and extends their application to other cases of figurative language use. The resulting account links figurative language up with the notion of embodied cognition.

Keywords: cognitive operations, constraints on figures of speech, embodied cognition, figurative language, figures of speech, pragmatic inferencing

1. Introduction

Over the past three decades, there has been extensive research in Cognitive Linguistics on metaphor and –although to a lesser extent– on metonymy, with important developments in the understanding of the role of the two phenomena in linguistic structure, communication, and cognition, despite definitional controversies (see the overviews and critical discussion in Barnden, 2010; Dirven & Ruiz de Mendoza, 2010; Gibbs, 2011; Benczes et al., 2011; Ruiz de Mendoza & Pérez, 2011; Gonzálvez et al., 2013; Littlemore, 2015; Gibbs, 2017). A breakthrough in the cognitive-linguistic approach to metaphor theory has been the understanding of its embodied nature, for which there is a growing amount of empirical support (cf. Gibbs, 2006; Wilson & Gibbs, 2007). In this approach, metaphor is not seen as a deviant use of language, but as an ordinary one rooted in the way our brains perceive and interpret our interaction with the world.

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For example, it is easier for the brain to think of non-physical causation in terms of physical causation than in abstract terms. Thus, we see the logic of argumentation as a physical force: *His line of reasoning forced me to a different conclusion*. In turn, metonymy, which is usually described in terms of one concept providing a point of access to a related concept within the same functional domain (cf. Barcelona, 2003), has been similarly argued to lie at the base of how we experience the world, although in terms of perspective (cf. Gibbs, 1999). For example, in the idiomatic expression *put his heart* (e.g. *He put his heart into his business*), which involves a metaphor (A BUSINESS IS A CONTAINER OF OUR EFFORTS) the word *heart* is used in its metonymic sense of 'intense effort'. But this expression conveys more than this. It suggests high personal involvement originating in strong emotions and desires. Both effort and emotions are experientially associated with the heart since our hearts beat faster during exercise and the heart is in the chest area where we experience many of our feelings. In other words, the use of 'heart' in this expression is intended to make us view its metonymic target ('intense effort') from the perspective of how we feel, physically and emotionally, when we become heavily involved in a task. It goes without saying that this metonymic use of 'heart' takes place within the metaphorical context of placing objects into a container.

The philosophy of embodied experience in language has rescued metaphor and metonymy from the scholarly tradition where these two phenomena were treated as "figures of speech" whose main purpose was artistic or rhetorical effect. Evidence of this tradition is Jakobson's inclusion of a "poetic" function of language in his account of communicative functions. The poetic function focuses on "the message for its own sake" (Jakobson, 1960, p. 356). However, while metaphor and metonymy readily lend themselves to the production of elaborated aesthetic effects, this is not necessarily their main function. Consider an example of literary use of the "heart" metaphor: *Kurtz's life was running swiftly too, ebbing, ebbing out of his heart into the sea of inexorable time* (Joseph Conrad, *Heart of Darkness*, Chapter 3, p. 14). Underlying the aesthetic effect of this literary elaboration is the common understanding of life as a fluid and of the heart as a container. There are everyday expressions where life is treated as a fluid substance inside a container: *He's full of life, My job has drained the life from me, Mars is empty of life*. Likewise, there are everyday expressions where the heart is treated as a container, usually of emotions, character traits, or desires: *His heart is full/empty of love, His heart swelled with pride, There is a different dream in his heart*. In Conrad's literary elaboration, however, the two metaphors combine into one, life being envisaged as a fluid that can flow into or out of a container, the heart. Furthermore, this combination is enriched by picturing the fluid as tidewater that can move away from the

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land into the sea, which still combines with another metaphor where time is a sea that swallows up the tidal water (which is Kurtz's life).

The fact that metaphor and metonymy are not mere rhetorical or literary devices should have naturally led cognitive linguists to wonder about the possibility of other figures of speech enjoying a similar status. However, the question has not actually been raised and the label "figurative language" is generally equated with metaphor and metonymy. An example of this is the (purportedly introductory) large-scale treatment of "figurative language" provided in Dancygier and Sweetser (2014), which simply contemplates metaphor, metonymy, and simile. Evidently, at some point cognitive linguists should come to terms with this weakness in accounting for figurative language. One important step for this goal would be to find out to what extent figures of speech relate to one another. The crucial questions in this respect are: are figures of speech related to one another; if so, in what way and how can similarities and differences be systematized? The response provided here will be based on an analysis of the cognitive operations involved in making meaning through figurative language. A second step is to know the extent of application of such cognitive mechanisms for meaning construction. This calls for an account of constraining factors on the production of figures of speech. So far, within Cognitive Linguistics, the only well-known account on constraints is the highly programmatic one provided by Lakoff (1990, 1993) under the label of the Invariance Principle (IP), which was only intended for metaphor. Other less known proposals on constraints, also programmatic, have been provided in work by Ruiz de Mendoza and Galera (2014). These hold for metaphor, metonymy, and hyperbole. But, as noted above, a broader account is needed. In what follows we will first provide an outline of an encompassing theory of figurative language use. Then, we will make explicit some of the constraints on the use of figures of speech following well-defined principles. Before we proceed, however, a word of caution is necessary. Providing a complete account of figurative language is a mammoth task that clearly exceeds the possibilities of one research paper. The purpose of the present paper is only exploratory, which means that further work will be needed, either along the lines put forward here or along completely different lines.

2. The analytical tools: A thumbnail account

This section will provide readers with a succinct (and somewhat revised) description of previous work on the role of cognitive operations in meaning construction as reported in Ruiz de Mendoza and Galera (2014) and Ruiz de

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Mendoza (2011, 2017a). Emphasis will be made on the relation of cognitive operations and figurative language. It should be noted that this account is made from a linguistic perspective.[1]

2.1 Cognitive operations: Definition and types

Central to the thesis of this paper is understanding how "cognitive modeling" takes place. Essentially, cognitive modeling is the process of building in our minds interpreted representations of the world of our experience with a view to thinking, reasoning, and communicating with others. It involves the activity of cognitive operations on pre-modeled conceptual material (or cognitive models) which is thus the object of further modeling. A cognitive operation is any mental activity with an identifiable effect resulting from brain's response to human interaction with the world.

The literature (e.g. Anderson, 2010) cites cognitive operations of various kinds which can arguably be grouped into at least three broad categories (see Ruiz de Mendoza, 2017a):

a. *Concept-building operations*. These operations include pattern recognition, mental imagery manipulation, and various coding and decoding processes (e.g. through touch, vision, hearing). The activity of these operations results in the creation of internally organized bodily-based knowledge stores, which we traditionally call concepts.
b. *Sensory-motor operations*. These operations, which involve motor programs and their execution, underlie the bodily aspects of people's interaction with the world. Because of their bodily nature, they are part of the motor-sensory input for the creation of concepts by means of the operations mentioned in (a) above.

1. In consonance with the previous studies, there is no claim as to the specific aspects of psychological activity involved in each cognitive operation in their combination with others. This is a complex issue that should be the object of future experimental research. But this kind of research is likely very challenging, since it should be able to isolate each operation from others with which it combines. Even if an experimental design is capable of isolating two operations for comparison, the nature of the tasks needs an extremely tight control. For example, on a superficial level of analysis, one could assume that operations involving cross-domain correspondences may involve more brain activity than those involving the expansion or reduction of a concept. But this ultimately depends on how many correspondences are at work in a given processing task and the degree of expansion/reduction required for a given cognitive task. These observations naturally affect the production and processing aspects of figurative language use differently. The experimental design should also be able to determine the amount of brain activity invested in either aspect.

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c. *Representational operations*. They result in the production of constrained representations. They can be divided into *construal* and *inferential* operations. The former operations relate to the brain's ability to give more prominence to some aspects of reality than others (e.g. focalization, foregrounding) or to impose its own bodily-based mental architecture on reality (e.g. fictive motion, as discussed by Talmy, 2000). The latter, by contrast, work on pre-existing knowledge stores (and the analysis of relevant contextual elements) to produce inferences.

Our attention in this paper is directed to inferential cognitive operations, which are explained in the next subsection. These operations are directly responsible for the derivation of implicit meaning effects. They thus underlie the various kinds of inferential meaning reported in the pragmatics literature: implicature, indirect illocution, and figurative language. In this paper, unlike in the previous literature, we focus our attention on those aspects of cognitive operations that bear upon constraints on figurative language.

2.2 Inferential cognitive operations

What scholars have traditionally termed pragmatic inference is arguably the result of combinations of well-defined cognitive operations. In Cognitive Linguistics, Lakoff (1987) and Gibbs (1994) allude to the metonymic nature of some cases of implicature. For example, in the context of the question *How did you go to the airport?*, the sentence *I waved down a taxi* supplies a point of access to the everyday scenario of taking a taxi. A taxi can be asked to stop by waving one's hands. When taxis stop, customers get into them, communicate their destination to the driver, and so on. Since what is said explicitly is only part of the more complex scenario, which is used to activate the whole of it, it can be argued that *I waved down a taxi* triggers off an interpretation process based on metonymy (i.e. part of a scenario stands for the whole scenario). Panther and Thornburg (1998) have applied this proposal to illocutionary meaning. They contend that underlying speech act categories there are illocutionary scenarios. In the "request" scenario, for example, the ability and willingness pre-conditions are the "before" component, the injunction or obligation to act is the "core", and the outcome is the "after". *You could do it now*, which only activates the ability precondition, may thus mean 'please, do it now' through metonymic access to the whole request scenario. Panther (2005) further argues that metonymy is an inferential schema whose activity ranges from lexical (e.g. *brain* for 'intelligence') and predicational structure (e.g. *I'll be brief* stands for 'I'll speak briefly') to pragmatic inference (e.g. the "taking a taxi" and "request" examples above). Ruiz de Mendoza and Galera (2014) have observed that there are two kinds of metonymic activation at work in pragmatic inferencing: domain

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expansion and domain reduction, which will be further discussed below (Section 2.2.2). It is true that the 'taking a taxi' scenario can be called upon by mentioning part of it. This requires domain expansion. However, since the pragmatic interpretation of *I waved down a taxi* is not the whole scenario, but only part of it, i.e. reaching the destination by taxi, domain reduction is also necessary.

There are two broad types of inferential cognitive operations (Ruiz de Mendoza, 2017a): *formal* and *content*. In language use, the former operations are used to manipulate concepts structurally, while the latter are responsible for the production of meaning inferences. Thus, formal operations play no direct role in figurative meaning, which arises from the activity of content operations. However, formal operations do play a role in preparing conceptual structure –through selected activation, integration, and substitution– for content operations to act on it and produce the intended figurative meaning. Because of their supportive role, these operations are only incidental to our proposals on the relatedness between different figures of speech and the constraints on their production. So, our focus will be on content operations, which are of greater importance for the purposes of this paper.

2.2.1 *Formal operations*

Typically, formal operations cooperate with content operations by preparing conceptual structure for inferential activity. In previous work (Ruiz de Mendoza and Galera, 2014; Ruiz de Mendoza, 2017a), the following formal operations have been distinguished:

a. *Cueing* and *selection*. Speakers use prompts for hearers to determine the conceptual material that is to be selected for interpretation. For example, the verbal predicates *wear* and *eat* act as cues for the interpretation of the word *rabbit* as 'rabbit's fur' or 'rabbit's meat', as in *She likes to wear rabbit* vs. *She likes to eat rabbit*. Each of these predicates is conceptually consistent with only one interpretation of the word *rabbit*. Note, in this connection, that the search for consistency is normally counteracted by the natural tendency of human cognition to production and processing economy, as has been noted by relevance theorists within inferential pragmatics (Sperber and Wilson, 1995). This means that speakers tend to be selective: not all possible meaning associations but only those that are deemed to be relevant can be cued for activation. Such selected activation can correspond to the mental process underlying what Langacker (1999, 2009) has termed *active zones*, which he defines as the relevant meaning facet of a profiled (i.e. designated) concept. Compare the two different active zones of the concept 'cigarette' in these two sentences: *There are cigarettes on the pavement* (the stubs) and *Put out your*

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cigarette (the burning end). On the pavement we expect to find the cigarette stubs rather than the whole cigarette and putting out a cigarette involves its burning end. These conceptual contexts act as cues for the selection of the relevant meaning facets of the notion 'cigarette'.

b. *Abstraction*. This operation consists in the derivation of generic-level conceptual structure from lower-level structure. This can happen in two ways. One of them relates to the gradual process of creation of generic concepts. For example, from such notions as *kill, hit, break*, we can derive the generic-level notions of action, agent, object, instrument, and result, as common elements. The second way underlies short-term abstractions. A case in point is provided by our ability to set up correspondences across conceptual domains in metaphor, which, as noted by blending theorists (cf. Fauconnier and Turner, 2002), requires finding generic-level structure in common. For example, in *Your teeth are pearls* we first abstract away structure that is common to both teeth and pearls in terms of overall physical shape, color, and brightness, and then we get the structure to correspond. The coincidence of generic-level structure is necessary for metaphor to be felicitous; in other words, it is a constraint on cross-domain mappings, an issue that we will discuss in more detail later.

c. *Substitution*. This operation consists in replacing a given conceptual configuration by related conceptual structure. The substitute configuration can be more schematic than the one to be replaced, as in the case of anaphoric pronouns capturing only gender and number (*I saw your girlfriend yesterday; she is gorgeous*). In other cases, what we have is non-schematic representations involving the substitution of the intended referent for the expressed one. This is the case of referential uses of metaphor (*There is the rat you're looking for!*, where 'rat' is to be replaced by 'despicable traitor') or of metonymies involving referential shifts (*Do not untie your shoes*, where 'shoes' substitutes for 'shoe laces'). Finally, an expressed non-schematic cluster of properties can be used to denote a related cluster, as in some examples of euphemism (*ample* for 'fat') and oxymoron (*living dead*, where *living* substitutes for 'having the ability to move').

d. *Integration*. This operation, which relates to Fauconnier and Turner's (2002) notion of blending, consists in the principled merging of conceptual structure from any number of cued items. Integration can stay at the descriptive level as in the compound *corkscrew*, which is a screw-like object used to pull corks from bottles. This compound inserts the notion of 'cork' within the bottle-opening scenario, which includes using the corkscrew to open a bottle (typically containing wine or champagne), pouring the contents into a cup, drinking them, etc. But integration can also work at the figurative level in very significant ways. For example, think of a personified tree with eyes, ears,

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a nose, a mouth, arms, hands, and fingers, as often depicted in cartoons for children. This combination is evidently metaphorical: we ascribe human attributes to a plant. However, here, the metaphorical output requires more than this ascription. It requires the integration of selected conceptual structure from people into specific features of trees (the cracks and holes in the trunk, the branches and twigs, etc.). This form of integration can also be expressed linguistically: *The tree grabbed me with its long limbs and hid me up in the leaves at the top.*[2] One frequent way of combining conceptual structure, which was first identified by Peña (2003, 2008), happens when an image schema, as defined by Johnson (1987), is integrated into part of the structure of another image schema. Image schemas are topological conceptual characterizations that people develop from the earliest stages of their development. Among them, we have such notions as path, motion along a path, part-whole configurations, and three-dimensional space (the so-called container schema). An example of image-schematic integration is provided by the English preposition *into* which requires building a container image schema into the end-of-path slot of the path image schema (e.g. *The child flicked the marble into the hole*). This preposition can be used metaphorically, as in expressions like *go into trouble, get into a good mood*, and *come into being*, where we see a change of state as if it were a change of location, i.e. a bounded region in space which is seen in terms of container logic. States may carry an axiological load; e.g. trouble is negative, while a good mood is positive.

2.2.2 *Content operations*

The discussion above, which includes finding similarities between concepts, has led us into the domain of content cognitive operations. Following Ruiz de Mendoza (2011, 2017a), we distinguish the following:

a. *Resemblance (or similarity) finding and contrasting.* Through resemblance-finding operations we look for similarities between concepts or parts of concepts. Metaphors involving cross-domain similarities and simile are based on such cognitive activity. As was noted above, finding similarities requires the supporting activity of at least two formal cognitive operations: cueing and selection. If the metaphor is used referentially, there may be substitution too, which takes place after the metaphor has been constructed on the grounds of cueing and selection. For example, we can say that a woman is a rose, thus

2. http://americanlitandme.blogspot.com.es/ (accessed September 5, 2017).

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highlighting her beauty and attractiveness. Once portrayed in this way, we can refer to her as *my rose*, where the name of the flower is used to refer to the lady. Resemblance can also act as a formal operation, necessary for the integration of conceptual structure. In the tree with human features, the resemblance between certain aspects of the tree is essential for the integration of human eyes, ears, nose, arms, and fingers into the conceptual structure of the tree. In this situation, resemblance is not itself a source of inferences, but it may contribute to further metaphorical activity. On the other hand, contrasting is the converse of resemblance. In any contrast, there are at least two states of affairs (states, events, situations) or two entities such that one is the opposite of all or some aspects of the other. The importance of contrastive relations in language is evidenced by the existence of discourse markers and conjuncts signaling them (Ruiz de Mendoza and Gómez, 2014) together with language user's awareness of antonymy (*black*/*white*) and other non-antonymic paradigmatic and taxonomic contrasts (*robin*/*sparrow*). In the domain of figurative language, contrast relations are found in irony, paradox, and oxymoron. In the case of irony, the ironist typically confronts the hearer with a description that clashes with observable reality (e.g. *Yeah, right, a gentle drizzle!*, referring to a violent rain storm). With paradox, there is a discrepancy between two predications, which can only be resolved by reframing the state of affairs described. For example, the conceptual clash in *You can save money by spending it* is not such if we think of a situation in which making a small upfront investment may allow someone to cut down on costs later. As for oxymoron, there is also an apparent discrepancy that takes place at the level of objects or their attributes. For example, an *open secret* refers to information that was originally intended to be confidential but has at some point been disclosed and is known to many people.

b. *Correlation*. Grady (1999) and Lakoff and Johnson (1999) have noted that much metaphorical thought arises from experiential correlation. When two events co-occur frequently in our experience, people may mix them up in their minds and treat them as if they were the same. This situation of mixing up concepts has been termed *conflation* (Johnson, 1999; Grady & Johnson, 2002). Thus, we say metaphorically that people are warm or cold when they are friendly or unfriendly probably because showing affection involves proximity and the physical perception of other people's bodily temperature. In principle, there is no similarity between the concepts involved in experiential correlation; e.g. affection does not look or feel like warmth. However, at a more abstract level, we can have similarity of effects. Thus, warmth can be a source of physical comfort in the same way as being with a loving person can be a source of emotional comfort (which could ultimately be physical too,

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especially in desired intimate contact). The same holds for other correlations. For example, the intentional component of the primary scene in which people reach destinations where they want to go (i.e. which is their goal to reach) provides a rationale for expressions like *reach one's goals, make it to the top, get where one wants*, etc. Again, there is no direct resemblance between goals and destinations. But if we think of both notions in terms of the broader conceptual schemas to which each belongs, we do have similarity. Thus, reaching a destination is the result of traveling in the right direction, with the right vehicle, and overcoming impediments to motion; in turn, reaching a goal is the result of acting in the correct way, with the right means, and overcoming any obstacles to progress. There is an underling high-level action-result schema according to which taking the necessary steps leads to the desired result while not taking them leads to failure. Take now, the well-known quantity-height correlation based on our experience of seeing levels rise as greater quantities of objects or a larger amount of a substance accumulates. This correlation underlies metaphorical expressions like *Salaries go up/down, Prices soar/skyrocket, Stocks have plummeted*, etc. While there is no low-level similarity between rising or falling levels and greater or smaller amounts or quantities, the high-level structure of their underlying schemas does involve similarity at the level of effects or results. When an object goes up the final expected outcome is that it will end up in a "high" position in space, which is also the position resulting from piling up objects or filling up containers. It may further be noted that cause-effect and action-result relations may also conflate in our minds. This is only natural since actions cause effects that correlate with the end-point stage of the action and its accompanying outcome. Imagine a broken glass. In terms of action-result, we think of the broken glass as the result of someone doing something that has broken it. In terms of cause-effect, we know that someone caused the glass to break (effect).

c. *Domain expansion and domain reduction*. These are opposing operations, whose activity underlies metonymic thinking at various levels of abstraction and in several descriptive domains (lexical, predicational, implicational, illocutionary; Panther, 2005; Ruiz de Mendoza & Galera, 2014). The former operation broadens while the latter narrows down the scope of a conceptual characterization. Both operations have profile shifting effects. Consider the notion of 'violin', which profiles the stringed musical instrument. In the sentence *The violin didn't play well*, the impossibility of a violin playing by itself cues for the broadening of the scope of this initial characterization to include the player of the instrument. This broadened configuration is a new profiled (or designated) concept. Different profile shifts through broadening may change with the context as well. In a workshop where workers are specialized

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in making different instruments, the person making violins could be called *the violin*. In turn, domain reduction has a different function. It gives focal prominence to part of a characterization, while the conceptualization to be broadened in domain expansion has focal status by default (e.g. 'violin' is focal whether it refers to the musician or the worker). Such focal shift results in the profile shift typical of this operation. For example, in *Don't untie your shoes again*, the target concept *shoelaces*, which requires a change in profile from *shoes*, is reached by reducing the scope of this source concept. One might erroneously think that expansion and reduction could qualify as formal operations since they are based on the formal manipulation of concepts. This is not the case, however, for two reasons. One is that there is no structural change since the source concept is not altered. The other is that this unaltered source remains active all through the expansion/reduction process thus becoming a source of meaning effects that bear upon interpretation. Take expansion first. Saying *The violin didn't play well* versus *The violin player didn't play well* highlights the relevance of the violin (the source) in terms of the result of the musical performance. This meaning effect is absent in the more neutral non-metonymic expression. Similarly, reduction is another source of meaning effects. Think of metonymies like company-for-worker (e.g. *Toyota has laid off dozens of workers*) and ruler-for-army (e.g. *Sadam Hussein invaded Kuwait*). These metonymies ascribe to the company and the ruler the responsibility for what the workers and the army have done. This meaning effect is not conveyed by the literal expressions: *Toyota officials have laid off dozens of workers*; *Sadam Hussein's army invaded Iraq*.

d. *Parameterization*. One form of domain reduction is involved in parameterization, which consists in the pragmatic adjustment of a generic concept or conceptual representation. In Ruiz de Mendoza and Galera (2014) parameterization is treated as a low-level or content operation, which is essentially correct. For example, *They did her hair* makes use of generic *do* to mean any number of specific actions associated with the work of a hairdresser (e.g. backcombing, dyeing, blow-drying, etc.). But a finer-grained analysis would acknowledge two facts: one is that *do* substitutes for these actions and the other is that any of these actions is a subdomain of the generic one, that is, parameterization involves domain reduction for generic-level *do*. This allows us to define parameterization as the process of narrowing down the scope of a generic-level conceptual item to a lower-level item where the latter is in a type-of relation with the former and where the former substitutes for the latter.

e. *Saturation*. The notion of saturation or completion is well-known in the inferential pragmatics literature (cf. Carston, 2002). Arguably, as noted above

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for expansion/reduction operations, saturation could be a formal operation since it consists in completing an underspecified conceptual representation with other conceptually compatible material. However, saturation shares with content operations its inferential nature, which is broadly acknowledged by relevance theorists who consider saturation as one of the pragmatic tasks that play a role in the derivation of *explicatures*, i.e. implicit meaning that arises from the direct development of the blueprint provided by the linguistic expression rather than from the premise-conclusion reasoning schemas associated with implicatures (Sperber and Wilson, 1995). Typical cases of saturation take place in the case of constructional under-determination (e.g. *He is not good enough > He is not good enough for this job*) and sub-sentential utterances (e.g. *[I wish you will have a] nice day!*). When faced with such expressions, hearers are required to retrieve the relevant information from their world knowledge or from the context of situation.

f. *Strengthening* and *mitigation*. These are converse cognitive operations whose function is to place scalar concepts–whether physical (e.g. 'distance', 'size', 'temperature'), emotional (e.g. 'anger', 'love'), or social (e.g. 'respect')–as close to either end of the scales they belong to as is contextually relevant. In other words, strengthening "scales up" and mitigation "scales down" concepts within their scale of reference. Ruiz de Mendoza and Galera (2014) have discussed the activity of these two operations in grammar, pragmatics, and discourse. Our concern here is with overstatement and understatement. On the speaker's end, overstatement is constructed by upscaling a concept beyond its expected proportion. Exaggerations like *You weigh a ton* or *I've told you thousands of times not to do that* (Peña and Ruiz de Mendoza, 2017) are clear applications of this operation. Understatement, on the other hand, results from downscaling a concept to an unrealistic extent. For example, mitigation in the sentence *It's just a small contribution*, said by millionaire that has donated an exorbitant amount of money to a charity, has the function of downplaying the importance of the donation (for whatever personal or social reasons).

g. *Echoing*. The notion of echo comes from Relevance Theory in inferential pragmatics (Wilson and Sperber, 2012). An echo is the repetition of what someone has said or thought, which, as noted in Ruiz de Mendoza (2017b), includes social stereotypes. Relevance theorists have noted that irony consists of an echoed utterance or thought that conveys an attitude of skepticism or wryness. For example, imagine that the speaker has heard one of his friends emphatically contend that a common acquaintance of theirs is a gifted guitarist. The speaker has reservations but waits patiently until one day, both the speaker and his friend attend a rather poor performance by this guitarist. The speaker

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remarks: *Yes, a gifted guitarist indeed*. This remark echoes the previous claim tinging it with ironic overtones. Of course, echoes are not restricted to irony. We can think of reported speech, for example. But when an echoed thought clashes with observable reality, it becomes an indicator of the speaker's attitude to it. If this attitude is one of voluntary dissociation from the echoed thought, irony takes place.

2.3 Benefits of the account

This brief account of cognitive operations has provided some initial insights into their importance to understand figurative language, which should not be underrated. These are some of the advantages of such an account:

a. It makes it possible for analysts to determine with more precision the nature and communicative behavior of any given figure of speech. For example, ironic effects may result from the interplay between two content cognitive operations: echoing and contrast. An echoed thought ostensibly clashes with observable reality thus signaling the speaker's dissociation from such a thought and the probable speaker's desire for the hearer to adopt the same attitude to the echoed thought. We will elaborate on this point further in Section 3.5.
b. It facilitates the detection of similarities and differences among different figures of speech such as the existence of a contrasting operation in irony, paradox and oxymoron, which in each case calls for a solution to the clash. Irony requires hearers to cancel out their initial assumptions on a state of affairs. Paradox and oxymoron demand the activation of a non-default scenario that can reconcile the apparent discrepancies between the default interpretations of two clashing linguistic items.
c. It facilitates the description of how figures of speech can combine and why. For example, think of the expression *Prices are skyrocketing* in contrast to *Prices are rising rapidly*. These two expressions are based on the more-is-up (i.e. quantity-height) experiential correlation mentioned in the previous section. The difference between them is that the first one is more impactful than the second one. With its existing analytical tools, the standard Conceptual Metaphor Theory approach (Lakoff and Johnson, 1980, 1999) would trace this meaning difference to the way the source-domain structure and logic are put in relation with corresponding target-domain structure and logic. A skyrocket ascends high into the air very quickly. This scenario maps onto a sudden quick and large increase in prices. However, it is unlikely that the speaker is trying to convey the idea that prices have increased at the same rate and

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extent as a skyrocket ascends. What is conveyed is that the increase of prices, besides sudden, quick and large, is as surprising and psychologically impacting. Source-domain logic supports these subjective meaning implications only indirectly. We need to postulate hyperbole, which is based on "scaling up" the motion and distance variables of the source domain. This additional cognitive operation is compensated by the derivation of extra meaning effects of a non-denotational, subjective kind.

3. Figures of speech revisited

The account of cognitive operations sketched out in the previous section has provisionally allowed us to identify and discuss some basic figures of speech. A basic figure of speech is one whose central meaning arises from the activity of content cognitive operations. Other figures of speech traditionally recognized in rhetoric and literary theory are variants of basic figures and may be accounted for in relation to them. These are the correlations between content cognitive operations, which are our focus in this paper (see Section 2.2), and basic figures of speech:

a. Correlation metaphor: central to it are correlation cognitive operations.
b. Resemblance metaphor: based on similarity finding operations.
c. Simile: like resemblance metaphor, based on similarity finding operations.
d. Metonymy: built through domain expansion or reduction operations.
e. Overstatement and understatement: on the speaker's end, based on strengthening and mitigation operations.
f. Paradox and oxymoron: based on contrasting operations.
g. Irony: based on echoing and contrast.

Irony is arguably less basic than the other figures listed above to the extent that it involves a combination of more than one content cognitive operation. This observation is in keeping with the tradition of psycholinguistic experimentation that allots to this figure a meta-representationally more complex status than to metaphor (Gibbs & Colston, 2012, p. 185). However, we argue for the basic status of irony on the grounds of the existence of other figures of speech directly stemming from it, such as auxesis (an extreme form of hyperbole), meioisis (an extreme form of understatement), and litotes (another extreme form of understatement achieved through negation), which are discussed below. These are non-basic or derived figures. In the following subsections, we explain how basic and derived figures of speech relate in terms of their cognitive composition.

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3.1 Metaphor, simile, and related figures

Here we focus our attention on resemblance metaphor and simile. Attribute-based resemblance has been an object of study in traditional accounts of metaphor and simile. For example, white, shiny teeth resemble pearls, deep black eyes resemble jet beads, a hooked nose resembles the beak of a bird of prey, and so on. However, there other forms of similarity that have received much less attention. A case in point arises from correlation metaphor, which, as noted above (Section 2.2.2), requires similarity judgments at a higher level of abstraction than resemblance metaphor. This assertion is illustrated by a consideration of the origin of the correlation metaphor 'immorality-is-filth' (e.g. *He has a dirty mind*), which is grounded in our experience of feeling nauseated at the smell and appearance of filthy things in the same way as we feel disgusted by immoral behavior. Although immorality and filth share no attributes, they can be related through the similarity in the effects they produce on those experiencing them. This similarity in the effects is what leads people to treating their respective causes as if they were similar.

While higher-level similarity based on cause-effect schemas is naturally less likely to develop into other figures of speech, it can act as a licensing factor in the creation of *metaphorical amalgams* (Ruiz de Mendoza & Pérez, 2011; Ruiz de Mendoza & Galera, 2014; Miró, 2018). Thus, the 'effect-for-cause' metonymic relation licenses the integration of the metaphor IMMORALITY IS FILTH into PEOPLE ARE ANIMALS. Imagine a female employee that feels harassed by her boss. She remarks with disgust: *My boss is a pig*. Pigs are perceived as "dirty" and "unclean", but there is not necessarily anything physically dirty in the boss (he may even be extremely clean). This metaphorical expression makes sense only if we think of the mapping from pigs to the speaker's boss in connection to immorality-is-filth. Once again, the 'effect-for-cause' metonymy allows us to equate unrelated causes (physical filthiness and immorality) through the similarity of their effects (the comparable feelings of disgust), thus making it possible to build the correlation metaphor into the resemblance metaphor.

Other cases of the 'people-are-animals' metaphor, however, do not involve amalgams: a fox is an astute person (since we think of foxes being so); a person is said to have eagle's eyes to emphasize good eyesight (since we think of eagles being able to spot their prey from large distances); a bull is a large and aggressive man (since we think of bulls as being so); and so on. These other examples require finding direct similarities, which is the same procedure that we use to build similes. The difference between similes and metaphors is to be found in the way to signal their range of possible interpretations. Similes can range from highly open-ended to very specific. Compare *She has ocean-like eyes* and *Her eyes are as blue as the ocean*. Ocean-like eyes are not only blue in color. They are also deep, crystalline, watery,

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etc. All these features are possible for *like* similes. By contrast, the construction *A is as X as B* restricts the range of possibilities to the option explicitly provided by the linguistic realization of the simile. Metaphor is in principle open-ended, so much so that a sentence like *Her eyes are an ocean* may require specification by means of saturation through a complementation pattern, as in *Her eyes are an ocean of tears*. However, metaphor is highly sensitive to conventionalization. When this happens, its interpretation can be highly restricted. This is the case of the metaphor *a business shark*. Figuratively, a shark is a person that mercilessly takes advantage of others for personal gain. Just like a real shark can smell blood and then attack, a business shark can detect the weaknesses of other businesspeople and cause them harm. It is difficult to find a different interpretation. In the case of the notion of shark, a *like* simile, however, invites for an exploration of features (cf. Glucksberg 2001, 2006): *He is like a shark* could mean that he swims fast, or that he is aggressive, or strong, scary, or dangerous. All these attributes can be made explicit through the *A is as X as B* construction: *He is as fast/strong/scary/dangerous* as a shark.

There are other figures of speech that are built on the basis of resemblance operations: allegory, analogy, paragon, synesthesia, and hypocatastasis are well-known in the literature. Let us discuss each of them briefly.

3.1.1 *Allegory*

Allegory is traditionally understood as a narrative metaphor that uses a character, place or event to reason about (and represent) real world issues and occurrences. Plato's famous allegory of the cave provides good illustration. In it, we have the situation specified in (a) and the related events (b)-(d):

a. A group of people are chained in a cave facing a blank wall.
b. These people see shadows that are projected onto the wall by objects in front of a fire behind them.
c. One of these people one day manages to get out and see the actual objects.
d. Those in the cave do not believe him when he reports back to them.

The person that gets out of the cave stands for a philosopher that finds greater knowledge and understanding, seeks to share his knowledge, but is ironically resisted by those that are less educated.

From a production perspective, allegories, like referential metaphors, make use of substitution, but rather than using a source element to stand for an individual element in the target, after the cross-domain mapping takes place, each source element represents a class; e.g. the chained prisoner that escapes (source) maps onto a philosopher, which in turn substitutes for any philosopher (i.e. any member of the class of philosophers) that finds out the truth (target).

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3.1.2 *Analogy*

Analogy is best defined as structural resemblance where the relation of the parts to parts and to their respective wholes is preserved in the source and target domains. The reasoning process in analogy takes this form: A is to B as C is to D, so A = D, where A, B are elements within a knowledge frame and C and D are elements belonging to another frame. In terms of meaning construction, this kind of reasoning can be exploited to create analogy-based metaphors. For example, in *His nose is an elephant's trunk*, the person's nose (A) is to the person's face (B) as an elephant's trunk (C) is to an elephant's face (D); so a nose is "a trunk". Or consider: *The heart pumps blood throughout the body*. Here, the heart (A) is to the blood circulation system (B) as a pump (C) is to a hydraulic system (D); so the heart is "a pump".

Correlation metaphors such as 'affection-is-warmth' (e.g. *She's a warm person*) or 'more-is-up' (e.g. *Prices are going up*) are not analogical, since they are based on the co-occurrence of experiences; nor are resemblance metaphors, since they are based on mapping attributes (e.g. white and shiny for the mapping of pearls onto teeth) rather than on structural relations.

3.1.3 *Paragon*

A paragon is a person or object that is regarded as a perfect example of a given quality. From the perspective of meaning construction, it is created by combining metaphorical resemblance and metonymy. An example is provided by the sentence *Humboldt is the Shakespeare of travelers*. This example, which has been borrowed from Brdar (2007, p. 111), is discussed in Ruiz de Mendoza and Galera (2014, p. 114) as a case of interaction between metaphor and metonymy. In this sentence, Shakespeare stands for his own qualities as a superb writer. This is evidently a case of metonymic domain reduction of the source domain of the metaphor (cf. Ruiz de Mendoza, 2014), which is thus prepared to convey the intended meaning effects by way of a cross-domain mapping. Thus, Shakespeare as an ideal writer maps onto Humboldt as an ideal traveler in terms of comparable ingenuity and skills in traveling. Note that rather than just map writing onto traveling, we map superior skills in the former field of human activity onto superior skills in the latter field (Figure 1).

Not all cases of metonymic reduction of a metaphoric source qualify as paragons. For example, the word *nose* in the expression *have a nose for something* is metonymic for the sense of smelling characteristically associated with the nose. The sense of smelling is a subdomain of the notion of nose, which makes this example a case of domain reduction. It is this metonymic meaning that takes part in the correlation metaphor between the sense of smell and a person's intuition. This correlation is grounded in such experiences as a person recognizing (and thus averting the danger of) a gas leak by smell, or police dogs finding hiding criminals

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by tracing their scent. However, this form of metaphor-metonymy interaction is the only natural option for paragon. The reason for this is that for people or objects to be used as ideal examples, it is necessary to bring out the attributes that make them such. This is precisely the function of metonymic domain reduction.

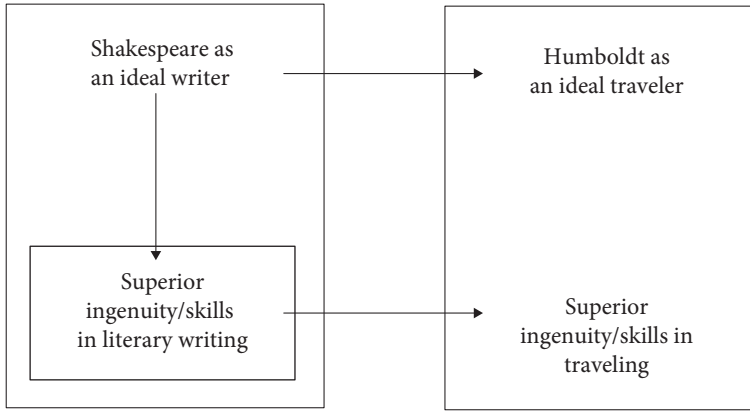


Figure 1. Humboldt is the Shakespeare of travelers

3.1.4 *Synesthesia*

Traditionally, synesthesia is described as a rhetorical figure in which one sense is described in terms of another. In Dante's *Divine Comedy*, in the first canto, the poet tells us about the "inferno" as the region where the sun is silent, which binds the sense of sight (the sun) with the sense of hearing (silence). In terms of figurative language production, the question is why can speakers bind these two senses in describing the inferno? This is possible because of the similarity of effects between the sun and silence in terms of their lack of intensity. Similar effects allow for exchangeable causes through a substitution operation (i.e. 'silent' substitutes for 'dull'). Following the same rationale, in English we can talk about a sound and a color being "dull" (i.e. lacking in intensity). Since effects are shared, the causes in the domains of loudness and brightness become interchangeable. Obviously, these observations point in the direction of considering synesthesia as a specific type of correlation metaphor grounded in the conflation of causes arising from similarities in the effects of sensory perception.

3.1.5 *Hypocatastasis*

Hypocatastasis is generally described as an implied comparison; e.g. in the Bible, Satan is referred to as "the serpent". When Eve says: *The serpent beguiled me* (Genesis 3: 13), the comparison is implied. Evidently, only the source domain of the metaphor is mentioned explicitly, the target being implicit. This is very common in

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referential uses of metaphor where the source substitutes for the target, as noted above for *There is the rat!* ('the traitor'). Traditional rhetoric has ignored the fact that, in general, correlation metaphor does not make target domains explicit; so, correlation metaphor can be hypocatastatic too: *A cold lady* ('unaffectionate'), *a big project* ('important'), *the bumps along the road* ('the difficulties to progress'). Evidently, from a production perspective, hypocatastasis can be better explained as resulting from the combination of correlation/resemblance operations and substitution. Interestingly, in its use of substitution it converges with referential metonymy.

3.2 Metonymy and related figures

We have treated metonymy as the combination of a content operation of expansion or reduction with the formal operation of substitution. This understanding of metonymy is useful to relate other figures of speech to it. Synecdoche, hypallage, anthimeria, anthonomasia, merism, and aphorisms (proverbs, adages) are some such figures.

3.2.1 *Synecdoche*

Synecdoche is a subtype of metonymy involving either expansion or reduction, where the whole stands for the part or the part for the whole; e.g. *Can you drive/handle a stick?* ('a manual transmission car'); *He drank the whole bottle* ('all the contents'). Like metonymy, from the point of view of meaning construction based on cognitive operations, synecdoche is built by combining domain expansion/reduction with substitution. Since part-whole relations are just one form of domain-internal relations, among others, it is unnecessary to distinguish synecdoche from metonymy.

3.2.2 *Hypallage*

This is a very interesting figure. It is usually defined as a transferred epithet, as in the use of *sad* applied to *novel* in *That was a very sad novel*. In terms of meaning construction, the question is what allows such a transfer. Metonymic expansion can account for this. Novels cannot be literally sad, like people, but they arouse feelings of sadness in the prospective reader. There is some underlying cause that brings about a given effect. However, the speaker names the effect (in this case the feeling of sadness) to refer to the cause as a manifestation of the high-level metonymy 'effect-for-cause'.

3.2.3 *Anthimeria*

With this figure, one part of speech is used as another thereby resulting in the categorial conversion of the former. This phenomenon has already been investigated by cognitive linguists (cf. Kövecses and Radden, 1998; Ruiz de Mendoza

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and Pérez, 2001; Brdar, 2007). The highlighted words below are examples of two common types of conversion:

a. Noun to verb: *You should avoid* texting *your ex*; *You keep lyin' when you oughta be* truthin' (Nancy Sinatra). *Just* Google *the word and you'll know what it means*; *The Olympian* medaled *seven times*; *She* ovened *the cake for three hours; He* heads *a governmental unit*.
b. Verb to noun: *I'd need a good night's* sleep*; It's a deep* cut*; Give me a* bite.

In terms of meaning construction, anthimeria involves (high-level) expansion/reduction metonymic thinking based on a formal operation of abstraction, as evidenced by the paraphrases below:

> *Text* (vb.): use a text message to communicate (means-for-action) (expansion).
> *Truth* (vb.): tell the truth (result for action) (expansion).
> *Google* (vb.): use Google to search (means-for-action) (expansion).
> *Medal* (vb.) *at the Olympics*: win a medal (object-for-action) (expansion).
> *Oven* (vb.) *a cake*: use an oven to bake a cake (instrument-for-action) (expansion).
> *Head* (vb.): lead (head-for using the head to lead-for leading) (double expansion).
> *Sleep* (n.): the state resulting from sleeping (process-for-result) (reduction).
> *Cut* (n.): an incision resulting from cutting (action-for-result) (reduction).
> *Bite* (n.): an amount of food obtained from biting (action-for-object resulting from the action) (reduction).

3.2.4 *Anthonomasia*

This figure refers to:

a. The substitution of an epithet or title for a proper name, as in the case of calling Joan of Arc *the Maid of Orleans*. In this form, anthonomasia does not necessarily involve figurative thinking, since Joan of Arc was a maid (in the sense of being avowedly virgin) and she went into battle at Orléans to raise the siege; figurative thinking, however, may be involved if the epithet is itself non-descriptive; e.g. *The Lamb of God* for Jesus Christ, which contains a metaphor that enhances Jesus Christ's meekness.
b. The use of a proper name to express a general idea; e.g. a Scrooge for a miser, where Scrooge stands for (i.e. substitutes for) the class of people that act as misers (domain expansion). This second form of anthonomasia is of interest for figurative meaning production, since it relates to paragon. Note that the source domain of the metaphorical mapping involved in paragon is a case of anthonomasia. An example is provided by the sentence *Phil Conners is the Scrooge of Groundhog Day*. This expression maps Ebenezer Scrooge's spiteful dismissal of traditions in Charles Dickens's *A Christmas Carol* onto

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TV weatherman Phil Conners's own contempt of local festivities in a small borough of western Pennsylvania in the film *Groundhog Day*.

3.2.5 *Merism*

Merism is the result of the combination of two contrasting words, which are relevant (or otherwise conspicuous) parts of a broader domain, to refer to the whole domain: *He searched for high and low* ('in many different places'), *A sword and sandal movie* (i.e. a movie taking place in classical antiquity). Merism can be accounted for in terms of the cognitive operations of contrast, domain expansion, and substitution. The contrasting words work in combination to afford access, through domain expansion, to the broader domain for which they stand. Thus, the contrasting words substitute for that broader domain.

3.2.6 *Aphorisms*

Also called proverbs or adages, aphorisms are (often witty) terse statements that are intended to capture (i.e. are echoic of) a universal intellectual, moral (or behavioral) truth. In terms of the model of figurative language production laid out herein, these figures pose a very interesting analytical situation. They are based on the (domain-expansion) metonymy 'specific-for-generic', where the metonymic target ('generic') is echoic. For example, the statement *When in Rome do as the Romans do* is a piece of advice for anyone who is faced with an unfamiliar situation ('when in Rome') to follow the lead of those who are familiar with it ('do as the Romans do'). So being in Rome is metonymic for any such situation, and the Romans for anyone involved in it. Since 'specific' is a subdomain of 'generic', the underlying content operation is one of (metonymic) expansion.

Aphorisms may involve complex metonymic shifts. Consider the now classic statement *The pen is mightier than the sword*, which is generally taken to mean that writing is more effective than military power or violence. This meaning results from a metonymic chain involving expansion and reduction (Ruiz de Mendoza, 2017a, p. 310):

a. Pen < any writing instrument (expansion) < action of writing (expansion) > result of the action of writing (persuasion) (reduction).
b. Sword < any weapon (expansion) < action of fighting (expansion) > result of the action of fighting (forceful imposition) (reduction).

3.3 Overstatement

A typical case of overstatement is *hyperbole*, which is an exaggeration intended to make a point more impacting. We have related this figure to the content operation of strengthening on the production end. However, hyperbole does not only

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consist of producing a "scaled-up" representation of a state of affairs. This representation is but an unreal conceptual scenario that is put into correspondence with (i.e. mapped onto) a real-world one. Thus, in the same way as with metaphorical mappings, in hyperbole we use source-domain logic (the unreal scenario) to come to terms with target logic (the real-world scenario). This procedure is used by speakers to produce in the hearer a specific meaning impact of an emotional nature. We can create hyperbolic effects in several ways (see Peña and Ruiz de Mendoza, 2017). One possibility is to use what has been termed an *Extreme Case Formulation* (Norrick, 2004), that is, an absolute expression like *always* (e.g. *You are always crying!*) or *endless* (e.g. *He has an endless list of complaints*). We can also use metaphor to extol qualities (*She's an angel*; *My teacher is an ogre*) or any disproportionately scaled-up concept: *It's been ages since we last met*; *I'm dying to see her again*; *This bag weighs a ton*; *It's a gigantic statue*. Whichever the strategy, hyperbole constructs an imaginary scenario featuring a powerful emotional reaction that carries over to a target-domain scenario constructed on the grounds of real experience. For example, an endless list is one that bothers us while an angel is someone that we all like and a gigantic statue is one that raises awe and admiration because of its size.

From the remarks above, we may distinguish between two types of overstatement: Extreme Case Formulations and standard hyperbole. From a cognitive perspective, the difference between them is a matter of whether we are dealing with a relative or an absolute magnitude in terms of its scale of reference. Extreme Case Formulations are based on absolute expressions like *every, all, none, best, least, always, perfectly,* and *absolutely*. These expressions are useful when dealing with quantity, frequency or there is an implied comparison. The absolute expression can be used instead of a lower-level one for reasons of impact, but also when the speaker feels that the latter might not be taken as an exaggeration. For example, if the speaker is upset that the hearer cries too often, it is preferable to say *You are always crying* than *You cry most of the time*. Even if *most of the time* is not true it might be taken as a literal (and erroneous) speaker's belief and not have hyperbolic impact. In addition, finding a non-absolute expression to express the same meaning could be very difficult, on some occasions even impossible, and it could lack the same impact, as would be the case of *You cry more than a newborn* if compared to *You are always crying*. By contrast, standard hyperbole can take the place of an Extreme Case Formulation when there is not any way to construct one. These special hyperbolic formulations can exploit simile (e.g. *You're as thin as a toothpick, He's as old as the hills*), metaphor (e.g. *You are a devil; He's an old dinosaur*), or highly upscaled expressions such as *a ton* (e.g. *This bag weighs a ton*), *a thousand* (e.g. *I told you a thousand times not to do that*), and *a million* (e.g. *There are a million reasons why you should vote*).

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Hyperbole can contribute to a phenomenon called *auxesis* in rhetoric. Auxesis refers to a climactic increase in communicative force. A well-known example of auxesis is found in the Bible. In 1 Corinthians 13: 13 (KJV), the apostle Paul notes: "And now abideth faith, hope, charity, these three; but the greatest of these is charity". Climactic forms are intended to draw attention to the positive aspects concept within a background of related concepts. In Paul's verse, charity is touted as the best of virtues. It is not difficult to see that hyperbole, based on exaggeration, can lend itself to climactic arrangements thus giving rise to hyperbolic auxesis. Consider a well-known example of hyperbole, drawn from Shakespeare's *Macbeth* (Act II, Scene II):

> Neptune's ocean wash this blood
> Clean from my hand? No. This my hand will rather
> The multitudinous seas incarnadine,
> Making the green one red.

Macbeth is troubled by his conscience after killing the king. He regrets what he has done and believes that the king's blood in his sinful hands cannot be washed away even by the largest oceans. This initial depiction conjures up an already extremely exaggerated picture that is subsequently further distorted by Macbeth expressing his feeling that the blood in his hands will in fact make the seas red. This takes the form of a climactic arrangement whose meaning impact is based on making the force of the second imaginary scenario add to the first. Again, note that all the communicative force is focused on the intensity of the speaker's emotional reaction. This is first achieved by mapping the imagined feeling of Macbeth hopelessly trying to have the blood in his hands washed away by massive amounts of water onto the real situation where he finds himself unable to get rid of his feelings of guilt (note that the blood stands for his sinful act as a telltale sign of it). Then, on a second mapping, his hands make the water red leaving an indelible sign of his murderous act.

3.4 Understatement, meiosis, and litotes

The situation is the reverse in the case of understatement. The speaker presents the hearer with an imaginary mitigated or "scaled down" formulation of what is the case in the world. However, as with overstatement, understatement makes use of the source logic of such an imaginary scenario to convey an emotional reaction about the real-world scenario that acts as the target. Imagine the sentence *It's rained just a bit more than usual* after a rather unexpectedly heavy rain downfall. It may be felt as humorous and even ironic in those situations in which someone

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had uttered the thought that it would only rain a bit more than usual. But in a context in which the rain has been much heavier than anyone could expect, the main function of the understatement is to mitigate the emotional impact of the situation on the audience. This function makes this figure of speech inherently euphemistic. As was the case with overstatement, there is an extreme form of understatement, which is referred to as *meiosis* in rhetoric. Meiosis presents the hearer with an extremely understated formulation of a scalar feature of a state of affairs; for example, calling the Ocean a "pond" or referring to extreme violence as "the troubles". Meiosis is, like understatement, inherently euphemistic and it can participate in cumulative decreases, which are the reverse of the hyperbolic climactic increases typical of auxesis. Imagine these two cumulative remarks made by a wounded soldier who wants to minimize the seriousness of his injury: *It's not that bad; in fact, it's not much more than a scratch*.

Another form of extreme understatement is *litotes*, which is constructed by means of double negation (e.g. *It's not unreasonable* 'it is precisely very reasonable') or of simple negation in situations in which what is negated is axiologically negative (e.g. the adjective *bad* has a negative value, which can be denied in *not a bad student* 'a good student'). Like other cases of understatement, litotes involves mitigation. However, it is not real mitigation, but only pretended mitigation by denial, since negation is not used to rule out a state of affairs, but to assert it emphatically in contrast to whatever may seem to be the case from a different perspective.

3.5 Irony

The situation with irony has been discussed in detail from various theoretical perspectives, which are summarized in Ruiz de Mendoza (2017b) and Ruiz de Mendoza and Lozano (2019). Among them, two approaches figure prominently: one is based on the notion of echo (Wilson & Sperber 2012) and the other on the notion of pretense (Clark & Gerrig, 1984; Kumon-Nakamura, Glucksberg & Brown, 1995; Barnden, 2017; see Popa-Wyatt, 2014; for discussion of convergences and divergences, see Ruiz de Mendoza & Lozano, 2019).

Irony has been traditionally described in terms of "pretended ignorance". This description arises from the Greek notion of *eirōneía*, which, in its application to verbal irony has been interpreted as stating the opposite of what is meant for purposes of expressing attitude (often, skeptical) and evaluation (Abrams and Harpham, 2009). The problem with this definition is that there is not ironic meaning every time speakers say the opposite of what they mean. Imagine that a man has repeatedly warned a close friend of his not to get involved in a risky business venture. Aware that his warnings have gone unheeded, this man remarks with frustration mingled with skepticism: *OK. Go ahead, do it!* There is no irony, even

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though this man wants his friend to do the opposite of what he literally says, and the speaker shows his personal attitude clearly.

It could be argued that the reason why the remark above does not qualify as an example of irony is the absence of feigned ignorance, which occurs when the speaker pretends to ignore that the content of his utterance contradicts reality. However, this is not the case, since in his example, the speaker does pretend to ignore that it is a bad idea for the hearer to act in the way he plans. The question is that for irony to occur what is said needs to make mention of what someone said or at least of a recognizably attributed thought. Such mention will be more clearly ironic to the extent that it resembles the expressed or attributed thought. Exact resemblance can be termed an echo. So, suppose that the speaker in our previous example rather naively thought that by saying *OK. Go ahead, do it!* the hearer might react and rethink his plans, but that this does not happen. Then, the speaker utters the same remark for a second time, thus making it echoic. Clear cases of irony are thus based on echoing a previous utterance or thought that evidently clashes with what is observably the case. It is precisely this clash that signals the speaker's attitude of dissociation from the echoed thought.

Basically, this happens through the application of a premise-conclusion reasoning schema, which is typical of pragmatic inferences. The premise, which is taken from our cultural and social conventions, is that no one asks other people to do something that he or she does not want them to do. An instruction by the speaker asking them to act in a way that the speaker does not desire leads to the conclusion that the speaker is not making a request but simply drawing attention to his or her feelings about the action in question. If the speaker's desires and feelings are ignored, then, the repetition of the same request cannot be interpreted in the same way again, but rather as the speaker's reassertion on the clash between what is said (the echoic expression capturing what the speaker thinks is wrong) and what is meant (the unheeded warning), thereby drawing the hearer's attention to the speaker's new feelings, which can only be of personal dissociation from the echoed expression. Personal dissociation can take the form of skepticism, indifference, apathy, wryness, etc., depending on speaker's individual and contextual factors.

There are other rhetorical figures that we can relate to irony. In the following subsections, we treat antiphrasis, prolepsis, and sarcasm.

3.5.1 *Antiphrasis*

Antiphrasis ('the opposite word') is a form of irony based on the use of an utterance that means the opposite of what is ostensibly intended. In Shakespeare's Julius Caesar, Cassius, despite knowing the emperor's flaws, refers to him as "this god":

> I did mark
> How he did shake. …tis true this god did shake…His coward lips did from their color fly…

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Like irony, antiphrasis is constructed through an echoic use of language that expresses the opposite of what is noticeably the case, thereby giving rise to attitudinal overtones. However, in antiphrasis speakers intensify the potential meaning effect of the clash they create between what they say and what is the case in a more conspicuous way than with general irony. This makes antiphrasis more pungent and consequently more likely to be used for comic effect. Imagine a police officer who gets vomited all over while trying to help a drunken man and exclaims: *Thank you, sir. You made my day*. The meaning impact of this utterance, which can be comic, has been calculated by the speaker more on the grounds of the clash between what is said and the real situation than on echoing. However, the police officer's words do echo what the officer would have had in mind or would have said in a more rewarding service situation.

3.5.2 *Prolepsis*

Prolepsis is traditionally described as an argumentation technique in which the speaker raises an objection to his own argument but then he immediately answers it (to strengthen the argument by responding to potential counterarguments). In the following example, the speaker wants to argue in favor of political integration but notes that people need to make some changes for such integration to be possible:

> It is difficult to see how more political integration will occur without a massive change in the way that most people view themselves

To communicate the idea expressed above, the speaker's uses a strategy based on pretending to be arguing (by saying *it is difficult to see*) against the workability of improving political integration, since there are no clear prospects of people making the necessary changes for the improvement to be possible. The apparent objection contains an embedded echo of an attributed thought (i.e. some people's belief that more political integration will occur), which the speaker pretends to believe is not generally valid. Interestingly, the fact that what the speaker literally says (the expression of a strong reservation) clashes with the echoed thought can indirectly portray the speaker as distancing himself from what is thought. Prolepsis thus contains the three essential ingredients of irony: an echo, a clash between the echo and reality, and the speaker's attitude. However, interpreting an example of prolepsis as involving irony will crucially depend on the degree to which the attitudinal ingredient is manifest to the audience.

3.5.3 *Sarcasm*

Sarcasm is a form or irony whose attitudinal component rather than being one of mere dissociation from an echoed thought has a strong degree of speaker's negative bias (interpreted as mockery or contempt) against the addressee's misinterpretation

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of a state of affairs. Think of a context in which the hearer is taken to think, or has explicitly expressed, his belief that he can play well despite a terrible performance. If the hearer is completely unaware of how badly he played, a sentence like *You play this game well!*, which echoes the hearer's belief, will only be felt as ironic if the speaker provides intonational and gestural support clues suggesting skepticism. If the speaker believes that he generally plays well but has reservations about his latest performance, the same sentence may acquire ironic overtones even in the absence of clear intonational and gestural support. Now, consider this other sentence in the same context: *You couldn't play this game well if you had a personal assistant!* In this case, the speaker has chosen not to provide an explicit echo of the hearer's erroneous thought, but to leave the echo implicit, as is revealed by the following extension of the previous sentence: *Yeah, right, you play this game well. You couldn't play this game well if you had a personal assistant!* In this example the double adverbial negation plays the same role to convey irony as the intonational and gestural support mentioned above. What this extension does is make fully explicit the contrast between the hearer's echoed belief and the speaker's belief thereby clearly revealing the existence of an ironic attitude, one of dissociation, which is interpreted as one of mockery or contempt on the basis of the protasis of the conditional sentence (*if you had a personal assistant*). The protasis is used to set up a hyperbolic scenario (using a personal assistant to learn to play a game) that is intended to discard any reformulation of the situation in question (e.g. learning to play well with further practice) that could alleviate the speaker's negative bias.

3.6 Paradox and oxymoron

Contrast operations are important in the different types of irony. But we can have conceptual clashes where no previous thought is echoed. If a clash is not resolved we are faced with one speaker contradicting another, which is not figurative thinking, since there is no special inferencing involved. However, when hearers are intended to resolve a clash, paradox and oxymoron may arise.

Paradox and oxymoron involve essentially the same cognitive processes. The difference between them is that paradox is based on the internal clash between the default interpretation of two predications within the same utterance, whereas oxymoron is grounded in the application of two clashing properties to the same entity. In both cases the clash is resolved by reframing. The reframing process overrides (and provides structure that substitutes for) the default interpretation of the clashing items. An example of paradox is the expression *to be filled with emptiness*, where "emptiness" can be reframed from the (descriptive/literal) domain of containment related to the full/empty image schema to the (figurative) domain of purposelessness. The figurative interpretation substitutes for the literal

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one. In turn, an example of oxymoron is the expression *a sober drunkard*. In a default interpretation, a drunkard's behavior generally clashes with a sober person's behavior, but occasionally a drunkard can reason unexpectedly like a sober person. This expanded frame substitutes for the default one. Another interpretive possibility is to take the adjective *sober* in its sense of 'serious, solemn or staid in character or conduct'. This sense is but a metonymic extension of the core meaning of *sober* from 'not intoxicated' to 'one capable of controlling one's behavior' (which is a relevant characteristic of sober people). Since a drunkard is not generally capable of self-constraint, saying that someone is a sober drunkard is still paradoxical and calls for reframing and substitution, as in the first interpretation discussed above.

4. Constraining figurative language

Much of the cognitive-linguistic work on figurative language has focused on the grounding of metaphor in sensorimotor experience, that is, on metaphor as rooted in how our bodies interact with the world (Lakoff and Johnson, 1980, 1999) thereby becoming an essential aspect of embodied thought, as noted in the introduction section to this paper. However, sensorimotor experience also underlies non-metaphorical figurative thinking. We have provided linguistic evidence that other figurative uses of language are "embodied" in much the same way as correlation metaphor. Our account in terms of cognitive operations has highlighted this aspect of figurative language. Cognitive operations are rooted in the brain's ability to re-construe experience, which is never independent of bodily parameters such as spatial relations, motion, and the perceptual (i.e. visual, auditory, tactile, etc.) exploration of the world around us. The experientialist hypothesis gave special prominence to the role of image schemas in metaphorical thought (Lakoff, 1987, 1990, 1993) and argued that metaphor is constrained by image-schematic thinking. This idea was captured by what Lakoff (1993, p. 215) termed the *Invariance Principle* (IP), according to which metaphorical mappings preserve the cognitive topology (or image-schematic structure) of the source domain without doing violence to the inherent image-schematic structure of the target domain. Thus, for a container schema a source-domain interior maps onto a target-domain interior and an exterior onto an exterior, but we cannot map an interior onto an exterior or the other way around. The same holds for other topological properties of objects. For example, the sentence *Brian's belly is a barrel of beer* suggests that Brian drinks too much by mapping some properties of barrels like their capacity to hold large amounts of alcoholic beverages and their rounded bulging shape onto the person's belly. Obviously, the relevant topological properties of barrels and bellies are

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preserved intact. The interior of the barrel is mapped onto the interior of the person's belly and the exterior (here relevant in terms of its shape) onto the exterior. In *Her eyes were a well of tears*, a person's eyes are treated as a well (a place where water issues from the earth) on the basis of the wrong assumption that tears are in the interior of the eyes. The water flowing out of the interior of the well maps onto the tears appearing to flow out of the eyes. Similarly, in the sentence Tears *welled in his eyes*, the use of the verb *well* ('to rise to the surface of a container and flow out of it') would not make sense if we focused on the exterior of the eye: **Tears welled on his corneas*. A question may arise as to the application of the IP to metaphors whose target domain has no topological structure. For example, we can think of emotions like love and anger as substances in a container, as in *He's full of love/anger*. The grounds for this kind of metaphor is our treatment of a person's body as a container based on the fact that the body contains hollow organs. What the metaphor does is treat emotions as substances that can fill the body (envisaged as a container), exert pressure on its interior walls, and flow out of it. The body is not, strictly speaking, a container but it has many properties that allow us to treat it as such. The body-container metaphor has the effect of leveling out the differences between a true container and the body thus drawing our attention to the (truly) hollow interior-(ascribed) hollow interior relations and the topological treatment of substances getting in, coming out, etc. As a consequence, there is a full preservation of the ascribed topological structure of the target in a way that is consistent with the topological structure of the source, as originally postulated by Lakoff.

The examples above point to the relevance of the IP as a constraint on metaphorical mappings. However, the IP is only one among several other principles that act as constraints. We devote the following subsections to a discussion of what are probably the most relevant constraints. It should also be noted that some such constraints are not exclusive of metaphor but hold for other figurative uses of language too. This is particularly true of any figure that can be accounted for in terms of mappings (e.g. metonymy, hyperbole).

4.1 The extended invariance principle

Ruiz de Mendoza (1998) noted that the IP is simply a subcase of a more general constraint on metaphoric thought that was formulated under the label of *Extended Invariance Principle* (EIP). According to the EIP, it is not only image-schematic structure but also all generic-level structure that is to be preserved across domains in a metaphoric mapping. By generic-level structure is meant any conceptual characterization that generalizes features in common among low-level characterizations for which we have specific sensorimotor programs (e.g. we know how to interact with a chair, but not with "things" in general; cf. Lakoff, 1990). The process

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for derivation of these conceptual configurations has been described above when discussing the formal cognitive operation of abstraction (Section 2.2.1).

An extended formulation of the IP that takes into account all kinds of generic-level structure has two advantages over the original proposal. First, it is sensitive to the fact that image schemas, despite their primary and possibly pre-conceptual nature (Johnson, 1987), are generic-level configurations, as evidenced by their ability to be enriched (that is, parameterized or specified) by lower-level conceptual characterizations. For example, compare the expressions *to be in a tight spot* and *to be in a quagmire*. Both suggest that there is a problematic situation affecting someone, but in the second, the situation is not only difficult (or awkward and difficult to escape from) but also frightening and perhaps even dangerous. These and other meaning implications are imported from our knowledge about the risks of falling into a quagmire. The notions of tight spot and quagmire enrich the highly schematic 'container' image schema differently. The way this enrichment takes place is guided by the meaning effects to be created in the target domain (in both examples a difficult situation). Second, this formulation offers a constraining factor for all kinds of metaphors, not only those grounded in image schemas. An example is provided by metaphors mapping animal behavior onto human behavior: a lion is an instinctually fierce and brave person, in much the same way as a lion is fierce and instinctual when fighting other animals or when chasing its prey; a chicken a coward, perhaps on analogy of chickens' tendency to squawk and flutter when scared; a shark is a person that takes advantages of the weaknesses or misfortunes of others for personal gain by similitude with a shark's quick and aggressive attack on more vulnerable creatures. Obviously, interpreting these metaphors first requires drawing generalizations on animal attributes based on specific forms of observable behavior. For example, a chicken's agitated squawking and fluttering is taken as a sign of cowardice, which is then used to reason about some forms of human cowardice involving comparable agitation. Cats are also envisaged as timid and easy to frighten. Their cowardice is based on their timid nature. It does not involve agitation but simply a quick, silent escape. This scenario is at the origin of the meaning implications of adjectives like *fraidy-cat* or *scaredy-cat*, often used playfully by children.

The EIP is a natural constraint for any figure of speech involving cross-domain correspondences. The case of simile is straightforward. Consider again *Her eyes are as blue as the ocean*. Here, color maps onto color. In the broader *like* simile *Her eyes are like the ocean*, we map other features: depth onto the perceptual impression of depth, transparency onto transparency, and so on. But the EIP should be further extended to make it apply to domain-internal mappings involving domain expansion or reduction, which is the case of metonymy. Think of object-material and material-object relations, as illustrated by the sentences *She wears mink* and

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She carries plastic respectively (see Kövecses and Radden, 1998). These generic-level relations are preserved in other uses. In the case of 'object-for-material', we can say: *She loves/hates mink; They won't buy/sell mink*; *He can't tell the difference between mink and rabbit*. However, we cannot refer to any other part of the animal to signify its fur (which we like, wear, buy, sell, etc.). For example, *She loves mink's legs* could mean that she likes wearing (or eating, collecting, etc.) mink's legs, but not the fur. As for 'material-for-object', plastic in She *carries plastic* refers to an object made of plastic, typically a credit card (plastic versus cash). It would make less sense or no sense at all to refer to the credit card by mentioning any other of its elements: **She carries a magnetic stripe/a 16-digit number/an expiration date*, etc.

The rest of the figures of speech that relate to metonymy also abide by the EIP. All of them involve a structural relation that is to be preserved. Thus, many forms of anthimeria make use of domain-subdomain relations involving the action frame. As we noted, the means, the instrument, or the object of an action can stand for the action. To preserve generic-level structural relations, there cannot be any shift in the role assigned to each frame element. Thus, *Google* is a means to search for words on the Internet (*He Googled his own name*), but not the result of such searches (i.e. the occurrences): **We have obtained three Googles*. The need to preserve role relations within a domain-internal mapping also holds for aphorisms, which make use of 'specific-generic' relations. For *pen* in *The pen is mightier than the sword* to mean 'persuasion by means of writing', this concept needs to be able to be envisaged as an instrument of writing and writing needs to have an identifiable result. Hypallage provides a more interesting case of application of the EIP. For *a sad novel* to mean 'a novel that has caused me to be sad', the novel needs to be the cause of its readers being sad (the effect). Since the novel and sadness fit their assigned roles, hypallage is possible. Other adjectives, like *pleasant, enjoyable*, and *hateful* can apply to *novel* but they do not give rise to hypallage since they cannot participate in the 'effect-cause' relation: a pleasant/enjoyable/hateful novel does not cause you to be pleasant, enjoyable, or hateful. In considering hypallage, one must be aware of the existence of asymmetries in the lexical coding of effect-cause relations. Hypallage is thus impossible for adjectives like *bored* or *amused* (**a bored/*amused novel*) since cause is directly coded for the concepts that they express in forms such as *boring/amusing* (*a boring/amusing novel*). Sometimes, however, we can have hypallage coexisting with an adjective coding cause. This is the case with *a sad*/*saddening event*, both of which obey the effect-cause structure, with *sad* envisaging the cause from the point of view of the effect, while *saddening* focuses directly on the ongoing cause, the effect playing a secondary role. In principle, there is no apparent reason why the pairs *bored/boring* and *amused*/*amusing* cannot be used in the same way, other than the fact that *boring* and *amusing* code both the effect and the ongoing cause.

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As cross-domain mappings, hyperbole and its variants (Extreme Case Formulations, auxesis) also follow the EIP. In hyperbole, we have an unreal source domain constructed by upscaling a scalar concept. The exaggeration ingredient of this imaginary scenario is a source of emotional reactions, which together with the rest of relevant source elements (i.e. those that contribute to the emotional reactions), maps onto corresponding elements in the target. Thus, in *I have told you a thousand times not to do that!*, the imaginary emotional (over-)reaction of repeating the same instruction a thousand times maps onto a corresponding reaction in the target, where the frequency is much lower, but anyway overly high from the speaker's perspective. The imaginary frequency maps onto the real frequency and the unreal emotional reaction onto the real one. The same analytical logic holds for understatement, whose function is to mitigate the impact of a state of affairs on the hearer. *It's just a scratch* maps the imaginary situation of someone having only minor wounds after a severe accident onto the real one where the wounds are more serious. The central element is, as with hyperbole, the speaker's emotional reaction.

We listed litotes under understatement before. However, litotes can also be regarded as a form of metonymy. Consider again *It's not unreasonable*. The paraphrase we offered, for the sake of our initial explanation, i.e. 'it is precisely reasonable', is not completely accurate. The distinction between reasonable and unreasonable is not one of all versus none. Cognitively, there are degrees of "reasonability" and "unreasonability", as attested by uses like *It's completely/highly/quite reasonable*, and like *It's absolutely/highly/rather unreasonable*. If we think of the concepts of reasonable and unreasonable as defining a positive to negative continuum (or scale), not being unreasonable can represent any degree of reasonability, not necessarily the positive end of the continuum. The range of options is even broader for *It's not completely/that unreasonable*, which can represent from any non-extreme degree of unreasonability to any degree of reasonability: *It's not completely unreasonable; in fact, it's quite/very/completely reasonable*. Contextual factors generally help hearers make the necessary pragmatic adjustments to hypothesize, with a degree of reliability, which parts of the continuum are more likely to be referred to by the speaker. From the point of view of the cognitive operations involved, having (any non-extreme negative) part of a meaning dimension stand for any other part of it to be later adjusted pragmatically involves a double metonymic shift based on domain expansion (indicated by <) and reduction (indicated by >):

> Any non-extreme negative part of the scale < the whole scale > any other part of the scale (to be determined pragmatically)

This being so, litotes follows the EIP just like any expansion/reduction metonymy. Since it works on the grounds of a scale, litotes needs to follow its structure and logic, as exemplified above. Thus, expressions like *It's not fairly/slightly unreasonable* are

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to be excluded as cases of litotes (they could be taken as literal) since they negate a part of the scale that is nearly midway between the two extremes. Only negating the end of a scale can exert a mitigating function.

Let us consider irony now. As was discussed above, irony is based on a combination of echoing and contrast. Echoing is based on full resemblance. Disrupting the resemblance between the original and the echoed thought can weaken or even nullify the ironic import of the utterance expressing the latter. For example, imagine a university student expresses his admiration for one of his professors: *Prof. Smith's a genius!* Later, professor Smith is found to have plagiarized much of his work. In the face of this situation, the bewildered student echoes his previous remark either fully (*Yeah, right,*) *Prof. Smith's a genius!* or partially but still conveying, through grammatically-based completion, the full thought (*Yeah, right,*) *a genius!* These utterances are ironic because they reproduce with accuracy the exact thought. A less than accurate reproduction of the original thought can affect the ironic effect seriously: *(Yeah, right,) an amazing researcher!* Here the EIP is active by default, since echoic mentions tend to preserve the structure and meaning implications of the original thought. However, there is still another principle at work, the tendency to maximize the echo, which we will briefly come back to in Section 4.3.2. The situation is not the same for the contrast operation in terms of the EIP. Remember that irony requires the contraposition of an echoed scenario and an observed scenario. Here, the EIP ensures that the items in contrast are those that share their generic-level structure, which in the example above is about the professor's (high versus moderate or even low) intellectual capacity and, in the context given, the degree of originality of his work (from extremely high to extremely low or even null).

Finally, consider paradox and oxymoron. With these two figures, there is also a contraposition, although a fully explicit one. The contraposition is only apparent, though, and it is sorted out by means of a reframing strategy, as in the case of *a sober drunkard*, discussed in 3.6. Reframing is not only a way to sort out the clash but also a way to realign apparently discrepant frames that in fact have the same generic-level structure configuration, which, for the example above, is a person's reasoning ability: a person can be drunk but deploy strikingly logical reasoning like a sober person. Note that, once reframing has occurred, we have correspondences between the reframed domain and the real-world situation that it applies to. The reframed situation acts as a source domain for the target in which there is a drunken person whose behavior is puzzling. The puzzle is solved through its correspondence with the reframed source where a person whose behavior is generally irrational and maybe even rowdy can suddenly say something that is rational, reflexive, and even moderate and calm. The person is still drunk, but his remarks can sometimes be lucid.

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4.2 The correlation principle

The Correlation Principle (CP) has been proposed and discussed elsewhere in its connection to metaphor (e.g. Ruiz de Mendoza & Pérez, 2011) and to metonymy (Ruiz de Mendoza & Galera, 2014, p. 143). For metaphor, this principle calls for the selection of the best possible source domain in accordance with the implicational structure of the target domain. What is understood by "best possible" is regulated by the balance between the pragmatic criteria of economy versus effect, as propounded in Relevance Theory (Sperber & Wilson, 1995). Of course, the coordination of these two criteria cannot have mathematical exactness. Rather, it is a "rule of thumb" procedure, used by individual speakers in selecting source domains, whose results can be felt as felicitous or not depending on the intersubjective judgment of a community of speakers. In a previous section, we motivated the reason why people can associate chicken's behavior with cowardice. In application of the CP, chicken would be good candidates to signal a specific type of cowardice involving nervousness or agitation and perhaps also small size and vulnerability. A focus on weakness and small size has been attested in the earliest uses of chicken in this metaphorical sense around the late 1700s and early 1800s (Ayto, 1998, p. 269). However, being called a chicken can now signal any type of cowardice through an extension of the term. Note that there are other timid and small animals whose behavior could be associated with cowardly behavior, such as rabbits, chinchillas, mice, deer, squirrels, and many birds. In terms of the CP, any of these animals could have provided good source domains. However, once a term has been used and accepted by speakers, i.e. it becomes conventionally associated with a specific metaphorical use, speakers will tend to avoid looking for further alternatives.

In its application to metonymy, the CP guides the search for the most relevant source domain in terms of its potential to afford access to the intended target. The CP thus explains why it is a common practice in hospitals to refer to patients by their ailments (e.g. *The gallbladder needs a new IV*), to hotel customers by their room number (e.g. *Room 3 is asking form a warm blanket*), and to customers at restaurants by their orders (e.g. *The mushroom omelet wants wheat toast as well*). In the therapist-patient relation the patient's illness is generally more relevant than many other knowledge items. In the hotel-customer relation, this role is covered by the room number (a strategy that may also work to refer to patients when the focus is on the hospital as a facility for inpatients). In a restaurant, the waiter-customer relation hinges on the customer's order. Of course, this does not mean that other metonymic sources are not possible if called for by special contextual circumstances. So, imagine that there is a particularly challenging patient. Nurses could easily refer to this patient by the trait that they hate most (e.g. *Mr. "Grumpy" is calling again*). In a hotel, an eccentric customer dressing like the famous American

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actor Mr. T could easily be referred to by hotel attendants as Mr. T instead of being identified by his room number. In a restaurant, any physical or behavioral peculiarity of a customer could have the same effect. For example, a customer wearing a conspicuous scarf in an attention-grabbing way could be referred to as *the scarf*.

The CP and the EIP cooperate in making figures of speech successful, i.e. capable of communicating the speaker's intended meaning. While the latter ensures that mappings preserve the generic-level structure of the source and target domains, the former leads speakers to select the best possible source. Obviously, any violation of the generic-level structure of the source or the target would have negative effects in the choice of the best possible source. If we map a person's body onto a tree, mapping the arms and fingers onto the roots not only violates the EIP but also renders the source pointless. Conversely, the CP also ensures that the EIP is fulfilled. Thus, in metaphor, looking at all the implications of the target concept leads the speaker to look for a source concept that has a comparable structure and logic. This will be a good candidate for a metaphoric source. Evidently, a source concept whose structure and logic is inconsistent with that of the target would be a bad candidate and, for this reason, it would have to be discarded.

Since the CP applies to metaphor and to metonymy, it follows that it is an active principle wherever there is a cross-domain or a domain-internal mapping. The CP thus applies to overstatement, understatement, paradox, oxymoron and all figures based on these. In the case of hyperbole, for example, the speaker's emotional reaction in the target situation is such that it calls for a scaled-up source. For example, we can call someone a Superman if we admire his physical strength. But Superman can only be "the best" possible candidate to capture the speaker's reaction of admiration if it is one of great astonishment. With understatement, what we have is a mitigated emotional reaction. When we call a bad wound a scratch, the CP has been used to capture the implication that the speaker is not worried about his wound at all. The reframed domains in paradox and oxymoron are also the best possible source domains to convey the implications that the speaker seeks for the target situation. In the expression *a sober drunkard*, which we have discussed above, looking for a reconstructed source that accounts for why drunk people can at points look sober is what conveys the necessary target meaning implications. The CP is also applicable to irony. However, this happens in a special way that will be discussed in 4.3.1.

4.3 Figure-specific principles: Adjusting scalar concepts and maximizing echoes and contrasts

The EIP and CP are general principles that constrain the use of figures of speech. However, there are other less general constraints that hold for some specific figures. Here we discuss some of these constraints in connection to overstatement,

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understatement, irony, paradox, and oxymoron. We also deal with variants of these figures when necessary to signal a relevant difference.

4.3.1 *Scalar symmetry and scalar pragmatic adjustment*

The *Principle of Scalar Symmetry* captures a tendency that applies to examples of understatement based on any part of a closed scale except its extreme points. These are excluded because using an extreme formulation to refer to its opposite would block the downplaying effect of the figure. Consider meiosis again. Imagine a seriously wounded soldier, who is aware that he is bleeding to death, saying: *It's just a scratch.* In general, it would be difficult to think that the dying soldier wants to play down the seriousness of his deadly wounds. In this context, the use of *scratch* would not be a good example of meiosis. However, in a context in which the soldier has not been wounded mortally, the same utterance can more readily have a downplaying effect and qualify as meiosis. Since litotes is used to downplay the negative effect of making an absolute negative statement, this figure follows a similar logic.

Now, to create an understatement, the speaker scales down the target concept through a mitigation operation, thus creating a source concept that has (usually) less negative impact than the target itself. The low source impact carries over to the target. If we have a closed scale, the target of a mitigated source will generally be a symmetric point in the (upper part) of the scale. For example, the sentence *It hurts a (little) bit* can apply to a situation where the speaker feels "a lot" of pain, but nothing extreme like unbearable excruciating pain. This default interpretation of "a little bit" as "a lot" corresponds to its symmetric point in the scale. Following a similar logic, *a small error* is *a big error* (*I think we made a small error in our calculations; we'd better not launch now*), *some distance* is *a long distance* (*The park is some distance for a walk*), and *sometimes* can be *often* (*He can sometimes be upset, we know*).

For all other situations of understatement and overstatement, the degree of strengthening or mitigation of a scalar concept is determined through the *Principle of Scalar Pragmatic Adjustment*. As noted in 4.1, the expression *not unreasonable* can refer to any degree of reasonability to be determined in terms of its consistency with the context in which it is used. Litotes thus adheres to this principle. The understated expression *I'm quite happy with my new job*, in a context in which we suspect that the speaker is more than just "quite" happy, suggests modesty and its interpretation hinges upon contextual factors. The same holds for hyperbole. For example, the ability not to make noise signaled in *He's as silent as a mouse* cannot be determined independently of the context (perhaps, the protagonist is only slightly less silent than a mouse or simply quite silent).

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4.3.2 *Maximization of echoes and contrasts*

We have discussed irony in terms of the construction of an echoic scenario that clashes with an observed scenario. We argued that an echo is defined as extreme resemblance. This means that there can be degrees of echoing and that, if an echo is not complete, this will affect the nature of irony. A weak echo will likewise weaken the ironic import of an utterance. In essence, there is a communicative need to maximize the echoic nature of an utterance for it to be clearly perceived as ironic. We gave a provisional example in Section 4.1 involving the repetition of an utterance. Let us now take a more complex example, based on echoing a thought. Suppose that someone suffers from joint pain, which gets worse with wet weather. He is in the middle of a very rainy season and is simply waiting impatiently for a sunny day. One day he runs the curtains to see dark clouds threatening with rain and exclaims: *Great. Just what I wanted. Another rainy day!* There is contrast between part of what he says and what is the case: the situation is not great, and it is not what he wanted. But the content of the exclamation *Another rainy day!* does not contrast with the situation in question. In fact, it is a faithful description of the weather prospects. It contrasts with the expressions of happiness and fulfilment of his desires, which would implicitly hold for a sunny day (*Great. Just what I wanted*). This is, therefore, an example where the utterance contains only part of an echo. The rest of the echo is reached through inference: by means of domain expansion, the expression acts a metonymic pointer to a broader scenario also containing what the speaker desires. In addition, the utterance expresses the contrast with the echoic representation. Note that simply saying *Another rainy day!* does not convey any irony, but disappointment or a complaint. We shall now consider three modified versions of this ironic utterance. The first one makes use of a full echo: *Great. Just what I wanted. A sunny day!* This utterance is more strongly ironic than the previous one because its echoic nature has been maximized. A second modified version makes use of a more partial echo: *Great. Another rainy day!* It is still ironic but slightly less so. A third version has a weaker echo: *Oh, that's good. Another rainy day!* Here, the expression *Oh, that's good* lacks the intensity of *great* as an interjection expressing appreciation and approval.

The tendency to maximize echoes is but a natural consequence of the CP. We can think of the echoed scenario as the source domain of a mapping. This scenario maps onto the observed scenario with which it corresponds in terms of sharp contrast (the clash). In searching for the best possible source, the maximization of the resemblance between the original utterance or thought and its echo has, as a consequence, a clearer contrast between the echoed and observed scenarios.

It is interesting to note that paradox and oxymoron also seek for the maximization of contrast. *A sober drunkard* is a good example since *sober* and *drunkard*

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are in full contraposition. It would be possible to create other maximized contrasts based on different aspects of our knowledge of drunkards: *an abstinent drunkard* could perhaps be interpreted as a drunk person that struggles to abstain from drinking but falls once and again; *a clear-headed drunkard* could refer to a person that has a strikingly clear mind despite his drunkenness (probably in a more sustained way than *a sober drunkard*). All these examples work as clear cases of oxymoron, each with its own meaning nuances. Non-maximized contrast, however, yields less straightforward cases of oxymoron. Some possibilities are: *a calm/moderate drunkard* (although not prototypical, a drunk person can be mild and calm); *a sensible drunkard* (again, intoxication makes people unreasonable, but exceptions to this are conceivable); *a non-indulgent drunkard* (drunkards are prone to excess, but there are people that cannot metabolize alcohol and get drunk with moderate amounts of it). In these cases, reframing is not necessary since the odd elements can be easily accommodated into the overall scenario.

5. Conclusion

The present paper has extended the notion of embodiment to figurative uses of language other than metaphor and metonymy. This has been done by looking at figures of speech (understood as specific conceptual patterns of figurative thinking) in terms of their relatedness, which, in turn, has required an analysis, on linguistic grounds, of their basic cognitive configuration, which takes the form of combinations of formal and content cognitive operations. We have examined both types of operations and related their cognitive activity to basic figures of speech such as metaphor, metonymy, understatement, overstatement, irony, paradox, and oxymoron. Then, we have explored other figures of speech, traditionally described in rhetoric and literary studies, with reference to these more basic ones: hypallage, anthimeria, anthonomasia, merism, and aphorisms relate to metonymy; simile, zoomorphism, allegory, analogy, paragon, synesthesia, and hypocatastasis, to metaphor; meiosis and litotes are cases of understatement; extreme case formulations and auxesis are forms of overstatement; antiphrasis, prolepsis, and sarcasm are linked to irony; paradox and oxymoron have been discussed as two variants of the same phenomenon, that is, the reframing of two clashing thoughts. This type of account endows the study of figurative language with either a direct rooting (for basic figures) or an indirect one (in the case of the rest of the figures) in embodied cognition. Finally, we have addressed the question of constraints on figuration. We have re-examined previous proposals on this topic, starting with the original one by Lakoff, which simply recognized the existence of invariant structural and

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logical connections, in terms of cognitive topology, across conceptual domains. We have evaluated and improved on later complementary proposals by the author of the present paper, such as the Extended Invariance and Correlation principles, first, and, second, the Scalar Symmetry and Scalar Adjustment principles. We have explored the first two principles in their application not only to metaphor, as in the previous studies, but to all relevant figures of speech discussed in this paper. The second two, which have had previous programmatic proposals by the author, have been treated in some more detail as figure-specific principles affecting figures involving strengthening and mitigation cognitive operations. Finally, for the first time in the literature, the present paper puts forward maximization as a phenomenon constraining figures based on extreme resemblance (echoing) and/or contrast.

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Metaphor as sign and as symbol

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Metaphors come as second nature to users of language because they are so often the norm. We trade in them deftly, to the point of seeming indifference to, and sometimes even ignorance of, their figurative natures. But the opposite is also true, since words that are offered with the plainest of intentions can be granted a metaphorical significance by those who wish to perceive it. In this paper we contribute to the debate about *deliberate* metaphors by exploring a related concept, the *potential* metaphor. Any text that supports a non-literal interpretation is a potential metaphor, regardless of its author's avowed intentions. We build on this distinction to model the mechanical generation of metaphors as an opportunistic process, whereby potential metaphors are converted into deliberate metaphors. We argue that the distinction between potential and deliberate is mirrored in that between signs and symbols, and demonstrate how this understanding leads to a more nuanced basis for generating and interpreting metaphors on a machine.

Keywords: signs, symbols, deliberate metaphors, potential metaphors

1. A clash of signs and symbols

The psychologist Carl Jung urges us to be wary of the profound differences between signs and symbols, especially as they relate to the interpretation of dream imagery and metaphors. "The sign is always less than the concept it represents", he tells us in (Jung, 1964: 55), "while a symbol always stands for something more than its obvious and immediate meaning." Jung uses the notion of "sign" here in its conventional semiotic sense, to denote an accepted placeholder for meaning that obtains its relevance from a network of connections to other signs in an overarching system of signification. We can point to a sign in a dictionary, a taxonomy or an ontology and say with some authority that it means this but not *that*. A symbol, by contrast, is not so easily corralled into a system of mutual discrimination and signification. Rather, cultural symbols possess indefinite halos of connotative association and emotional resonance whose limits are not defined *a priori*

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but tested and stretched by real-world communication with others. Signs permit an unquestioning leap from a signifier direct to its signification, while symbols encourage reasoning, inference, and collaborative elaboration in context.

Jung also cautions readers – with a claim that will seem especially apt to modern researchers of Artificial Intelligence – that symbols can never be traded for signs without a loss of meaning potential. He notes, ibid, that "no one can take a more or less rational thought, reached as a logical conclusion or by deliberate intent, and then give it 'symbolic' form." This claim also appears to be the nub of John Searle's *Chinese Room* argument (Searle, 1980), an infamous thought experiment that purports to demonstrate the insufficiency of mechanical reasoning for achieving real understanding. For no matter how intricate a system for manipulating tokens of signification may be, Searle argues that the best we can expect from these manipulations is the mere appearance of understanding, as the manipulating agent itself is never privy to the meaning of the utterances it produces from its own rules. Ironically, Searle refers to these tokens not as "signs" but as "symbols," arguing as he is against the *physical symbol system hypothesis* of Newell and Simon (1976). So while Searle is dismissive of symbol-processing, he uses the term "symbol" in the lesser sense Jung instead reserved for "sign," thus reducing his argument to a critique of mere sign manipulation. We can ask then whether machines are capable of true Jungian symbol processing, of going beyond reductive signs to find the "something more" behind them, and if not, what this might mean for their ability to produce metaphors?

Notwithstanding Jung's injunction against trading one for the other, we communicate in signs, not symbols. It falls to us as effective speakers and writers to choose and arrange our signs so as to evoke the desired symbols in the minds of an audience. As Raymond Chandler (1944) puts it in *The Simple Art of Murder*, the task of the writer is to pick a path to "what one wants to say" from "what one knows how to say." Yet, as Orwell argues in *Politics and the English Language* (1946), the careful alignment of signs to symbols is a responsibility that many writers fail to uphold. Bemoaning a decline in written English, Orwell frets that "prose consists less and less of words chosen for the sake of their meaning, and more and more of phrases tacked together like the sections of a prefabricated henhouse." His remedy is to look past signs and return symbols to the heart of communication, to "let the meaning choose the word, and not the other way around." To avoid surrendering to signs too soon, "it is better to put off using words as long as possible and get one's meaning as clear as one can through pictures and sensations." Once the signs that best convey a desired symbol are chosen, one can "switch round and decide what impressions one's words are likely to make on another person." Orwell fulminates against calcified metaphors that have become signs without symbols, tokens of signification that can no longer evoke the vivid imagery and feelings

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they once stirred in audiences. It is here that Orwell's dismal diagnosis and radical prescription confronts our own interest in metaphor production by humans and machines. Where he sees good reason to "never use a metaphor, simile, or other figure of speech that you are used to seeing in print," we spy an opportunity for the regeneration of symbolic potential in once-stale signs, an opportunity that can by exploited by humans and machines alike.

Orwell's repudiation of jaded metaphors, and his rallying cry for new metaphors to dislodge them from our political discourse, hold up a mirror to the contemporary debate about unthinking and "deliberate" metaphors in cognitive linguistics (see Steen, 2011;2015; Gibbs, 2015). In the following sections we strive to unify these viewpoints, to arrive at a computationally felicitous understanding of metaphor potential more generally. Note that we use the word 'deliberate' here, and throughout, in the sense employed by Jung, to denote the knowing use of signs or symbols by a purposeful agent to achieve a certain communicative intent. If deliberateness entails purpose and intent, then it might seem that consciousness must also be in the mix. However, since machines may exhibit the former without the latter (e.g., in systems that generate plans or make decisions) we consider the question of consciousness to only be a distraction from our primary goal. It certainly will not prevent us from ascribing deliberateness to our metaphor machines.

We begin in Section 2 by reconciling the distinctions of sign/symbol and deliberate/non-deliberate with Bowdle & Gentner (2005)'s perspective on the career of metaphor. This leads us to consider, in Section 3, how two speakers in a metaphor-driven discourse may operate at differing levels of deliberateness and symbolism, allowing the symbols of one to humorously trump the signs of another. In Section 4 we exploit this gap to show how new metaphors can be built from old, striking fresh symbolic sparks from clichés and stale turns of phrase. In Section 5 we consider two approaches to the contextualization of metaphor, before exploring, in Section 6, an approach to grounding that shows how metaphor can go beyond the realm of arbitrary signs to reference the world outside. Searle considered a machine's inability to ground its abstract signs as a fundamental brake on its ability to grasp the meaning of those signs, but we argue here that a practical grounding is sufficient to achieve human-like creativity when it comes to metaphor generation by machines.

2. Signposting the career of metaphor

We resort to a double-standard whenever we rate the freshness of figurative language, for while metaphors are often derided for their age – e.g., Orwell favored the labels "flyblown", "worn-out" and "useless", and pleaded for stale metaphors to be consigned to the writer's "dustbin" – the plain stock of our literal lexicon

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never seems old no matter how often we draw from it. Indeed, when metaphors die and take their place amongst their literal kin, we no longer deride them for their staleness and age, yet as they near their end they become ever larger targets for criticism. While we use each kind of language to convey meanings, deliberate metaphors carry the additional responsibility of simultaneously proclaiming a speaker's ambition, and it is in this role as a harbinger of creative intent that stale metaphors fall short.

However, it is likely that old metaphors are not just received differently from fresh metaphors, they are processed differently too. As metaphors age, our response to them alters both aesthetically and procedurally. As argued via a hypothesis that is intriguingly named the *career of metaphor*, Bowdle and Gentner (2005) suggest that very different interpretation mechanisms may be brought to bear on a metaphor to suit our level of familiarity with it. Specifically, the hypothesis makes space for two competing theories of metaphor to work together: the category-inclusion account of Glucksberg (1998, 2001) and the structure-mapping account of Gentner and colleagues (Gentner, 1983; Falkenhainer et al. (1989)). To see how the apparent novelty of a metaphor inevitably dictates how we arrive at an interpretation, consider the old chestnut "my lawyer is a shark." Since the word "shark" has been so liberally applied to people of a ruthless bent it has long since acquired a dictionary sense that captures the uncaring nature of predatory humans. If not already dead, the metaphor is certainly stale and highly conventionalized, and Glucksberg would argue that "shark" is no longer just a signifier of the class of sharp-toothed marine predators but of the category of all things that are unstoppably cruel. It is as a signifier of the latter category that the word is used here, so that "my lawyer" may be newly included among its membership. Yet think back to a time when the metaphor was fresh and the bond between the signifier and this category was not yet set. At a point when the signifier was still alive with symbolic potential, we must surmise that another mechanism allowed us to forge a link from conscienceless lawyers to cruel predation. Gentner and Bowdle argue that this alternate mechanism is analogical reasoning. In comparing the domain of lawyers to the domain of sharks, a reader will spot certain structural similarities between the causal representations of both. Mappings for water (to human affairs, perhaps) and prey (to litigants, or cash cows) and dogged pursuit (to lawsuits, perhaps, as in "I'll see you in court!") are established, and these parallels allow the properties of sharks and their prey to be projected onto the corresponding ideas in the world of jurisprudence.

Bowdle and Gentner claim it is analogy that does the initial spadework, to unearth points of overlap between source and target in novel metaphors long before these insights are eventually stored in a category-level model. To drive home this point, Thibodeau and Durgin (2011) ask us to consider the unconventional

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metaphor "a fisherman is a spider." As 'spider' does not conventionally denote a category of entities that patiently lures its prey into a trap, analogy is required to establish the mapping of fish to flies and nets to webs. (Oddly, Thibodeau and Durgin suggest the mapping of 'fishing *lines*' to 'spider *nets*,' which just goes to show that metaphor interpretation at the pre-conventional stage can be highly idiosyncratic). But conceptual processes other than analogy are also implicated in the shift. In "meat is murder" we find a metaphor that equates a whole industry with the most grievous of moral transgressions, but this is an equation that relies as much on metonymy as analogy. The analogy suggests parallels between two event-like structures, the industrial process of killing animals (target) and the act of killing a human being (source). While "murder" pinpoints the latter, "meat" offers only an imprecise metonymic pointer to the former. At its most symbolic, the metaphor uses "meat" to condemn not just those who kill animals but those who eat them too, as well as those who fail to object. Yet as the metaphor has become a facile slogan to suggest a moral choice, it has lost its power to shock, move and persuade. The metaphor as a whole has become a sign for a particular lifestyle and social attitude that allows us to make certain assumptions about its bearers. The word "murder" has also undergone a career shift, with its metaphorical uses often carrying a hint of ironic exaggeration, as in "shoe shopping is murder on the feet." So notice how the career of metaphor also entails a career of metaphorical symbols, where potent symbols in the Jungian sense gradually give way to signs that conveniently allow audiences to converge more rapidly, and with much less divergent inference, from a familiar metaphor to a consensus interpretation. We can think of signs as atrophied symbols that have surrendered much of their power to suggest more than they explicitly state. So as metaphors age, they necessitate less divergent processing of symbols and more convergent processing of signs, until the use and comprehension of conventionalized metaphors becomes unthinking and far from deliberate (Steen, 2011; 2015).

3. When symbols trump signs

As maturing metaphors become more convergent with age, different people may nonetheless diverge in their individual approaches to interpretation. As the many become numb to the possibilities of a metaphorical conceit, the few may remain alive to its symbolism. Though there is little benefit in being amongst the latter from the perspective of a metaphor producer, there is a creative advantage to being a consumer of symbols in a world of signs. For in a context where metaphors are used to justify and persuade, there is value is being able to see, as Jung put it, that a calcified sign can "stand for something more than its obvious and immediate

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meaning." Arguments that involve an exchange of metaphors in a *winner-takes-all* contest of ideas can turn on the rejection of one metaphor in favor of another, so to dismantle an opponent's arguments we must first deliberately dismantle their metaphors.

Argument is, after all, a process of deliberation, and as argued by Veale, Feyaerts and Brône (2006), it pays to view the non-deliberate metaphors of others as quite deliberate when one seeks to obtain a humorous advantage. Those authors define *trumping* as an adversarial use of metaphor in which one speaker's conventional metaphor, cliché or platitude is undermined by bringing a *hyper*-understanding of the metaphor's symbolic origins to bear. For example, on the night when Winston Churchill lost the 1945 election, the consoling platitude "think of it as a blessing in disguise, dear" earned Churchill's wife the rebuke "well it's a bloody good disguise!" Muhammad Ali recounted the tale of being told to "buckle up" when on an airplane as it was about to depart. His metaphorical reply to the stewardess, "Superman don't need no seat-belt!" reflected Ali at his peak, yet he was resoundingly trumped by her riposte, "Superman don't need no airplane neither." In each case the respondent appears to agree with the speaker, and appears to take the speaker's metaphor at face value. Yet by bringing a deliberate analysis to bear, of the metaphor's symbolic potential to evoke a source domain rich in ideas, the respondent succeeds in turning the metaphor against its user. This divergence sits at the heart of the debate around deliberate metaphors (Steen, 2011;2015), though it reveals that deliberateness can apply just as much to the interpretation of metaphors as to their production and use.

The deliberateness debate covers much of the same ground as the debate about cliché and stale metaphor that animated Orwell's 1946 essay. Orwell showed all the zeal of the eugenicist in his desire to cleanse English of its "huge dump of worn-out metaphors which have lost all evocative power," because, he believed, "the slovenliness of our language makes it easier for us to have foolish thoughts." Humorous gambits such as trumping certainly punish the slovenliness of lazily-used metaphors, but the humour that arises owes as much to the hackneyed metaphor as to its symbolic reimagination. To claim, as Orwell does, that one should avoid all over-exposed metaphors is to succumb to what Pullum (2008) calls "a load of Orwellian cobblers." Notice, for instance, how Pullum's denunciation of Orwell lends a special resonance to that most overused of dystopian clichés, "Orwellian." Familiar metaphors need not always be used for entirely familiar ends, and the age or familiarity or even conventionality of a metaphor offers only a statistical basis for guessing at the creativity with which it is used. Rather, the true measure of creative intent in a linguistic metaphor is the extent to which a speaker engages with the symbols behind the signs, and forces a listener to engage with them too. As Ricks (1980) argues in his defense of language's journeymen, "Instead of banishing

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or shunning clichés as malign, haven't we got to meet them, to create benign possibilities for and with them?" Just how benign those possibilities might be will depend on one's point of view, especially if one's goal is humour. The apotheosis of the engagement view is to be found in William Empson's sly repudiation of Orwell's proscriptive agenda. By marrying two of the most jaded metaphors in English to dismiss Orwell as "the eagle eye with the flat feet," he showed that donkeys *can* win derbies, yet only when purposeful riders take the reins (Veale, 2012).

4. Needles in a metaphor haystack

We can give deadbeat metaphors a new lease of life by looking for symbols where others see only signs. As a creative strategy, re-analysis applies just as much to the dead and buried as to the jaded and highly conventionalized. Dickens, for example, opens *A Christmas Carol* (1843) with a disquisition on the symbolism of the idiom "dead as a doornail." Finding little in the way of mortality about this kind of nail, he is moved to "regard a coffin nail as the deadest piece of ironmongery in the trade." A dead metaphor begets a living one, even when its symbolic origins are the stuff of just-so stories. Indeed, anything at all that merely resembles a metaphor can beget other metaphors. We define a potential linguistic metaphor as any arrangement of words that supports a metaphorical interpretation, whether or not it has been intended to do so by its author. For if metaphors can be used without deliberation and profitably analyzed as though they were the products of deliberate creativity, nothing stops us from looking for metaphors wherever signs are used to convey meanings. Seeing potential metaphors anywhere we go allows us to be continuously inspired by the world around us.

Potential metaphors often occupy the uncertain middle ground between a deliberate figurativeness and a presumed literalness. Consider the title of George Lakoff's *Women, Fire and Dangerous Things* (1987). Nothing in this arrangement of words dictates that the title should be interpreted as a metaphor, although the book's subtitle, "What categories reveal about the mind," does suggest that the title also names a category of things. Since fire can certainly qualify as a dangerous thing, our search for a coherent reason for the title encourages us to see women as belonging to this category too. Yet there is no reason in principle why we shouldn't approach this title as we approach C.S. Lewis's *The Lion, The Witch and The Wardrobe*, namely, as a list of intriguing if seemingly mismatched elements that the book will presumably knit together into a single, satisfying narrative. Of course, there will be no doubt in the minds of readers that Lakoff's title should be read as a metaphor, since his book later makes this point plain. At issue then is the idea that metaphors are often indeterminate, so that any arrangement of signs that permits

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a reasonable literal interpretation – such as e.g., this book will talk of women, it will talk of fire, and it will talk of dangerous things – is always just a potential metaphor insofar as it fails to force a non-literal reading. In contrast, the title of Gerald Durrell's *My Family And Other Animals* provides precisely this force, since its use of "other" makes us equate the members of the author's family with the animals in his zoo.

Deliberate metaphors emerge out of potential metaphors because it is the deliberate act of interpreting them as metaphors that makes them so. To build a machine that can generate metaphors of its own, we can either try to understand metaphor production from first principles, so as to build our new metaphors from the conceptual foundations up, or we can choose to build new and deliberate metaphors from the potential metaphors that reside in abundance in any body of text or any source of semiotic stimuli. For our current purposes, this abundance is provided by the Google n-grams (Brants and Franz, 2006), a vast database of snippets of web texts of between 1 and 5 tokens in length; an *n*-gram is any contiguous sequence of *n* tokens – words, numbers or punctuation marks – that is found in a text. Consider, for example, the 3-gram "romance and insanity" to which Google assigns a web count of 313 documents. When read as a simple coordination structure the phrase says as little as "women and fire" or "lion and witch". Pragmatically, however, readers will ponder the reasons for squeezing two ideas of opposing sentiment into a single unit, and may seek to unearth a figurative kinship that links the two. With enough knowledge of words and the world at their disposal, readers may beat a path from madness to love, and one might even repackage the resulting kinship in the following way:

> It used to be that romances were enjoyed by beloved lovers. Now I say unto you that romance is insanity from which only hateful fanatics suffer.

While this framing may speak to any reader who has experienced the highs and lows of romantic attachment, it was in fact produced by a machine that draws on a rich inventory of stereotypes (e.g., of lovers and fanatics) and of familiar situations (e.g., falling in love, suffering from an affliction). These archetypes allow it to find myriad symbolic connections behind the signs "romance" and "insanity." The use of language associated with religious discourse (e.g., "I say unto you") is just one of many strategies the machine uses to package its mechanical insights as deliberate metaphors and thereby provoke an emotional and intellectual response in readers. The machine is named *MetaphorMagnet*, and the results of its deliberations can be sampled on the hour in the tweets of its Twitterbot incarnation, *@MetaphorMagnet*.

The name *MetaphorMagnet* derives from the machine's main generation strategy: searching for potential metaphors in web n-grams with the copula form "A is

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B" or "A is a B" and the coordinated form "A and B." It always attempts to interpret these forms as deliberate metaphors, using the specific associations of A and B to explore how B might partially mirror A. While most n-grams satisfying these forms will yield nothing, the database of n-grams is so large that millions of new metaphors will still be generated. It hardly matters if the n-grams that do yield successful analyses were never meant to be understood as metaphors, since the strategy looks to n-grams for linguistic inspiration, not corpus evidence. Inevitably, our magnet will extract needles from its haystack that turn out to be the verbal expression of metaphor schemas in the mold of Lakoff and Johnson (1980), such as "Life is a Journey," "Time is Money" and "Argument is War" to say nothing of famous lines from poetry and song such as "love is a battlefield." These n-grams are interpreted using exactly the same symbolic search mechanisms as "meat is murder" and "love is a game" and "romance and insanity."

Metaphor Magnet relies on a logical representation of norms and beliefs that old-school AI researchers describe as "symbolic AI" (e.g., Newell and Simon, 1976). This serves as a logical basis for most computational models of analogy or metaphor, from Falkenhainer et al. (1989) to Hofstadter et al. (1995) to Veale and O'Donoghue (2000) to Barnden (2006). For instance, the propositions *lovers enjoy romances, lovers are beloved, romances are sweet, fanatics suffer-from insanity* and *fanatics are hateful* are just some of the many propositions that Metaphor Magnet can reach from the signifiers "romance" and "insanity" in its divergent search to unify these two terms. To imbue its deliberate metaphors with semantic tension, Metaphor Magnet is especially drawn to semantic oppositions, such as *hateful* versus *beloved*. This is a highly concentrated exploitation of our very human attraction to the meaningful incongruity of jokes and witticisms, as modeled in theories – such as the *SSTH*, or semantic script theory of humour (Raskin, 1985) and *GTVH*, or general theory of verbal humour (Attardo and Raskin, 1991) – that see semantic opposition as the inciting spark of humour. In choosing to pursue romance and insanity as a deliberate pairing. Metaphor Magnet hypothesizes that *if* romance truly were a kind of insanity, lovers would be more like fanatics, so that lovers would be more hateful and fanatics would be more beloved. Of course, the machine knows nothing of how jealousy and rejection can sour love into hate, or of how fanatical zeal can inspire love for those who would kill what they hate. But it is enough that it can frame the opposition in such a fashion as to nudge human readers to bring their own experiences of the world to bear on the final textual rendering.

Metaphor Magnet's forced analysis of potential metaphors as deliberate metaphors is only as insightful as the representations that underpin it, so it is convenient that figurative language often gives back as much as it takes. As shown in Veale (2012), the machine acquires many of its associations and norms from the

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low-hanging figurative fruit of the web, such as similes with explicit ground terms. For example, when the query "as hateful as a" is posed to the Google search engine, the retrieved texts offer "toad", "mass shooting" and "Russian autocracy" as simile completions. Automating this process so that it can operate on a massive scale, Metaphor Magnet obtains a wealth of symbolic associations that it would never find in a dictionary.

5. Metaphor in the moment

The three challenges faced by any user of metaphor are, broadly speaking, knowing *what* to say, knowing *how* to say it, and knowing *when* to say it. As discussed earlier, Raymond Chandler saw writers as explorers who must go from the *what* to the *how* in as clean and elegant a manner as possible, and Metaphor Magnet conducts a similar search along mechanical lines. Yet the machine still falls short with regard to the *when*. Metaphor Magnet generates and stores millions of vivid metaphors during its sweeping passes over the Google n-grams, so that it can later pluck any of these metaphors from its database whenever it is called upon to serve up a new metaphor. Its incarnation as a Twitterbot, @MetaphorMagnet, avails of this abundance to tweet a randomly plucked metaphor every hour on the hour, and while each is well-formed and internally meaningful, and perhaps thought-provoking too, most fail to speak to the moment. @MetaphorMagnet's metaphors are deliberate in construction but they are very far from deliberate in delivery.

Most metaphors are created as a response to what others have said or done, so a maker of metaphors that lacks a model of context might still rely on an interlocutor to tacitly provide some context by what it says or does. For this reason we have built an interactive version of Metaphor Magnet, as a public web service that both humans and machines can avail of. Humans use a web browser[1] to query the service and to interact with its suggestions, while machines do much the same without the intermediary of a browser, obtaining XML-structured data directly. Let's consider the service from the perspective of a human interlocutor. A user can enter specific target terms, such as "love" or "life" or "war" or "religion", and obtain a range of related metaphors in return. Upon entering the target "politics", for instance, the user is presented with an array of possible metaphors that the system has acquired or invented during its sweep through the Google n-grams. These range from "[politics is a] challenging sport" to "[politics is an] ugly mess" to "[politics is a] dirty sin". In each case, the given target concept is equated to

1. The website may be accessed via the URL *http://bestofbotworlds.com*

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the combination of a salient quality (such as *ugly* or *dirty*) and a source-domain concept, such as a *sport* or *mess*. For single-term user inputs such as "politics," the system first searches for any copula metaphors in the n-grams of the form "politics is [a/an] X" such as "politics is myth" (web count 3948), "politics is war" (867), "politics is religion" (116), "politics is rubbish" (96), "politics is poison" (47), "politics is a joke" (99) and even "politics is a disease" (46). Using its symbolic models of the stereotypical qualities of those source concepts, the service composes new metaphors of its own that accentuate many of the same patterns of qualities in the target. Users are thus presented with a mix of the commonplace and the novel, and can choose to further explore any that pique their interest. These metaphors are context-free in the manner in which they are presented, yet capture a wide variety of contexts in which the target might be understood. It falls to users to select the appropriate context by clicking on the favored metaphor.

In cases where users enter copula metaphors of their own – such as "life is a game" – the service proceeds in the same way, though it prefers those new metaphors that emphasize many of the same aspects of the target as the user's own pairing. The context of each new metaphor is assumed to align with the tacit context of the user's own, and the system never tries to model this context explicitly. Rather, it assumes that its own responses to a user's input will preserve and extend the context that the user imagined for it. In other words, it assumes that copula metaphors serve as their own contexts. When a user enters "meat is murder," this supplies enough context for the service to offers up these compatible metaphors: "[meat is a] threatening virus," "[meat is a] perilous evil," "[meat is a] burning sin" and "[meat is an] alarming outbreak." If a user now drills down into "burning sin" – this elaboration is, after all, the closest to the user's own metaphor, and the one that suggests the clearest moral stance – Metaphor Magnet will display its own interpretation of this metaphor as the set of qualities that it believes to be profiled in the target. This is not to say that the system's interpretation of the chosen metaphor is ever complete, or objectively correct. Metaphors are ambiguous and open-ended, so what the system provides as its analysis can only be viewed as a starting point for further interpretation by the user.

Since metaphors are easiest to appreciate in the flesh, the system's own offerings should be rendered in a polished linguistic form. Yet, because the system cannot hope to squeeze the full potential of a metaphor into a single sentence, it gives the user a machine-generated poem instead. Poetry serves many purposes, but the service uses it as a summarization device, to distill the many rendering possibilities of a metaphor into a coherent form. Unlike most machine-generated poetry, which emphasizes meter and rhyme over meaning and symbolism, Metaphor Magnet's poems are generated as blank verse so as to showcase all of the rendering strategies at its disposal. Users need only click a link to have any metaphor woven

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into a poem. The following is one such poem, as generated for "meat is a burning sin":

No Sin Burns More Terribly
Terrify me with your edible fruit
By perverted religions are meats punished,
and meaty love do these religions promote
The most despicable racist is not more blatantly criminal
Reward me with the perishable fruit of your sin
Let your tempting meat excite me
Did ever a crime cause a more terribly heinous sin?
How you pollute me so terribly, like an ugly sin
Does any sin burn more terribly than this meat?
You degrade me with your terrible immorality
Organized sins do disorganized religions sometimes proscribe
Even if you were a feared criminal wouldn't you want to
commit this sin of beloved angels?
O Meat, you menace me with your criminal seduction

The poem draws together different elaborations of the same metaphor (i.e., *meat is a burning sin*) and related others that stress the same qualities (e.g. *meat is a forbidden fruit*). We see crime, pollution and religion metaphors in these lines, albeit framed as similes, superlatives or rhetorical questions. Notice how this poem, and others like it,[2] are tacitly influenced by context. Each poem is a deliberate response to the user's guiding metaphor, and is thus systematically shaped by that stimulus. So, insofar as each elaboration of a user's chosen metaphor develops the same base, each suggests a family resemblance to the others. Thus, by focusing on *sin*, the poem's individual metaphors pull in the related ideas of *crime, religion, immorality, seduction* and *temptation*, and show these as similar by virtue of their obvious links to *sin* and less obvious links to *meat*. While this mutual reinforcement may be an artifact of the system's symbolic nature, it is no less effective for that.

5.1 Metaphors in the news

Metaphors allow us to speak about events in ways that significantly depart from the norm, and so, when responding to the same event, we can expect a deliberate metaphor and a literal or conventional exposition to share a deep, but not a superficial, similarity. While each may speak to many of the same underlying topics using different words, statistical topic modeling allows a machine to identify

2. Generate a new variant of the poem for yourself at: *http://ngrams.ucd.ie/metaphor-magnet-acl/p?source=burning:sin&target=meat*

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the latent topics that are present in a text and thereby quantify the deep similarity between a metaphor and the literal rendering of an event. The intuition here is that for a literal text, the surface form and its literal meaning bear a clear similarity to each other, while in a metaphor the surface form disguises its secondary figurative meaning. When extracting latent topics from metaphors and their literal paraphrases, we can expect these deeper representations to exhibit a stronger resemblance to each other than their superficial forms might suggest. So, in an evolving news context, a topical variant of Metaphor Magnet might select and rank apt metaphors using a measure of latent topic similarity to incoming news headlines.

Latent Dirichlet Allocation, or LDA (Blei et al. 2003), builds a statistical topic model of a body of texts on the assumption that topics are generative, and so influence the choice of words in the documents that instantiate them. Most documents will show the influence of multiple topics, so it is the task of LDA to first identify a fixed set of topics that best explain the observable similarity between documents. Once this topic set is constructed, LDA then allows each document to be characterized as a vector of topic probabilities. This expresses the relative influence of each topic on a document's content. An LDA model thus corresponds to a highly compressed semantic space of fixed dimensionality – n topics yields n dimensions – in which each text is represented by an n-dimensional vector of topic probabilities for all topics. The angle between any two vectors is indicative of the differences between vectors and thus of the differences between texts. The cosine of this angle is a useful measure of the deep similarity of two texts since the cosine of 0 degrees (no angle, so a tight fit) is 1 and the cosine of 180 degrees (the largest possible angle between vectors) is −1. We assume this similarity to be a *deep* similarity since the compression of a nuanced data set into, say, a space of 150 dimensions necessarily entails a high degree of generalization.

This allows an LDA model to take texts that speak to the same topics using different words and map them into the same locality in a space. Since we wish to measure the angle between the LDA vectors of news headlines and the vectors of different metaphors, a single topic model is constructed over a composite dataset that unites a large corpus of headlines with a large collection of metaphors. For the former we harvested several years of news stories from the websites of mainstream media outlets such as CNN; for the latter we asked Metaphor Magnet to generate 10 million metaphors from the Google n-grams. A model of 150 topics – which represents an empirical trade-off between generality and specificity – is built from the joint dataset.

Each of these 10 million metaphors is assigned a 150-dimension vector. These serve as the fixed stars in the model's semantic firmament, to which the newly arriving headlines of breaking news stories can be compared. So as headlines arrive over Twitter, from *@CNNbrk*, *@BBCbreaking*, *@WSJ*, *@FOXnews*, *@Reuters,*

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@*nytimesworld*, and @AP, they are mapped onto topic vectors by the model and compared to vectors of known metaphors to identify the nearest matches. The model is recomputed at regular intervals to incorporate new stories, so it can keep pace with the cultural Zeitgeist. For instance, the *#MeToo* movement is at present dominating the news, with nightly reports of sexual harassment in workplaces as diverse as the media, film and TV, and government. One story of peak interest at the time of writing concerns senate candidate Roy Moore, who stands accused by multiple women of predatory behavior against adolescent girls. Though the offenses date back many years, the *#MeToo* movement has given them a new public airing. An LDA-driven, news-sensitive version of Metaphor Magnet, in the guise of a Twitterbot named @MetaphorMirror, responds in the following way to this headline (see Veale et al., 2017):

> **@Buzzfeed:** "He did not perpetrate sexual misconduct with me…but I now know for sure he is a liar," said a woman who claims she dated Roy Moore when she was 17 and he was 34
>
> To some oppressors, every victim is a harmless child.
>
> To others, every victim is an overwhelming fire.

The LDA-mediated mapping between headlines and metaphors often seems gnostic in its imagery. What, for instance, is the symbolism of *fire* above? Does it refer to the tide of anger that has swept the public sphere since the shocking revelations concerning Hollywood producer Harvey Weinstein? Does it represent the righteous fire of judgment and condemnation? Or does it suggest the destructive consequences of corruption? The model refuses to say, limited as it is to just 150 numeric dimensions, each without a name. But we are on surer ground in seeing the relevance of "victim," "child" and "oppression," since the unfolding Moore saga has given the topic model a diversity of headlines that nudge new Moore headlines into this dark corner of the LDA space. So, far from dimming the allusive charms of metaphor, the use of this reductive mathematical model actually heightens the mystery of interpretation, encouraging audiences to bring their own insights to bear when exploring the symbolism of even machine-generated metaphors.

6. Metaphors on the ground

As much as we need to heed Jung's distinction of symbols versus signs, our computer implementations tend to view these ideas as interchangeable. For instance, it is convenient to view signs as *lexical* tokens that correspond to words in a natural language like English, and to view symbols as *semantic* signs that derive their

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usefulness from their logical connections to others. So we do exactly what Jung cautions against, and trade symbols for signs in our representations. Searle's arguments about the insufficiency of syntactic manipulation of tokens of any kind still hold water unless we can show how our tokens can relate to the world outside their closed logical systems. To do this, we must call on signs that already possess an external reference.

Symbols in the Jungian sense are richly evocative: they both denote and connote. Consider just one connotative dimension of a symbol, its ability to vividly suggest a colour in the mind's eye. A red rose, blood and gore each suggests a similar shade of red, but in doing so each also brings its own aesthetic and affective overtones to our appreciation of the colour. The red of roses is different than the red of wine or the red of a cardinal's biretta, and so, conversely, a specific colour tone may be suggestive of the symbol with which it is associated in our imaginations. So we should do more than associate the symbols *rose, blood, wine, cardinal* or even *anger* with a sign like *red*: we should use colour symbols that are richly evocative of the right shades and tints of the colour red. We can, for instance, use the RGB colour coding system of a TV or computer monitor. With a numeric value for each of the three additive colour components Red, Green and Blue, RGB codes can specify millions of colors and shades with a six-digit hexadecimal code such a D43800 (the red of paprika) or F6E7B8 (the yellow of parmesan). It is true that we are trading one kind of sign for another here, for what else is a token like D43800 but a sign that only makes sense within a code system? However, these tokens have purchase in the external world that other signs do not: they can be used to paint the associated colours on a screen, or they can map the colours in a camera image to the relevant signs and symbols. They link the symbols behind our words to the world of human perception, and in this sense they can be said to provide a grounding for our symbols.

This being the case, we can expect a metaphor maker that is grounded in this way to generate more compelling colour metaphors than one that is not. Consider the challenge of naming a specific colour with a vivid metaphor. Paint makers rely on colour metaphors (their catalogues are full of them) to sell paints that, in perceptual terms, have the same shades as a competitor's. Yet can a metaphor machine use RGB-grounded symbols to create colour metaphors that are deemed to be just as creative and descriptively apt as those created by an embodied human? This is a task we set ourselves here. Metaphor Magnet will seek out potential colour metaphors in the Google n-grams and transform these, when possible, into deliberate colour metaphors that can be compared in a blind test with the products of human ingenuity. To ground the system's symbols, we first build a colour lexicon that maps from lexical signs, such as "rose," to the signs for the corresponding colour term, such as "red", as well as to the most conventional RGB code, such as

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F19CBB (rose-red). We begin by collating n-grams of the form "X-colour" such as "wine-red" and "sky-blue" in which an archetype is used to suggest a specific colour. We then use the web-site ColourLovers.com to find the most appropriate RGB code in each case. The resulting lexicon provides over 1000 mappings of archetypes to colours and RGB colour codes.

We consider the lexical signs associated with RGB codes in this way to be the names of colour archetypes. To identify potential colour metaphors in an n-grams database, we can simply harvest all 2-grams XY where both X and Y name a colour archetype, such as "chocolate sky" or "paper tiger." While past users of "paper tiger" may not have used it to name a colour, it has the potential to be used in this way, perhaps to name a blend of paper-white and tiger-orange. Likewise, "chocolate sky" can be taken as the name of a blue-brown blend of chocolate-brown and sky-blue. We are guided by n-gram frequency when harvesting potential metaphors, since this is a good indicator of phrasal well-formedness. While "paper tiger" has a web-count of 25,690 in Google's database, "tiger paper" has a web-count of just 100. As we cannot be sure that any given 2-gram is a valid English noun-phrase, we accept "paper tiger" and reject its less frequent inverse, "tiger paper."

To turn these *objets trouvés* into colour metaphors, we must assign an RGB code for a specific colour to each phrasal form. But what is the colour of a "paper tiger," a "midnight sun" or an "alien brain"? We make a rather simplifying assumption and calculate the midpoint in RGB space between the RGB colours of the two component words, to generate a 50:50 colour blend. So, "banana curry" denotes a mix of 50% banana-yellow (FFE135) and 50% curry-brown (DA9E19). Each trio of colours – the two component colours and its resultant blend – can be considered as a colour scheme in the RGB colour space. This space can be visualized as a wheel, in which the primary colours are located at equidistant locations and all other hues are placed so as to reflect the relative contribution of the primary colours to their makeup. Every RGB colour scheme must draw its colours from the RGB colour wheel, but an analogical colour scheme (Pentak, 2010) further requires that its colours are chosen from adjacent areas of the wheel. This ensures that any blend of these colours is likely to be a harmonious one. We can observe analogical colour schemes in nature – they are considered 'analogical' for this very reason – such as in the turning of autumnal leaves. As leaves change colour in autumn from green to yellow-orange to brown-red, their shifting hues slide across adjacent areas of the colour wheel. So to encourage harmonious blends, we require that the chosen colours and their 50:50 blend make up an analogical colour scheme. In combination with our large stock of RGB colour stereotypes, analogical combinations allow us to generate an even larger trove of colour metaphors with specific RGB codes.

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To evaluate these pairings of names and colours, we compared them to the names chosen by humans for much the same RGB codes on the website *ColourLovers.com* (Veale and Alnajjar, 2016), This site is frequented by colour enthusiasts who suggest their own creative names for specific RGB values. The site also invites users to comment on and vote on names, where these votes are called "loves" by analogy to Facebook's "likes." A cursory examination of the site's many colour names suggests that metaphor and metonymy are common strategies. Many names allude to shared cultural or emotional landmarks, and generally aim to evoke a mood as well as an idea. It is not our intention here to deconstruct the mechanisms favored by users of *ColourLovers.com* to invent new colour names, but to use this source of attested pairings of colours and names to test our own metaphor generator.

We downloaded the top 100,000 name/colour pairs from the site,[3] ranked from most to least *loves*; the mean number of *loves* per RGB code is 13, while each code has at least one *love* and just one human-assigned name, since the site does not permit multiple names for the same RGB code. It is important to note that the human creators of these names were not paid for their services. Rather, as the name of the website suggests, these creators do what they do for the love of all things colour-related. Neither is metaphor the only creative strategy they seem to favour when crafting a name. Rather, many names appear to be chosen for their metonymic, emotional or cultural resonances as much as for any deliberate mapping from a source to a target domain. Nonetheless, for comparison purposes we need to establish an alignment between the named codes on the website and those named by Metaphor Magnet. We first map each RGB code into the CIE LAB colour space, as distances between points in this space will more naturally reflect differences in colour as perceived by humans. We can then use the *Delta E CIE76* function to calculate the Euclidean distance between two colours in the CIE LAB space. When comparing a colour code generated by Metaphor Magnet to a colour code from *ColourLovers.com*, we allow both colours to differ by no more than 14 according to this distance function and still be considered the same perceptual stimulus. We chose this threshold value of 14 empirically, after experiments with 141 named HTML colours.

We chose 2587 of ColourLover.com's named colours for a comparison. The mean number of "loves" for this name/colour set is 2.188. Each colour can be aligned to one generated by Metaphor Magnet within the tolerances of the distance function, allowing us to present both names (machine versus human) to

3. http://www.colourlovers.com/colors/most-loved/all-time/meta

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human subjects in an empirical test. We used the crowd-sourcing platform *CrowdFlower.com* for our experiments. A swatch of each colour and a choice of names, one human-generated *and* one machine-generated, was put before human judges, who were asked to take a moment to imagine the colour being used. The ordering of the names was randomly decided on a case-by-case basis, so that the human-generated name was listed first in 50% of cases, and the machine-generated name was listed first in the other 50% of cases. In all cases, judges were *not* told of the origin of any name. Each judge was paid a small sum to answer the following 4 questions:

1. *Which name is more descriptive of the colour shown?*
2. *Which name do you prefer for this colour?*
3. *Which name seems the most creative for this colour?*
4. *Why did you answer these questions the way you did?*

The fourth question is a source of qualitative data that may yield insights into the factors that shape our appreciation of colour metaphors. All judges were timed on their responses, and those that spent less than 10 seconds presenting their answers for any colour/name were classified as *scammers* and dismissed. We also required that each question be answered by 5 non-scamming judges to be trusted, and in this way we obtained 12,608 trusted judgments for evaluation. Another 5,040 untrusted judgments were ignored. It is in the nature of crowdsourcing experiments such as these that we know very little about the judges we recruit. Perhaps it would be preferable to use only judges with accounts on *ColourLovers.com*, but that might influence the results so as to unduly favour the naming aesthetics of that community. In the end, our chosen crowdsourcing platform allowed us to recruit judges from countries where English is widely spoken as a first language. It was left to us to remove unsuitable judges with the simple tests described above.

The experiment was terminated after its budget of $220 was exhausted, at which point 940 judges had been paid to contribute to the task and 1578 of the 2587 colours had received five trusted judgments for each question. It is on the judgments for these 1578 colours that we based our evaluation. Tallying individual judgments per question, we see that 70.4% for *most descriptive name* (Q1) favored the machine; that 70.2% of judgments for *most preferred name* (Q2) favored the machine; and 69.1% of judgments for *most creative name* (Q3) favored the machine. Similarly, when we tally the majority judgment for each question under each colour – the choice picked by three or more judges – we see that for just 354 (23%) of the 1578 colours, a majority of judges deemed the human-assigned name to be more descriptive than that assigned by the machine. The results for the next two questions, Q2: *which name do you prefer?* and Q3:*which name is most creative?*,

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are in line with those of the first question. Only for 355 colours does a majority of the five human judges for a given colour prefer the human-assigned name over that assigned by the machine, and only for 357 colours does a majority consider the human-assigned name to be the more creative of the two. This consistent breakdown of approximately 3-to-1 in favour of the machine suggests that machine-generated colour metaphors can be more than competitive with human creations when the machine grounds its symbols in ways that we humans take for granted.

7. Summary and conclusions

While we communicate with discrete signs, our most effective metaphors – and certainly our most deliberate – exploit cultural symbols with diffuse halos of shared sentiment and connotation. Symbols add to the elasticity of our interactions because there is no obvious limit to their evocative power. In this paper we have presented a variety of systems and implementations that attempt to capture the resonance of symbols in a machine dedicated to the task of deliberate metaphor generation. Sitting at the head of this family of systems is Metaphor Magnet, a public web service and a Twitter *bot* that pursues an opportunistic approach to metaphor generation. Distinguishing between potential and deliberate metaphors, our metaphor machine trawls a very large corpus of textual scraps for the web equivalent of *objets trouvés* – phrases with the symbolic potential to be deliberately read as metaphors. As described in detail in Veale (2015), the system prizes phrases that evoke a tension between different cultural norms or stereotypical expectations. Its interpretations of the metaphors suggested by these phrases are packaged in a diversity of ways that further exploit the conventions of topic and genre. But while a single packaging strategy reveals just one facet of a metaphor, a poem allows a metaphor system to compress many mutually-reinforcing renderings and perspectives into a single generative artefact. As described in Veale (2013), a functional poem is an internally consistent structure that compresses and suggestively summarizes a space of figurative possibilities. As shown here, we view these machine-generated poems not as aesthetic artefacts in their own right, but as convenient viewfinders akin to linguistic kaleidoscopes. Users peer, and perhaps ponder, before twisting the lens to generate another swirl of words and another batch of interlinked metaphors.

Yet for all that, readers have some justification for thinking that we only pay lip service to Jung's distinction between signs and symbols. Where we promised symbols we have offered old-school AI representations composed entirely of, well, more signs. Searle's Chinese Room argument has not been vanquished by a use of terminology that, while useful from a philosophical and design perspective, is

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much more aspirational than it is accomplished. Searle asserts that computationalists can never escape the world of signs, no matter what linguistic contortions they might attempt. Yet a way out of the Chinese room is suggested by a pair of Metaphor Magnet variations that we have discussed here. The first is the use of signs with external reference, such as RGB codes that can be used to create and analyze real images and to mediate between those images and the linguistic processes of metaphor. These codes are signs, yet each has the capacity to be turned into something more, a vivid colour with its own visual and emotional resonances. When a machine builds its metaphors on a foundation of "grounded" signs, they too can evoke the same vividness and resonance as human-crafted metaphors.

We believe the topic-modeling approach behind *@MetaphorMirror* and its timely mapping of metaphors to news headlines has equal promise as a second way out of the Chinese room. Metaphor has always been viewed as a reconciliation of two distinct realms of experience, and when viewed from the perspective of statistical topic-modeling, we can see that those realms differ in more than mere content; they also differ in the number and meaning of the dimensions that structure them. The LDA approach we have presented here takes both of these realms, represented using signs, and maps each into the same mathematical space so that the same dimensions are used to characterize them both. While this third space functions rather like the *blend* space of Fauconnier and Turner's (2002) conceptual blending theory, it is ultimately built from continuous numbers rather than discrete signs, much like the vector-space models of Kintsch (2000). It is capable of subtleties that a traditional AI representation is not. Moreover, if we rebuild the topic model at regular intervals, it can adapt to nuances in the news cycle in ways that only reveal themselves in the shrewdness of its mappings. That these nuances resist explicit codification as a system of discrete signs is precisely the point of Jung's sign vs. symbol distinction.

When *@BuzzFeedNews* tweets the four-word headline "Mood going into 2018" with a link to a skater tumbling on the ice, what are we to make of those four words? Ideally, our computational model should incorporate information from this video too, yet regardless of its content, we can be sure that the word "mood" means much more here than its dictionary entry. Rather, it represents the fractious political and cultural divisions that are so often mentioned in the same context as "the public mood" in news stories. We conclude this chapter then by revealing @MetaphorMirror's implicit sense of this "mood", as encoded in the dimensions of its topic model:

> Enemies nurture hate.
>
> Heroes inspire the love that creates the jealousy that inspires hate.
>
> Who is worse?

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This collection contains a selection of recent work on people's production of figurative language (metaphoric, ironic, metonymic, hyperbolic, ...) and similarly of figurative expression in visual media and artefact design. The articles illuminate issues such as why and under what circumstances people produce figurative expression and how it is moulded by their aims. By focusing on production, the intention is to help stimulate more academic research on it and redress historically lower levels of published work on generation than on understanding of figurative expression. The contributions stretch across various academic disciplines – mainly psychology, cognitive linguistics and applied linguistics, but with a representation also of philosophy and artificial intelligence – and across different types of endeavour – theoretical investigation and model building, experimental studies, and applications focussed work (for instance, figurative expression in product design and online support groups). There is also a wide-ranging introductory chapter that touches on areas outside the scope of the contributed articles and discusses difficult issues such as a complex interplay of production and understanding.

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