On Understanding Grammar

Revised edition

T. Givón

John Benjamins Publishing Company

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The first edition of *Understanding Grammar* was published with Academic Press in 1979.

For Linda

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Foreword to the 1979 edition

The next best thing to being a mother or a midwife is to be the witness to the growth of an infant when later one is asked to foretell its promise. With T. Givón's *On Understanding Grammar* I have been a happy onlooker since chapter 1, and for what my prophetic skills may be worth, I foresee it as one of the truly prizes statements of our current knowledge to appear in this decade. The author has said with his usual modesty that it is a consolidation of viewpoints rather than a promulgation of discoveries. That may be. But in the process of consolidation, it usually turns out that an old light in one field takes on a new brilliance in another. That is one, just one, of the virtues of this book: Well before its conception the author had made his leap away from the tunnel vision of so much of our contemporary formalism. He had explored the tunnel and knew it from end to end; but he has since amassed a knowledge of languages that has few rivals; his familiarity with linguistic history and more than a nodding acquaintance with logic, pragmatics, evolutionary theory and philosophy brings a formidable learning to bear on a discipline whose breadth makes such learning indispensable. The book is rich in insights, even for those who have been with linguistics for a long time. And beginners could be thankful for having it as a starting point, from which so many past mistakes have been shed.

This is a book about understanding that is done with deep understanding – of language and its place in Nature and in the nature of humankind. And with understanding of how these things can be revealed. It is an unpretentious book; the lessons are taught with no display, on the authority of a scholarship that is too thorough to vaunt itself, and with an obvious faith in the power of plain language to describe language. Givón shows us again that great truths are simple truths; and if it is not always a simple matter to arrive at them, that increases our debt to him.

Dwight Bolinger
Palo Alto, California
September 1979

Preface to the 1979 edition

This book is about trying to make sense out of doing linguistics and, ultimately, of human language. Making sense has not been a favorite preoccupation of linguists, the best of whom like to keep their nose close to the grindstone of facts. I respect such integrity, and hope to show that an occasional widening of the horizons will not be detrimental to it.

It took me a while to realize that this book could have some overall coherence: It took writing the entire book to find out whether such coherence was even remotely possible. The enterprise began with Sandy Thompson suggesting that maybe it was time to gather in one place all the disparate themes I have been pursuing over ten years. My editor Harry Whitaker then further encouraged me, after a long talk in the summer of 1976, to publish the book under his Neurolinguistics label at Academic Press. I was a bit dubious; I knew the themes themselves had, each, their internal coherence – the method, discourse-pragmatics, diachrony, typology, pidgins and creoles, language evolution and ontology. They all had a bearing on why and how one would want to do linguistics. But it was still unclear how they would all coalesce. The field has become increasingly fragmented; there was no integrating precedence; subject areas were locked in their separate boxes; human language had persisted in defying facile inductive or deductive methodologies.

The coherence structure of this book resembles a circle: Language sits at the unmarked center, defiant and wide open. The various chapters – topics – straddle the rim, focusing upon the elusive center from multiple perspectives. The inter-dependencies among the various perspectives makes for the coherence structure of the book; and if and when we should know those inter-dependency more precisely, they will, one hopes, make the coherence structure of linguistics.

Chapter 1 is about the method, thus about the notions of 'facts', 'theory' and 'explanation' and their mutual dependence, particularly how those notions manifest themselves in the mundane practice of science.

Chapter 2 is about re-defining syntax in terms of its communicative – semantic and discourse-pragmatic – functions, thus about the relation between the formal properties of syntactic construction and their semantic and pragmatic functions.

Chapter 3 is about the discourse-pragmatic function of negative speech acts and how it transcends the traditional propositional-logical analysis, thus a demonstration of the balance between propositional semantics and discourse pragmatics.

Chapter 4 is about nominal case-marking systems and the balance between event-scope semantic roles and discourse-scope topicality and reference; then how the formal properties of case-marking system and their syntactic typology arise out of that balance, in both synchrony and diachrony.

Chapter 5 is about grammar as a discourse-processing device, and the balance between grammatical and pre-grammatical communication. The perspective is developmental – diachronic, ontogenetic, evolutionary – how grammar emerges out of pre-grammar.

Chapter 6 is about how grammaticalization, initially motivated by adaptive-communicative considerations, can in its later stages make grammar increasingly convoluted, opaque, and maladaptive.

Chapter 7 is about the relation between human language as we currently know it and its protracted evolution, embedding the discussion in the context of evolutionary theory in biology and cultural anthropology.

Chapter 8 is about language and ontology, thus about the relation between the cognizing organism and the universe it inhabits – and tries to make sense of and communicate about.

I do not claim to have resolved everything in this book. Language is a vast phenomenon; to know all about it is to know all about humanity, its socio-culture and the universe it inhabits – the presumably objective universe as well as the universe accessible to the human mind. Such an investigation is in principle hopeless (re. e.g. Kant, Russell, Goedel, Heissenberg). Language is that giant rock we all tunnel into from diverse points of departure, our disparate disciplinary perspectives. We work in our dark corners, hoping to meet some day in the illuminated middle. All I have tried to do here is illuminate my admittedly-narrow span of the tunnel.

What I know about language owes much to many people, both naive speakers and learned teachers. I have tried to acknowledge my many debts at appropriate points throughout the book. There are four people in particular that I have always considered beacons of integrity and common sense in linguistics, a field rife with fads, factionalism and fratricide: Dwight Bolinger, for teaching us that language is best understood in the context of communication; Joseph Greenberg, for refusing to consider the universals of Language without consulting the incredible diversity of languages; Winfred Lehmann, for insisting that

synchrony can only be explained in the context of diachrony; and Kenneth Pike, for suggesting that our understanding of language must be ultimately embedded in the cross-disciplinary context of culture, cognition and human-kind's construction of its universe.

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Cat Creek Ranch
Pagosa Junction, Colorado
September 1979

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Preface to the revised edition

The first edition of this book, assembled somewhat chaotically in the late 1970s and published – no-doubt prematurely – in 1979, was produced under a wholly self-imposed time-pressure. Ever since, I have been aware, progressively and often to my great embarrassment, of how tentative, preliminary and ungainly the original book was, especially when people kept citing it and thus, intentionally or not, re-exposing its numerous insufficiencies. In the intervening decades, I have labored to remedy these faults in numerous research projects and publications, and have come to consider the work a youthful promissory note, executed in great innocence of how long it would take to redeem.

In spite of its many faults, the original book nonetheless strove for a coherent view of language, a view that, in retrospect, harkens back to our towering 19th-and early-20th-Century antecedents – F. Bopp, W. von Humboldt, H. Paul, A. Meillet and O. Jespersen. The cumulative thrust of their work situated human language in a complex and unabashedly inter-disciplinary context, where to understand the structural properties of language one had to also account for its cognitive and communicative functions, its protracted diachrony, its ontogeny and phylogeny and, last but not least, the oft-elusive balance between its unimpeachable universality and incredible diversity. To any discerning evolutionary biologist, anthropologist or psychologist, this heady mix should look familiar. But the challenge remains, now as before, how to illuminate, coherently, the complex inter-dependencies between the disparate parts, and in the process show how necessary they all are.

The theoretical approach that animates this work is complex but, at least in principle, coherent. It notes, first, that grammar-coded domains must be functionally defined (chs 2, 3, 4, 5). That is, any mundane grammatical construction – passive, REL-clause or V-complement – is not defined by its structural properties, but rather by its cognitive-communicative function(s). Logically, this turns out to be the direct consequence of cross-language typological diversity; that is, the fact that the very same function is performed in different languages by starkly-different structures. But it is also the direct consequence of the fact that the diverse structures that code the same function cross-linguistically tend to resemble their diachronic source construction. A purely structural definition

of grammar-coded domains would, therefore, be a hopelessly circular enterprise (Givón 1981; 1995; 2001; 2009; 2015a).

Second, this approach notes that cross-language typological diversity is not arbitrary, but is rather severely constrained and highly motivated (chs 1, 4). It is constrained first by the relatively limited number of source constructions that can be recruited to code the same functional domain. And the choice of such constructions turns out to be constrained, primarily, by the functional similarity – or partial functional overlap – between the source and target domains. But the choice is also constrained by universal principles of form-function iconicity (Haiman 1985; Haiman ed. 1985; Givón 1989).

And third, this approach takes it for granted that the diversity of structures that code the same functional domain is the direct consequence of the diversity of diachronic pathways that gave them rise. Synchronic cross-language diversity is thus the direct product of diachronic diversity, in turn thus constrained by the universal principles that govern diachronic change (Traugott and Heine eds, 1991; Hopper and Traugott 1993; Heine and Kuteva 2007; Givón 2009, 2015a). And as noted above, at the very start of the diachronic rise of new grammatical constructions lies the functional similarity, or partial functional overlap, between the source and target domain.

Empirical science is a progressive, cumulative, ever-tentative enterprise, whereby new facts and novel perspectives most often manifest themselves in complex and oft-unpredictable interactions. To paraphrase Karl Popper (1934/1959), the game of science is endless. He who tires, retires, but the game goes on. In a fairly transparent way, the gradual progression of organized science thus recapitulates the gradual growth of human cognition. However mightily we may strive to get it right the first, second or umpteenth time, our results remain tentative and incomplete. While in the past this used to frustrate me to no end, I find it now strangely comforting.

In an interview published in Time magazine ca. 1964, Ingmar Bergman was asked how he viewed his place in movie-making. His answer, as I recall it, was instructive, indeed illuminating: I see myself, he said, as one of the artisans who came to build the great cathedral in Chartres. Each worked for a year, seven years, ten years, on a ledge, a bas relief, a gargoyle, a freeze, a corner. At the end of their self-allotted time, they each packed their tools, climbed off the parapets and went home. Hopefully, as my late friend and mentor Dwight Bolinger most-generously suggested, this book can still stimulate beginners not to give up too early.

The book has been thoroughly revised, corrected and updated. Fortunately, science is a communal enterprise, where it is human to err and just as human to lend a helping hand. The generous help I received over the years from various commentators and friends is acknowledged at the appropriate loci throughout the text. I must still record, however, my special indebtedness to my long-time publishers, John Benjamins of Amsterdam; and most of all to my long-suffering and most-patient editor, Kees Vaes.

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White Cloud Ranch
Ignacio, Colorado
June 2017

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CHAPTER 1

Fact, method and explanation: On the recalcitrant legacy of structuralism

1.1 Orientation[1]

> My view of Physics is that you make discoveries but, in a certain sense, you never really understand them. You learn how to manipulate them, but you never really understand them. Understanding would mean relating them to something else – to something more profound.
>
> <div align="right">I. I. Rabi (1975)</div>

In re-visiting the original chapter 40 years after the facts, I find myself alternately chuckling and cringing. The general sentiment seems sound enough, couched as it was in the *Zeitgeist* of the 1970s. But while the overall theoretical thrust may still ring true, many of the details – as well the historical perspective – are in great need of dusting up. Having elected to substitute a more current overview, the first paragraph of the original still resounds with the youthful enthusiasm of yesteryears and its inevitable corollary, unmitigated *hutzpah*:[2]

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1. The original chapter grew out of a talk given at UC Berkeley in the Fall of 1975. It registered my indebtedness to Dwight Bolinger, Erica García, Derek Bickerton, Robert Kirsner, Wally Chafe and Harry Whitaker for many helpful comments. The current version owes its genesis to a more recent effort (Givón 2016), first presented at the Association of Linguistic Typology's meeting in Albuquerque, N. M., August 2015. Somewhat felicitously, the meeting fell on the 100th anniversary of the publication of Saussure's *Course*. I am indebted to Esa Itkonen and Ekkehard Koenig for helpful comments. The original inspiration is due to Gilbert Lazard's (2012) valiant attempt to explain why we should limit the scope of our investigation of human language to F. de Saussure's 'internal linguistics'.

2. With apology to the less literary-minded reader, what leaps to mind here is Goethe's haunting Dedication to *Faust,* Part I (1808; translation slightly tweaked):

> You come back again, shimmering ghosts,
> Who long ago appeared to eyes near faded,
> Should I attempt this time to hold you fast?
> Will old dreams still thrill a heart so jaded?…

"This chapter is of necessity polemic, a necessity I regret and would like to apologize for. The history of American linguistics over the past 50 years has been awash with acrimonious name-calling, sterile argumentation, and the rhythmic rise and fall of pseudo-theories and trumped-up 'issues' whose relation to the facts of human language is tenuous at best. In the course of this sorry tale, the foundations of linguistics as a would-be empirical discipline have been thoroughly undermined, as an increasingly perverse use of core terms of science, such as 'data', 'proof', 'theory' and 'explanation', have been vacated of all meaning and utility. For a number of years now, I have been convinced that Generative Grammar, the dogma I grew up with in the 1960s – on its proliferous ideological stripes and alphabet-soup monikers – has trapped itself in a labyrinthine prison, out of which no graceful exit seems possible, short of plowing under the entire edifice and starting over again." (1979, p. 1)

1.2 Saussure's firewall

In Ferdinand de Saussure's *Course of General Linguistics* (1915), one finds the following exhortation about what one should and should not consider as part of 'internal linguistics':

"…My definition of language presupposes the exclusion of everything that is outside its organism or system – in a word, of everything known as "external linguistics". But external linguistics deals with many important things – the very ones that we think of when we begin to study speech. First and foremost come all the points where linguistics borders on ethnology, all the relations that link the history of a language and the history of a race or civilization… Second come the relations between linguistics and political history… Here we come to a third point: The relations between language and all sorts of institutions (the church, the school, etc.)… Finally, everything that relates to the geographical spreading of languages and dialects…." (1915, pp. 20–21)

…A shudder grips me, tears fall burning,
Soft glows the heart, once full of zeal,
What I possess appears so far removed now,
What is long gone now seems so real.

Saussure's exclusions made no mention so far of psychology, neurology or biology. And the firewall he was trying to erect around linguistics was already frail. For earlier on in his book Saussure had identified the firewall's arbitrariness, indeed the great confusion arising from the absence of explicit criteria:

> "…the linguistic phenomenon always has two related sides, each deriving its values from the other… Speech always implies both an established system and an evolution… Would we simplify the question by studying the linguistic phenomenon in its earliest stages – if we began, for example, by studying the speech of children? No, for in dealing with speech, it is completely misleading to assume that the problem of early characteristics differs from the problem of permanent characteristics… Everywhere we are confronted with a dilemma: if we fix our attention on only one side of each problem, we run the risk of failing to perceive the dualities… On the other hand, if we study speech from several points of view simultaneously, the object of linguistics appears to us as a confused mass of heterogenous and unrelated things. Either procedure opens the door to several [other] sciences: psychology, anthropology, normative grammar, philology etc., which are distinct from linguistics… As I see it, there is only one solution to all the foregoing difficulties: *from the very outset we must put both feet on the ground of language and use language as the norm of all other manifestations of speech*…" (1915, pp. 8–9)

The last line, italicized in the *Course* itself, is not a reasoned argument but a *credo*, pure and simple.

My own difficulty has never been with structuralism *per se*. All of us who have found good reasons to go beyond Saussure's 'pure linguistics' acknowledge that to transcend mere description, one had better learn first to describe. In principle, all decent functionalists, cognitivists, historical grammarians, child-language scholars, typologists, anthropological linguists, neuro-psycholinguists and evolutionary linguists must be **structuralists plus**. They begin by describing the phenomena and then proceed to ask various *why*, *how*, and *how-come* questions; such as:

- Are there systematic correlations between linguistic structures and their associated cognitive and communicative functions? And if so, what are the general principles – and mechanisms – that shape and constrain such correlations?
- How do synchronic linguistic structures, with their systematic form-function correlations, come into being through diachrony, and what constrains diachrony?

- How do we acquire our first or second language? Why this particular way rather than any other? What socio-cultural, communicative or neuro-psychological factors constrain language acquisition?
- What constrains the scope of cross-language typological diversity? How come constraints on diversity are the way they are? What are the mechanisms that impose such constraints?
- What features of language are shaped by culture, and through what mechanisms?
- What is the relationship between language structure and the mind/brain that processes it?
- Given that human biology, socio-culture and communication are the products of protracted evolution, how did human language evolve?

One could, of course, make *a priori* assertions about the **autonomy** or **encapsulation** of language structure, as both Leonard Bloomfield and Noam Chomsky have done in Saussure's wake. But how could one reject the potential relevance – and constraining power – of related neighboring domains without first investigating them? More to the point perhaps, is description without explanation a serious option in science?

1.3 Structuralism and the philosophy of science

Structuralism in linguistics is not rooted in linguistics itself, but rather in philosophy, beginning with Aristotle's celebrated opening paragraph of *De Interpretatione*:

> "Now spoken sounds [=words] are symbols of affections of the soul [=thoughts], and written marks are symbols of spoken sounds. And just as written marks are not the same for all men [=are language specific], neither are spoken sounds. But what these are in the first place signs of – affections of the soul – are the same for all men [=are universal]; and what these affections are likenesses of – actual things – are also the same for all men…" (Ackrill ed. 1963; bracketed material added)

From Aristotle's **empiricist** perspective, thoughts ('affections of the soul') reflect external reality ('actual things') faithfully and iconically ('are likenesses of'). What is more, this reflecting relation is universal ('the same for all men'). In contrast, linguistic expressions ('words') bear an arbitrary relation to ('are symbols of') thoughts, a relation that is not universal ('not the same for all men').

The arbitrariness – thus autonomy – of language structure posited by Aristotle applied only to the sound-code of the lexicon. In his treatment of

grammar in the *Categorie* and various works on logic (e.g. *Posterior Analytic*), an **isomorphism** – functionally motivated relation – is postulated between grammatical categories and sentences, on the one hand, and logical meaning on the other. In this, Aristotle conformed to Plato's *Cratylus*; and the thread of this functionalist isomorphism runs uninterrupted through the works of the Greek grammarians, the medieval *Modistae* and the Port Royal grammarians, all the way to the end of the 19th Century (Itkonen 2010).

The rise of structuralism in linguistics in the early 20th Century, with its two towering figures, F. de Saussure and L. Bloomfield, owes its intellectual roots in part to Aristotle's fatal opening paragraph of *De Interpretatione*, but in larger measure to a radical brand of empiricism – **Logical Positivism** – that rose at the end of the 19th Century. To the infant disciplines of psychology, anthropology and linguistics, two towering exponents of Logical Positivism, Bertrand Russell and Rudolph Carnap, offered the deceptive analogy of physics, a science to which notions such as purpose, function, adaptive-selection or ontogenesis did not apply.

In tracing the roots of 20th Century structuralism to Positivist philosophy of science, one must recall that its ultimate descent harkens back to Aristotle's **objectivis**t epistemology. This comes out loud and clear in Rudolph Carnap's later reflection on the physicalism of the Vienna Circle:

> "…The thesis of physicalism, as originally accepted in the Vienna Circle, says roughly: Every concept of the language of science can be explicitly defined in terms of observables; therefore every sentence of the language of science is translatable into a sentence concerning observable properties…" (Carnap 1963: 59)

Bertrand Russell's objectivism, couched in more forbidding terms, is evident in his discussion of the relation between particular entities (description) and the universal concepts (theory) to which they give rise:

> "…We may then define a *particular* in our fourth sense as an entity that cannot be in or belong to more than one place at any particular time, and a *universal* as an entity that either cannot be in or belong to any place, or can be in or belong to many places at once… Owing to the admission of universals in our fourth sense, we can make an absolute division between percepts and concepts. The universal whiteness is a *concept*, whereas a particular white patch is a *percept*…. Such *general qualities* as whiteness never exist in time, whereas the things that do exist in time are all particular [percepts]…" (*Relations of universals… particulars*; in Russell 1956: 122; bracketed material added)

The core notion of functionalism, *purpose* or *function*, is an invisible teleological construct that defies translation into Carnap's 'language of science'; as are central psychological concepts vital to understanding language such as *meaning*, *intent*, *message, mind*, *knowledge* or *belief*. The critical element that makes something a biological code, or in C. S. Peirce's (1934, 1940) words "something by knowing of which one knows something more", is the signal's association with some purpose, function or intended message. This is where the world of living organisms stands in stark contrast to the pre-biological universe of physics and chemistry – in which teleological notions are senseless except perhaps in reference to the Divine (see quote from I. I. Rabi, above).

Description without explanation amounts to facts without a theory; for at the very heart of science lie the theory-dependence of facts and the explanatory imperative of theories. This is seen more clearly in post-Peircean pragmatic philosophy of science, beginning with Kuhn's reminder that the investigative cycle of science begins with a discrepancy between novel facts and current theory:

> "…Discovery commences with the awareness of anomaly, i.e. with the recognition that nature has somehow violated the paradigm-induced expectations that govern normal science…" (Kuhn, 1962: 52–53)

We owe Hanson (1958) the comprehensive elaboration of the process of science, integrating Carnap's inductivism, Popper's (1934/1959) deductivism, and Peirce's (1934, 1940) pragmatism. Put together:[3]

(1)   **Science as a multi-method process:**
      Abductive phase
      a.   Puzzling facts F are incompatible with current theory T.
      b.   Facts F are, however, totally compatible with new hypothesis H.
      c.   If hypothesis H were true, facts F would find their natural explanation in it.
      d.   Therefore, by abduction, hypothesis H must be the case.
      Deductive phase:
      e.   Derive a sufficient number of the logical implications LI of hypothesis H.

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3.   For further detail see Givón (2005, ch. 7).

Inductive phase:

f.   Construct experimental or population-statistics tests of the logical implications LI of H.
g.   Gather the facts concerning those logical implications. Do the facts uphold or falsify logical implications LI of hypothesis H?

Deductive phase:

h.   If you **failed to falsify** logical implications LI, hypothesis H survives – till some future test may falsify some of its logical implications, or till new facts are discovered that are incompatible with it.
i.   In the interim, hypothesis H prevails.

Two important points emerge from Hanson's integrated description:

- Facts (descriptions) are not independent of theory, but rather are themselves **theoretical constructs** that interact with the theory.
- The process of hypothesis formation (abduction) is indispensable to science, and to **theoretical explanation**.

1.4   **The three dogmas of structuralism**

1.4.1   **Arbitrariness**

As noted above, Aristotle's doctrine of arbitrariness of the linguistic sign – thus arbitrariness of cross-language diversity – pertained only to the semiotic relation between concepts (words) and sounds (or letters). Latter-day structuralists, with Saussure as their reigning authority, unreflectively extended this doctrine to grammar. But Saussure's doctrine, without citing Aristotle, is still anchored in the arbitrariness of lexical phonology:

> "…The bond between the signifier and the signified is arbitrary… *the linguistic sign is arbitrary*. The idea of "sister" is not linked by any inner relationship to the succession of sound *s-ö-r* which serves as its signified in French… the signified "ox" has as its signifier *b-ö-f* on one side of the border and *o-k-s* (*Ochs*) on the other…" (1915, pp. 67–68)

Aside from a perfunctory nod to the quaint iconicity of onomatopoeia and interjections, this is the entire argument for arbitrariness in the *Course*. As if grammar had never existed.

1.4.2   **Idealization: *Langue* vs. *parole***

In line with a long Platonic tradition, which Saussure again does not acknowledge, he laid down his second firewall between the underlying abstract system – *langue* – and the manifest behavior – *parole*.[4]

> "…Execution is always individual… I shall call the executive side *speaking* [*parole*]… If we could embrace the sum of word-images stored in the minds of all individuals, we could identify the social bond that constitutes language. It is a storehouse filled by the members of a given community through their active use of speaking, a grammatical entity that has potential existence in each brain, or, more specifically, in the brains of a group of individuals. For language is not complete in any speaker; it exists perfectly only within a collectivity… In separating language [*langue*] from speaking [*parole*] we are at the same time separating: (1) what is social from what is individual; and (2) what is *essential* from what is *accessory* and more or less *accidental*… Language, unlike speaking, is something that we can study separately… Whereas speech is heterogenous, language, as defined, is homogenous…" (1915, pp. 13–15; bracketed material and boldfacing added)

The metaphysical muddle and tortuous reasoning of this passage is reminiscent of Medieval scholasticism.

1.4.3   **Segregation: Synchrony vs. diachrony**

Saussure's third firewall, just as essential to the Platonic enterprise, is the doctrine of segregation, this time between synchrony, the product, and diachrony, the process that gave rise to it. To wit:

> "…Very few linguists suspect that the intervention of the factor of time creates difficulties peculiar to linguistics and opens their science to completely divergent paths… political economy and economic history constitute clearly separate disciplines within a single science… A similar necessity obliges us to divide linguistics into two parts, each with its own principles… distinctions should be made, according to the

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4.   Saussure's idealized *langue* harkens back to Plato's *eidon* ('essence'; see Bostock 1994; Williams 1994).

following illustration, between (1) the *axis of similarities* (AB), which stands for the relations of coexisting things, and from which the intervention of time is excluded; and (2) the *axis of successions* (CD), on which only one thing can be considered at a time but upon which are located all things on the first axis together with their changes… The multiplicity of signs, which we have already used to explain the continuity of language, makes it **absolutely impossible** to study simultaneously relations in time and relations within the system…" (1915, pp. 79–81; boldfacing added)

The hedging, indeed the inevitable fudging, come only later, well dispersed among the dogmatic certainties. To wit:

"…In practice, a language-state is not a point but rather a certain span of time during which the sum of the modifications that have supervened is minimal… Of two languages that exist side by side during a given period, one may evolve drastically and the other practically not at all; study would have to be diachronic in the former instance and synchronic in the latter. And absolute state is defined by the absence of changes, and since language changes somewhat in spite of everything, studying a language-state means in practice **disregarding changes of little importance**, just as mathematicians disregard infinitesimal quantities in certain calculations, such as logarithms… In static linguistics, as in most sciences, no course of reasoning is possible without the usual **simplification of data**…" (1915, pp. 101–102; boldfacing added)

But by what criteria does one distinguish between 'changes of little importance' that can be safely disregarded and more important changes?

It is worth noting that Saussure's two idealizations, *langue ex parole* and synchrony ex diachrony, are hopelessly intertwined, being the siamese twins of the same Platonic philosophical impulse. It is only by relegating synchronic variation to the lowly realm of *parole* that one could ignore the crucial role that variation plays in the very mechanism of diachronic change. For, as Bill Labov has taught us, change and variation march hand in hand. They do so in biological evolution as in language acquisition and diachrony. What the strict segregation between synchrony and diachrony also tends to ignore are the footprints – frozen relics – of diachrony strewn all over synchrony.

1.5 **Latter-day structuralism**

The dogma of arbitrariness sold us on the illusion that cross-language typological variation was capricious, arbitrary and unconstrained. Saussure's Platonic idealization brought us Chomsky's (1965) *competence* and the rejection of natural data of language use, behavior and processing. And the segregation of synchrony from diachrony made us ignore the central role diachrony plays in producing and explaining synchrony.

Like Saussure, Leonard Bloomfield, the father of American structuralism, owed his conception of meaning to the Positivists – via of Behaviorist psychology:[5]

> "…We must study people's habits of language – the way they talk – without bothering about mental processes that we may conceive to underlie or accompany habits. We must dodge the issue by a fundamental assumption, leaving it to a separate investigation, in which our results will figure as data along the results of other social sciences…" (Bloomfield 1922: 142)

And likewise:

> "…In order to give a scientifically accurate definition of meaning for every form of the language, one should have to have scientifically accurate knowledge of everything in the speaker's world… In practice, we define the meaning of a linguistic form, whenever we can, in terms of some other science…" (Bloomfield 1933: 139–140)

In the same vein, Bloomfield's rejection of universals and theory harkens back to Aristotle's and Saussure's doctrine of arbitrariness:

> "…North of Mexico alone there are dozens of totally unrelated groups of languages, presenting the most varied types of structures. In the stress of recording utterly strange forms of speech, one soon learns that philosophical presuppositions were only a hindrance… The only useful generalizations about language are inductive generalizations…." (1933: 19–20)

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5. Bloomfield got his behaviorism from his Chicago colleague Weiss, thus indirectly from Watson. He and his structuralist followers never adopted Saussure's Platonic idealization, an anathema to empiricists.

I see no discernible reason why one should re-adopt Saussure's and Bloomfield's strictures. Lack of scientific curiosity and disinterest in explanation are not, as far as I can determine, much of an argument.

1.6 Explanatory biology: Aristotle revisited[6]

It is not an accident that structuralists like Saussure, Bloomfield and Chomsky have found their affinity to science in physics, the paradigm science of the Positivists. But in fact, biology is a much better scientific model for linguistics. First, because the explanatory notions of **function** and **adaptive selection** have been embedded in it ever since Aristotle's *De Partibus Animalium*. And second, because ever since Aristotle's *De Generationem Animalium*, biology has been an unabashedly **developmental** discipline.

It is an ironic fluke of history that the father of structuralism in linguistics turns out to have been the progenitor of functionalism in biology. Two structuralist schools dominated Greek biological thought prior to Aristotle, both seeking to understand living organisms like inorganic matter. Empedocles proposed to explain organisms by their **component elements** (chemistry), while Democritus opted for understanding organisms through their **component parts** – their structure.

In *De Partibus Animalium*, Aristotle first argued against Empedocles' elemental approach, pointing out the relevance of histological and anatomical macro-structure:

> "…But if men and animals are natural phenomena, then natural philosophers must take into consideration not merely the ultimate substances of which they are made, but also flesh, bone, blood and all the other homogeneous parts; not only these but also the heterogeneous parts, such as face, hand, foot…" (McKeon ed. 1941: 647)

Aristotle next noted the inadequacy of Democritus' structuralism:

> "…Does, then, configuration and color constitute the essence of the various animals and their several parts?… No hand of bronze or wood or stone constituted in any but the appropriate way can possibly be a hand in more than a name. For like a physician in a painting, or like a flute in a sculpture, it will be unable to do the *office* [= function] which that name implies…" (*ibid.*:647; italics and bracketed material added)

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6. A related discussion of the intellectual roots of functionalism in linguistics and their connectivity to biology may be found in Givón (2015a, ch. 30).

Next, Aristotle offered his functionalist touchstone – the teleological inter-pretation of living organisms, using the analogy of man-made artifacts:

> "…What, however, I would ask, are the forces by which the hand or the body was fashioned into its shape? The woodcarver will perhaps say, by the axe and auger; the physiologist, by air and earth. Of these two answers, the artificer's is the better, but it is nevertheless insufficient. For it is not enough for him to say that by the stroke of his tool this part was formed into a concavity, that into a flat surface; but he must state the *reasons* why he struck his blow in such a way as to affect this, and what his final *object* [= purpose] was…" (*ibid.*:647–648; italics and bracketed material added)

Finally, Aristotle outlined the governing principle of functionalism, the isomorphic mapping between form and function:

> "…if a piece of wood is to be split with an axe, the axe must of necessity be hard; and, if hard, it must of necessity be made of bronze or iron. Now exactly in the same way the body, which like the axe is an *instrument* – for both the body as a whole and its several parts individually have defi-nite operations for which they are made; just in the same way, I say, the body if it is to do its *work* [= function], must of necessity be of such and such character…" (*ibid.*:650; italics and bracketed material added)

Ever since Aristotle, structuralism – the idea that structure is autonomous, arbitrary and requires no 'external' explanation; or worse, that structure some-how explains itself – has been a dead issue in biology, a discipline where com-mon-sense functionalism is taken for granted like mother's milk. Thus, from a contemporary introductory anatomy text:

> "…anatomy is the science that deals with the structure of the body… physiology is defined as the science of function. Anatomy and phys-iology have more meaning when studied together…" (Crouch 1978, pp. 9–10)

Pre-Darwinian biology amassed three separate descriptive data-bases:

- The Aristotle-initiated descriptive taxonomy (typology) of living beings, scaled from the simplest to the most complex (*scala naturae*).
- The Aristotle-initiated understanding of anatomy-physiology (form-function) correlations.
- The stratified fossil record of geology.

Darwin (1859) integrated these three descriptive data-bases into an explanatory theoretical framework – evolution through adaptive selection. Two additional data-bases were integrated later on into the Neo-Darwinian theory of evolution:

- Molecular genetics (see e.g. Futuyma 1986)
- Developmental biology (see e.g. West-Eberhard 2004)

The latter is particularly important because it suggests an overlap, not only analogical but also homological, with language diachrony, the culturally-transmitted developmental trend that, we used to think, had no precedent in biology.[7]

The source of variation in biological populations is both genetic (genotypic) and non-genetic (phenotypic, epigenetic, behavioral). While both can be adaptive, it was earlier assumed that only genetic variation had direct evolutionary consequences. However, the adaptive interaction of genes with the environment – natural selection – is mediated by the *phenotype*'s structural and behavioral traits, which are only partially controlled by genes. As a result, non-genetic variation does partake in the actual mechanism of adaptive selection. Put another way, synchronic variation in behavior – the adaptive lifetime experimentation of individuals – contributes, in a fashion reminiscent of Lamarck, to the eventual direction of evolution. Or, as Ernst Mayr puts it:

> "…Many if not most acquisitions of new structures in the course of evolution can be ascribed to selection forces exerted by **newly-acquired behaviors** (Mayr 1960). Behavior, thus, plays an important role as the **pacemaker of evolutionary change**. Most adaptive radiations were apparently caused by behavioral shifts…" (Mayr 1982: 612; boldfacing added)

In the same vein, Fernald and White (2000) observe:

> "…Behavior can and does influence specific aspects of brain structure and function over *three different time frames*. A causal link is easy to establish on an *evolutionary time scale* because selective forces of the ecological niche of the animal typically are reflected in the body shape, sensory and motor systems, and behavior. Similarly, on a *developmental*

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7.   For further discussion of the role of everyday adaptive behavior in language diachrony and biological evolution see Givón (2009).

time scale, behavior acts in concert with the environment to establish structural changes in the brain that influence an organism throughout its lifetime. Surprisingly, there currently is evidence that in *real time, social behavior* also causes changes in the brain in adult animals…" (Fernald and White 2000, p. 1193; italics added)

1.7   **Synchrony as diachrony**[8]

While this section focuses, primarily, on debunking Saussure's dogma of **segregation** of synchrony from diachrony, it is also serves to debunk the **arbitrariness** doctrine – in two distinct ways. First, by demonstrating that in order do a typology of grammar-coded domains, one has to first define those domains functionally; so that defining them by structure alone yields nonsensical results.[9] And second, by reminding us that the diachronic extension from one morphosyntactic domain to another – the core process of grammaticalization – involves, as its first step, the perception of **functional similarity** between the source and target domain.

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8.   This section is a compression of Givón (2015a, ch. 17). An early version was presented at the *Joseph Greenberg Memorial Symposium* at Stanford University in 1998, and another version at the *Second Workshop on Passives and Grammatical Relations* at the University of Sonora, Hermosillo in 2004. A revised version was presented at a *Conference on Diachronic Syntax* at Osaka University in 2007, and eventually mutated into Givón (2009, ch. 3). The general thrust of the argument converges with Greenberg's (1969, 1978, 1979) view of the relationship between diachrony and synchronic typology. This observation, however, only makes sense in the context of a functional definition of grammar-coded domains (Givón 1981a). I am indebted to Bernard Comrie, Bernd Heine, Matt Shibatani and Werner Abraham for helpful comments on earlier versions of the work.

9.   Comrie (2004/2008) suggests that the passive domain can be defined by purely structural means as, roughly, "that construction that, like Latin or English, promotes the object of the active clause into subject and demotes the agent into oblique role". This rules out most clause-types that function as passives in the world's languages.

1.7.1   Example: The diachronic typology of passive constructions

One can define the functional domain of the passive as:[10]

(2)   **Functional definition of the passive domain:**
       "A passive clause is one where the agent of the corresponding active is radically de-topicalized, and another argument becomes, by default, the topical argument".

If one subscribes to this definition, then a theoretically revealing cross-linguistic typology of passive clauses should be, ideally, the cross-linguistic list of structures – clause-types – that code this functionally-defined domain. For the purpose of the discussion here, I will consider the following six major types. These types are diachronically young enough so that their diachronic source is still transparent, as is the functional overlap between the source and target constructions.[11]

(A)   **The adjectival-stative passive**
       In some languages, as in the English BE-passive, a passive clause arises diachronically from, and still resembles structurally, a predicate-adjective construction, as in:

(3)   a. **Predicate-adjective**: It is big
       b. **Adjectival-stative**: It is broken
       c. **Perfect-resultative**: It has been broken
       d. **Passive**: It was broken (by someone)

(B)   **The reflexive passive**
       In some languages, as in e.g. the English GET-passive (Yang and Givón 1994), a passive clause arises diachronically from, and still resembles structurally, a reflexive middle-voice construction, as in:

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10. See Givón (1981a), Shibatani (1988), Givón (ed. 1994).

11. Many other types can be found in Haspelmath (1990). The question of what constitutes a 'major' type is not uncontroversial, not only here but in taxonomy in general. As Aristotle noted long ago (*Metaphysics*), and as Ernst Mayr reaffirmed more recently, all taxonomies of natural phenomena are logically arbitrary but pragmatically motivated, depending on the purpose – perspective – of the taxonomist (Givón 2005, ch. 1).

(4) a. **Causative**:
        Mary got them to fire John
     b. **Causative with passive complement**:
        Mary got John (to be) fired
     c. **Reflexive-causative (passive complement)**:
        Mary got herself fired
     d. **GET-passive**:
        Mary got fired

(C) **The serial-verb adversive passives**

In some languages, the passive clause arises diachronically from, and still resembles structurally, an adversive serial-verb construction. In the process of grammaticalization, an adversive serial verb such as 'suffer' first becomes the grammaticalized marker of an adversive passive, as in Mandarin Chinese, Japanese, Thai or Vietnamese. Such a construction may later expand its functional scope to become a generalized passive, as in Mandarin (Li and Thompson 1981; tones left unmarked):

(5) a. **Adversive passive (older)**:
        ta   **bei**   (gongsi)   chezi-le
        s/he **suffer** (company) fire-PERF
        'S/he was fired (by the company)'
        (lit.: 'S/he suffered (when) the company fired her')
     b. **Generalized passive (newer)**:
        sheng-cheng   **bei**   jiefang-le
        province-capital **PASS** liberate-PERF
        'the provincial capital was liberated'
        (lit.: 'the provincial capital suffered (when someone) liberated it')

(D) **The VP-nominalization passive**

In some languages, such as Ute, a passive clause may arise diachronically from, and still resembles structurally, a nominalized verb phrase construction, as in Ute (Givón 2011):[12]

(6) a. **Verb-phrase nominalization**:
        múusa-paqhá-**ta** ka-'áy-wa-tu̠   'ura-'ay
        cat-kill-**NOM**   NEG-good-NEG-NOM be-IMM
        'Cat-killing is not good'

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12. A similar development of a nominalized clause into a non-promotional passive may be seen in modern Dutch (Kirsner 1976), arising from an existential-presentative construction.

b. **Passive**:
    múusachi paqhá-**ta**-pʉga
    cat/O   kill-**PASS**-REM
    'The cat was killed', 'someone killed the cat'

(E) **The Left-dislocation-cum-impersonal-subject passive:**
In some languages, such as Kimbundu, a passive construction may arise diachronically from, and still resembles structurally, a blend of L-dislocation with the impersonal subject construction using the pronoun 'they', as in (Charles Uwimana, i.p.c.):[13]

(7) a. **L-dislocation with full-NP subject**:
         Nzua, aana   **a-mu**-mono
         John   children **they-him**-saw
         'John, the children saw him'
     b. **L-dislocation with pronominal subject**:
         Nzua, **a-mu**-mono
         John   **they-him**-saw
         i.   **Anaphoric active**: 'John, they saw him'
         ii. **Impersonal passive**: 'John, he was seen'
     c. **Impersonal passive**:
         Nzua **a-mu**-mono   (kwa meme)
         John **they-him**-saw   by   me
         'John was seen (by me)'
         (lit.: 'John, they saw him by me')

(F) **The zero-anaphora passive**
Lastly, in many languages the passive clause arises from, and still structurally resembles, the active clause with a highly-topical, referring, anaphoric agent; that is, from a clause with a *zero anaphoric* agent. Thus in Sherpa (Koncchok Lama, i.p.c.):

(8) a. **Non-anaphoric agent of active**:
         ti   mi-ti-gi   chenyi   chaq-sung
         DEF man-DEF-ERG cup/ABS break-PA/EV
         'The man broke the cup'

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13. For a more extended study of a similar construction in a closely-related Bantu language, see Kawasha (1999), Givón and Kawasha (2001), Givón (2015a, ch. 14).

b. **Zero agent**:
    chenyi   chaq-sung
    cup/ABS   break-PA/EV
    i. **Active interpretation**: 'S/he broke the cup'
    ii. **Passive interpretation**: 'The cup was broken', 'Someone broke
    the cup'

What gave rise to this typological diversity of passive constructions is the fact that each passive type A through F arose diachronically from a different source construction. But this is only possible because such source constructions shared some functional features with the passive functional domain. In other words, those source constructions exhibit **functional similarity**, or **partial functional overlap**, with the target passive functional domain (see (2) above). This functional similarity is summarized as follows for our six passive types:

Type A

The adjectival-resultative construction in English, like a typical passive, is agentless, and its subject is thus, by default, a topical patient.

Type B

The GET-causative-reflexive in English, much like the passive, has a non-distinct agent-patient single argument that is, by default, also its topical patient.

Type C

The Mandarin adversive serial-verb clause has a topicalized patient and, most commonly, also a de-topicalized or missing agent.

Type D

The Ute VP nominalization, like a typical passive, is agentless/subjectless and thus, by default, topicalizes the surviving non-agent argument.

Type E

The Kimbundu L-dislocation clause, much like the passive, has a topicalized patient; and the impersonal 'they' construction has a de-topicalized non-referring agent.

Type F

Somewhat more difficult to press into this explanatory mold is the zero-agent passive of Sherpa. This is because the anaphoric zero agent of its active

source construction is highly referring and topical, while the zero agent of the structurally-identical passive is neither referring nor topical. One may as well note, however, that the very same is also true of a well-known type of *antipassive*, where a zero-coded object may be either the anaphoric topical patient of the active, or a non-referring, non-topical patient of the antipassive. For both the passive and antipassive, thus, there is a functional overlap between the two seemingly-disparate uses of zero arguments: (a) to code predictable, highly accessible information; and (b) to code unimportant or irrelevant information (Givón ed. 1983; 1988; 2017).

Functional similarity, or partial functional overlap, is a crucial pre-condition for the diachronic extension from a source domain to a target domain. And it is the functional definition of *both* domains that makes grammaticalization pathways as predictable as they often are.

In the early stage of grammaticalization, the same structure performs two similar but non-identical functions, the old and the new. In this, diachronic change in language closely resembles biological evolution, where the early-stage of functional re-analysis of organs is considered a major component of the evolutionary mechanism. In this connection, Ernst Mayr cites no less an authority than Darwin:

> "…By far the most important principle in the interpretation of the origin of new structures is that of the "change of function"… Darwin recognized quite clearly that the possibility for a change of function usually depends on two prerequisites. The first of these is that a structure or an organ can *simultaneously perform two functions*: "Numerous cases could be given amongst the lower animals of the same organ performing at the same time wholly distinct functions"… The other is the principle of *duplication*: "Again, two distinct organs, or the same organ under two different forms, may simultaneously perform in the same individual the same function, and this is an extremely important means of transition"…" (Mayr 1976, pp. 97–98; italics added)

1.7.2 The diachronic provenance of synchronic structural properties

As noted above, the early stages of grammaticalization are characterized by *functional ambiguity*. This is so because functional re-analysis is the first step in diachronic change, be it syntactic or lexical. Functional re-analysis takes place instantaneously, as a spontaneous adaptive experimentation by

individual speakers during communication, when speakers extend the use of old constructions (and words) to novel contexts. Structural re-adjustment, re-analysis and simplification eventually follow, giving rise to more precise ('iconic') coding of the newer vs. older functions as two distinct constructions. Such re-analysis often occurs later in the diachronic cycle, and is subject to different constraints (Givón 1971, 1975a, 2015a; Heine *et al.* 1991; Traugott and Heine *eds* 1991; Hopper and Traugott 1993; Bybee *et al.* 1994; Heine and Kuteva 2007; *inter alia*).

The six passive constructions discussed above are diachronically relatively young.[14] In five out of the six types, the very same construction still performs both its pre-passive (source) and passive (target) function, with some optional elements added or subtracted. And it is often the surrounding context, marked below in parentheses, that facilitates change from the old to the new functional interpretation. Thus, respectively:

(9) **English adjectival passive (A):**
   a. **Resultative-adjectival**:
      (When we looked last night) the window was (already) broken.
   b. **Passive**:
      The window was broken (by a burglar late last night).

(10) **English GET-passive (B):**
   a. **Reflexive**:
      (She didn't like Phoenix, so) she got herself transferred to Atlanta.
   b. **Adversive-passive**:
      She got transferred (by her boss)

(11) **Ute VP-nominalization passive (D):**
   a. **Nominalization**:
      múusachi paqxa-ta-'u ka-'ay-wa-tʉ   'ura-pʉga
      cat/O   kill-NOM-3s NEG-good-NEG-NOM be-REM
      '(His/her) killing (of) the cat (was bad)'
   b. **Passive**:
      múusachi paqxa-ta-pʉgay-'u (kú-aw)
      cat/O   kill-PASS-REM-3s/O (yesterday)
      'The cat was killed (yesterday)'

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14. 'Diachronically young' is, of course, a matter of degree, and could amount to centuries. Thus, the English *BE*-passive is ca. 500 years old, and the *GET*-passive at least 200 years old (Yang and Givón 1994). Syntactically, both still closely resemble their respective source constructions.

(12) **Kimbundu L-dislocation/impersonal passive (E):**
   a. **Active, anaphoric agent**:
      Nzua, (aana) **a-mu**-mono
      John (children) **3p-him**-saw
      'As for John, the children saw him'
   b. **Passive, impersonal agent**:
      Nzua **a-mu**-mona (kwa-meme)
      John **3p-him**-saw by-1s
      'John was seen (by me)'

(13) **Sherpa zero-anaphora passive (F):**
   a. **Active, anaphoric agent**:
      chenyi chaqx-sung (, ti miti-gi)
      cup/ABS break-PA/EV DEF-man-ERG
      'he broke the cup (, the man did)'
   b. **Passive, impersonal agent**:
      chenyi chaqx-sung
      cup break-PA/EV
      'The cup was broken'

The lone exception here is the serial-verb passive of Mandarin Chinese (type C; see (5) above). The initial functional ambiguity here was between a clause-chain (source) and a single event (goal) interpretation. The diachronic change involved here is a type of *clause union,* whereby the two erstwhile-chained event clauses are re-interpreted as a single event serial-verb clause. The earliest re-structuring step here is intonational, the subtle but ubiquitous merger of two intonation contours into one (see Mithun 2006, 2007a, 2007b, 2009; Givón 2015a, chs 23, 25).

1.7.3 Grammatical relations in the passive clause

Let us turn now to the structural aspects of the diachronic rise of passive constructions, focusing on the relational properties (GRs) in the various passive clause-types A-F above. We have already noted that while their synchronic functions as passives are similar, those diverse structures reflect – especially when they are diachronically young – the structural features of their respective source constructions. This is a direct consequence of the fact that diachronic change, much like biological evolution, begins with functional re-analysis, and that structural re-adjustment invariably lags behind.

The most general structural-typological feature of passive clauses is the distinction between **promotional vs. non-promotional passives**. That is,

whether the non-agent topic of the passive clause is or is not its *grammatical subject*.[15] But this feature is entirely predictable from the relational properties of the source construction: The passive types A, B, C above are all *promotional* because their topic/patient was already the **grammatical subject** in the respective source construction. Types D, E, F are all *non-promotional* because their topic/patient was coded as the **grammatical object** in the respective source construction. Structural re-analysis has not yet tampered with this feature of these relatively-young passives. Their grammatical relations are still marked as they were in the source construction.

The fact that the relational properties of passive constructions, at least at the early stages of grammaticalization, reflect faithfully the relational properties of their source constructions is as vivid a demonstration as one could offer of why a purely structural definition of the passive – and indeed of all syntactic constructions – *a la* Comrie (2004/2008) is untenable. For it would lead us to consider only the three promotional passives among the six types discussed above as 'true passives', the other three as 'not really passives'. Thus, for example, Ute used to have 'a true passive' marked by the suffix *-ka*, till it lost it, and then renovated it with the current *-ta*-marked 'false-passive'. What is more, since the other structural properties of our six passive types also reflect those of their source constructions, classifying the six constructions by structural similarity would mean that each one of them is more similar to its source constructions than to 'a real passive'. Defining grammar-coded domains by purely structural means is clearly a nonsensical enterprise.

1.8 Closure

Ever since Aristotle, biology has been a prime example of how structural description and theoretical explanation march hand in hand and stimulate each other's growth. Till the advent of Logical Positivism in the late 19th Century, linguists had practiced a recognizable brand of Platonic-Aristotelian functionalism (Itkonen 2010). It would be a bloomin' shame if linguists in the 21st Century – for lack of curiosity or disinterest in explanation – did not follow our sensible forebears. Gilbert Lazard is not alone in his nostalgia for 'internal linguistics'. A similar perspective has been advanced, as just as thinly disguised

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15. See Keenan's (1975, 1976a) seminal work on grammatical relations, as well as further elaboration in Givón (ed. 1997a).

a *credo*, by Martin Haspelmath (2007, 2010). The seductive siren song of structuralism has yet to give up the ghost.

Functionalism in linguistics has always been an attempt to understand language facts in an explanatory – theoretical – framework. Towering antecedents like F. Bopp (1816), W. von Humboldt (1836), H. Paul (1890), O. Jespersen (1921, 1924), E. Sapir (1921), G. Zipf (1935) and D. Bolinger (1977), to mention but a few, have made it clear that description and explanation march hand in hand. If we are ever to understand human language in its multiple complex connectivity, a retreat to Saussure's dogmas, Bloomfield's Empiricism or Chomsky's abstract Platonism is not likely to get us there.

Lastly, the implications of our discussion of the typology of passive constructions may be summarized as follows:

- The synchronic typology of any grammar-coded domain is nothing but the enumeration of the **various structural means** by which one reaches the **same functional ends**.
- But such a synchronic typology merely enumerates the end-points of the various **diachronic pathways** that gave rise to those variant synchronic structures.

Saussure's dogmas of arbitrariness ('structure divorced from function') and segregation ('synchrony detached from diachrony'), taken together, are anathema to a serious understanding of cross-language typological diversity, and – Joe Greenberg's dream – to understanding how such diversity is both licensed and constrained by language universals.

As a final reminder of the youthful exuberance that permeated the original chapter, its closing paragraph may still ring a bell:

> "…Traditionally, empiricists have been known for their love affair with the data and meticulousness in obtaining and sifting through it, while remaining indifferent to theory and explanation. Rationalists, on the other hand, have been noted for their bold theoretical constructs, often remaining downright sloppy in their approach to gathering and analyzing data. Thus, Skinner's 'stimulus-response' is just as theoretically vacuous as Descartes' 'animals-as-automata' is empirically irresponsible. The curious thing about Generative Grammar is that it has somehow managed to combine the worst methodological features of our two grand epistemological traditions – the theoretical vacuity of empiricism and the empirical laxness of rationalism." (1979, p. 44)

Abbreviations of grammatical terms

1s	1st person singular	NEG	negative
3s	3rd person singular	NOM	nominative
3p	3rd person plural	O	object
ABS	absolutive	PA	past
ERG	ergative	PASS	passive
EV	evidential	PERF	perfect
DAL	dative	PFV	perfective
DEF	definite	RECIP	reciprocal
FUT	future	REFL	reflexive
IMM	immediate	REM	remote
INSTR	instrumental		

Toward a discourse definition of syntax: The communicative correlates of grammar

2.1 Antecedence[1]

In the preceding chapter I tried to trace the descent of the functional-adaptive approach to language through the works of philosophers, biologists, psychologists and anthropologists. A somewhat narrower perspective may trace the antecedence of functionalism in grammar to the work of illustrious antecedents in linguistics, beginning with Wilhelm von Humboldt:

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1. The original version of this chapter was a somewhat brash promissary note that required, subsequently, forty years of research before enough of the details fell into place and some the misunderstandings cleared out. It purported, valiantly, to demonstrate the communicative correlates of grammar, conflating a number of distinct functional domains: (i) presupposition, (ii) topicality, (iii) definiteness, (iv) voice, (v) subordination. While often interacting, these grammar-coded functional domains are nonetheless distinct. In preparing this revision, I relied heavily on a series of works, many of them involving cross-language comparisons and text-distribution counts, most conspicuously Givón (ed. 1983), Givón (1992), Givón (ed. 1994), Givón (1995), Givón (ed. 1997a), Givón (2001) and Givón (2005). Of these, the last one comes closest perhaps to an ultimate neuro-cognitive understanding of the function of grammar. It purports to correlate the use of grammatical construction with the Theory of Minds research programme, whereby grammatical constructions are selected in the context of the speaker's attempting to account for the hearer's shifting epistemic and deontic mental states during communication. While this is, to my mind, the most promising interpretation of the communicative function of grammar, it accommodates readily the less sophisticated findings of the preceding works. The original chapter began as a colloquium talk at UCLA in Spring 1976, and recorded my indebtedness to Paul Schachter, Ed Keenan, Robert Hetzron, Dwight Bolinger and Harry Whitaker. This revision is indebted to many collaborators over the intervening years, most conspicuously to the participants in the cross-linguistic quantified text-based comparative studies in Givón (ed. 1983; ed. 1994; ed. 1997a).

"…Language is the structural organ of ideas… Apart from the communication between one human and another, speech is a necessary condition for reflection in solitude. As a phenomenon, however, language develops only in social intercourse, and humans understand themselves only by having tested the comprehensibility of their words on others…" (Humboldt, *Linguistic Variation and Intellectual Development*, 1836, pp. 34–36)

Then Hermann Paul:

"…The real reason for the variability of usage is to be sought only in regular linguistic activity… No other purpose operates in this, save that which is directed to the immediate need of the moment – the intention of rendering one's wishes and thought intelligible to others…" (Paul, *Principles of the History of Language*, 1890, Part I, p. 13)

Then Edward Sapir:

"…Language is a purely human and non-instinctive method of communicating ideas, emotions and desires by means of a system of voluntarily produced symbols…" (Sapir, *Language*, 1921, p. 8)

Though Otto Jespersen would have done just as well:

"…The essence of language is human activity – activity on the part of one individual to make himself understood by another, activity on the part of that other to understand what was in the mind of the first…" (Jespersen, *The Philosophy of Grammar*, 1924, p. 17)

Or George Zipf:

"…language is primarily a representation of experience. It may represent experience as a report of direct perceptual experience, such as in an account of a football game or in a description of some scene or event. Or it may represent tendencies to act and may be viewed as representative of potential activity, such as in an oration to persuade others to modify their behavior in accord with the wishes of the speaker… a function of the linguistic representation is to preserve or restore equilibrium. This equilibrium may be of two types: (a) inter-personal and (b) intra-personal…" (Zipf, *The Psycho-Biology of Language*, 1935, pp. 294–295)

Or Michael Halliday:

> "…A functional approach to language means, first of all, investigating how language is used: trying to find out what are the purposes that language serves for us, and how we are able to achieve these purposes through speaking and listening, reading and writing. But it also means more than this. It means seeking to explain the nature of language in functional terms: seeing whether language itself has been shaped by use, and if so, in what ways – how the form of language has been determined by the function it has evolved to serve…" (Halliday, *Explorations in the Functions of Language*, 1973, p. 7)

Or Dwight Bolinger:

> "…The natural condition of language is to preserve one form for one meaning and one meaning for one form…" (Bolinger, *The Form of Language*, 1977, p. x)

Or Simon Dik:

> "…a language is conceived of in the first place as an instrument of social interaction between human beings, used with the primary aim of establishing communicative relations between speakers and addressees…" (Dik, *Functional Grammar*, 1978, p. 1)

Ideological commitment, however admirable and evocative, leaves the gory details of the how and the why yet to be sketched out, a task that threatens to stretch half the way to eternity.

2.2 The role of grammar in human information processing

2.2.1 Overview: The functional organization of language

Linguists have traditionally, if somewhat sloppily, recognized two distinct functional mega-domains in language – lexicon and grammar, with the first pertaining to a vocabulary of **words** that code concepts, and the second to **verbal clauses** that code states or events or their concatenations in **clause chains**, (so-called 'sentences'). A more precise formulation would need to de-conflate the structures from functions more precisely, and in the process recognize that language performs two distinct mega-functions:

- **mental representation**
- **communication**

The mental representation system is, in turn, divided into:

- the conceptual lexicon
- propositional semantics
- multi-propositional discourse

2.2.2   The conceptual lexicon

The human conceptual lexicon is a repository of relatively time-stable, relatively socially-shared, relatively well-coded concepts which, taken together, constitute a cognitive map of our universe of experience, a universe that spans, at the very least:

- the external-physical universe
- the social-cultural universe
- the internal-mental universe.

By *time-stable* one means knowledge that is not in rapid flux. Thus, the meaning of 'horse' today will probably remain the same tomorrow or next Tuesday. Though gradual change of meaning in not precluded.

By *socially shared* one means that when launching into communication, speakers take it for granted that words have, roughly, the same meanings for all members of the relevant speech community. Though membership and shared meaning remain a matter of degree.

By *well-coded* we mean that each chunk of lexically-stored knowledge is more-or-less uniquely – or at least strongly – associated with a perceptual code-label, be it auditory or visual. Though again, well-codedness may be a matter of degree.

The conceptual lexicon, known to psychologists as **permanent semantic memory** (Atkinson and Shiffrin 1968), is most likely organized in the brain as a network of nodes and connections (Spitzer 1999). A word-node automatically activates a prototypical cluster of other, closely-related conceptual nodes (Swinney 1979; Neeley 1990). Within the lexical-semantic network, nodes stand for individual concepts or words, each with its own distinct meaning and code-label. Though it is entirely possible that some conceptual nodes remain uncoded by word-labels, as is indeed the case of animal and early-childhood cognition.

Lexical concepts are generic, conventionalized *types* of experience rather than individual tokens of experience. Such conventionalization presumably involves the development of a prototypical activation pattern of a cluster of connected nodes (Givón 2005, ch. 3). A lexical concept may represent a relatively time-stable entity – physical object, landmark, location, plant, animal, person, cultural institution or abstract concept – thus typically a *noun*. Or it may represent a more temporary action, event, process or relation, thus typically a *verb*. Or it may represent a time-stable quality or temporary state, thus typically an *adjective*.

2.2.3   Propositional information

One can combine concepts ('words') into propositionals ('clauses') about states or events in which entities partake. Such states or events may pertain either to the external world, or to the mental-internal world, or to the culturally-mediated world, or to various combinations thereof. Cognitive psychologists have long recognized the processing and storage of propositional information under the label of **long-term episodic-declarative memory** (Atkinson and Shiffrin 1968; Squire 1987).

2.2.4   Multi-propositional discourse

Individual state or event clauses may be combined into coherent discourse. Human discourse is predominantly multi-propositional; that is, its *coherence* transcends the bounds of its component event/state clauses. Multi-propositional discourse is also stored in **long-term episodic-declarative memory** (Loftus 1980; Gernsbacher 1990; Ericsson and Kintsch 1997).

2.2.5   The interaction between words, propositions and discourse

As an illustration of the hierarchic combinatorial relation of lexical concepts, propositional information and discourse coherence, consider the simple-minded example in (1), (2) and (3) below:

(1)   **Concepts = words:**
   a.   drive
   b.   insane
   c.   constant
   d.   abuse

  e. maid
  f. kill
  g. butler
  h. knife
  i. hide
  j. fridge

(2) **Propositions = clauses:**
  a. The maid was driven insane.
  b. The butler constantly abused the maid.
  c. The maid killed the butler with a knife.
  d. The maid hid the knife in the fridge last night.

(3) **Multi-propositional communication = discourse:**
  a. Having been driven insane
  b. by constant abuse,
  c. the maid killed the butler with the knife
  d. that she had hidden in the fridge the night before.

Taken by themselves, outside their propositional context, the words in (1a-j) convey only **conceptual meaning**. That is, you may only ask about them questions such as:

(4) a. What does 'drive' mean?
  b. Does 'drive' mean the same as 'abuse'?
  c. If someone is a 'maid', can they also be a 'butler', or a 'woman'?
  d. Is 'kill' related in meaning to 'die', 'slaughter, or 'murder', and if so, how?

 Combined into clauses, as in (2), the words in (1) now partake in the coding of **propositional information**. In addition to questions concerning the conceptual meaning of their words, as in (4), the individual clauses in (2) may also prompt questions of information, such as:

(5) a. Was the maid driven insane?
  b. Who abused the maid?
  c. Who killed the butler?
  d. Who did the maid kill?
  e. What did the maid kill the butler with?
  f. Did the maid kill the butler?
  g. Where did the maid hide the knife?
  h. When did the maid hide the knife in the fridge?

The multi-propositional discourse in (3), in which the atomic propositions in (2) are combined, has **discourse coherence**. In addition to questions of conceptual meaning (4), and propositional information (5), one may also now ask questions that pertain to that coherence, such as:

(6) a. Why did she kill him?
    b. How come she had a knife?
    c. Why did the maid hide the knife in the fridge?
    d. Could she perhaps have talked to him first before taking such a drastic step?
    e. Was her action reasonable?
    f. Was her action defensible in a court of law?

The questions in (6) may appear deceptively akin to those in (5). However, each question in (5) can be answered on the basis of knowing only one atomic proposition in (2). In contrast, none of the questions in (6) can be answered on the basis of such atomic propositional information alone. Rather, the knowledge of those propositions in their **discourse context** in (3), thus of the *coherent text*, is absolutely necessary in order to answer questions (6).

The partial dissociation between conceptual meaning and propositional information is easy to demonstrate by constructing grammatically well-formed propositions that make no sense; that is, propositions whose words are perfectly meaningful, each taken by itself, but still do not combine into a cogent proposition; as in Chomsky's ubiquitous example (7):

(7) Colorless green ideas sleep furiously

The meaning incongruities that make proposition (7) bizarre – 'colorless green', 'green ideas', 'ideas sleep', 'sleep furiously' – are all due to the semantic specificity of individual words. The relation between lexical meaning and propositional information is thus one of *inclusion*, or a one-way conditional inference. That is:

(8) **Inclusion relation between words and propositions:**
    "One can understand the meaning of a word independent of the proposition in which it is embedded; but one cannot understand a proposition without understanding the meaning of the words that make it up".

The partial dissociation between propositional information and discourse coherence can be just as easily demonstrated by stringing together perfectly informative but incoherently-combined propositions. Thus, scrambling the order of propositions in the coherent discourse in (3) yields the incoherent (9):

(9) a. Having killed the butler with the knife
     b. by constant abuse,
     c. the maid had been driven insane
     d. and had hidden it in the fridge the night before.

No propositional-semantic anomaly is discernible in any of the individual clauses (9a–d). The bizarreness of (9) as multi-propositional discourse is due to two factors:

- the lack of cross-propositional coherence
- the use of grammatical forms designed to code *another* coherent order, that of (3).

One could indeed conceive of ways by which the aberrant sequence of propositions in (9) can be made coherent – by **adjusting their grammatical structure** to the new order; as in:

(10) a. Having [failed] to kill the butler
      b. despite the constant abused,
      c. the maid was finally driven insane [upon realizing that]
      d. she had hidden the knife in the fridge the night before.

The relation between propositional information and discourse coherence is thus also a one-way conditional, or inclusion, relation. That is:

(11) **The inclusion relation between atomic propositions and coherent discourse:**
      "One can understand propositions independent of the discourse in which they are embedded; but one cannot understand the discourse without understanding the propositions that make it up".

2.3   The communicative function of grammar

The demonstration given above yielded two general observations, (8) and (11), concerning the hierarchic inclusion relation between the three functional mega-domains of language – words, propositions and discourse. Another conclusion – obvious if implicit – has been left unexpressed so far, a conclusion that emerges out of our comparison of the three multi-propositional texts above, (3), (9) and (10). All three involve the very same atomic propositions. Of the three, (3) and (10) are well-formed coherent texts, while (9) is ill-formed

and incoherent. Of the three, (9) and (10) share their propositional order but differ in grammar; while (3) and (9) share their grammar but differ in their propositional order. Still, by changing the grammar of the incoherent (9) to the grammar of (10), the scrambled order now yields a coherent text. Clearly, then, grammar has relatively little to do with propositional semantics *per se*, but rather seems to function as the coding instrument of discourse coherence. What we must do now is untangle our concept of grammar as a concrete **structural code** from the more subtle concept that has been implicit but largely submerged in the traditional functionalist discussion, of grammar as an instrument of coding **communicative function**.

2.3.1 Grammar as a structural code

The grammatical code is probably the latest evolutionary addition to the arsenal of human communication (Givón 1979, 1995, 2009; Lieberman 1984; Bickerton 1980, 1990; see also chs 5, 7, below). In ontogeny, children acquire the lexicon and pre-grammatical pidgin communication before acquiring grammar (Bloom 1973; Bowerman 1973; Givón 2009). Natural second language acquisition follows a similar course (Bickerton and Odo 1976a,b; Bickerton 1981, 1990; Bickerton and Givón 1976; Givón 1990, 2009). And in the natural communication of pre-human species, the existence of lexical-semantic concepts of both entities (nouns) and events (verbs) must be taken for granted if one is to make sense of behavior, communicative as well as secular (Perrett *et al.* 1989). Some lexical concepts are already well-coded in the natural communication of some non-human species (Cheney and Seyfarth 1990; Marler *et al.* 1991; *inter alia*).

Further, birds, dogs, horses, primates and other species are easily taught auditory or visual lexical code-labels for nouns, verbs and adjectives (Premack 1977; Gardner and Gardner 1971; Fouts 1973; Terrace 1985; Pepperberg 1999; Savage-Rumbaugh *et al.* 1998; *inter alia*). And the seeming ease with which such lexical learning takes place strongly suggests that the underlying neuro-cognitive structures are already in place.

In non-human primates, the supporting neurology for both semantic and episodic memory is essentially the same as in humans (Squire 1987; Petri and Mishkin 1994). However, observing the natural use of anything remotely resembling human grammar – morphology and syntax – in communicating animals, or teaching it to them, has been a uniform failure (Premack 1977; Terrace 1985).

Grammar is a much more abstract and complex code than the sensory-motor codes of the lexicon. At its most concrete, the grammatical signal involves four major coding devices:

(12) **Coding devices of the primary grammatical signal:**
    a. Morphology
    b. Intonation:
       • clause-level melodic contours
       • word-level contours, stress or tone
    c. Rhythmics:
       • pace or length
       • pauses
    d. Sequential order of words or morphemes

Some coding devices, such as morphology (12a) and intonation and stress (12b), are more concrete, involving the very same physical signals (sounds, gestures, letters) that code lexical meaning. But these concrete devices are integrated into a complex whole with the more abstract elements of the code – rhythmics (12c) and sequential order (12d).

From the primary grammatical signals in (12), yet-more-abstract levels of grammatical organization must be inferred. They are:

(13) **More abstract levels of grammatical organization:**
    a. **Hierarchic constituency organization**
       • morphemes into words
       • words into phrases
       • phrases into clauses
       • clauses into clause-chains or paragraphs
    b. **The grammatical category-labels**
       • noun, verb, adjective
       • noun phrase, verb phrase
    c. **Scope and relevance relations**
       • operator-operand relations
       • grammatical relations (subject, object)
    d. **Government and control relations**
       • agreement
       • co-reference
       • dependencies
       • finiteness

The levels of clausal organization listed in (13) are the more abstract components of grammar. How they are extracted – or inferred – from the more concrete signals (12) is an important question in the study of language processing.

2.3.2   Grammar as communicative function

Grammar codes, simultaneously, both propositional semantics and discourse coherence. This is indeed one of the most baffling facts about grammatical structure, that although it is located almost entirely inside the verbal clause,[2] its functional scope is primarily *not* about the propositional information couched in the clause ('who did what to whom where, when or how'). Rather, grammar is predominantly about the coherence relations between the proposition (clause) and the wider **communicative context**, be it the current text, the face-to-face speech situation and, within the latter, the speaker-hearer interaction.

Our traditional structuralist methodology of examining – or experimenting with – isolated clauses has tended to obscure what grammar actually does. But the simple-minded demonstration given in (1) through (11) above makes it clear that grammar has little to do with atomic verbal clauses (proposition), but rather with their discourse context – i.e. communicative function.

In the same vein, our earlier discussion (ch. 1) of the cross-language variation in coding the functional domain of the passive is just as clear a demonstration that clause-types (constructions) cannot be defined structurally, but rather functionally. It is only by examining how the same functional domain is coded in different languages, and thus constructing a **syntactic typology**, that we arrive at a more coherent understanding of the function of syntactic structure.

Some of the most common grammatical sub-systems that code discourse coherence are:

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2.   Some grammatical operators, such as modal connectives, L-dislocated constituents, or ADV-phrases are clause-initial, and are separated by a pause from the ensuing clause, as in e.g., *Apparently, she left weeks ago* (modal connective); *Joe, nobody saw him there* (L-dislocation); *Two hours later, they showed up* (ADV-phrase).

(14) **Major discourse-oriented grammatical sub-systems:**

traditional structural label	communicative function
a. grammatical roles (subject, object)	referential coherence
b. definiteness	referential coherence
c. anaphora and pronouns	referential coherence
d. voice (active, inverse, passive, antipassive)	referential coherence
e. L-dislocation, R-dislocation	referential coherence
f. relative clauses	referential coherence
g. verbal complement	epistemic/deontic perspective
h. tense, aspect, modality	temporal and modal coherence
i. focus and contrast	hearer's epistemic perspective
j. negation	hearer's epistemic perspective[3]
k. speech acts	speaker/hearer modal intent
l. clausal conjunction and subordination	cross-clausal coherence

Of these grammatical sub-systems, we will discuss here in some detail: referential coherence, pragmatic voice, relative clauses and verbal complements. Each in its own way illustrates the interaction between communicative function, cross-language typological diversity, and the diachronic rise of grammar.

2.4 Theme-and-variation in syntax and the markedness of clause-types

2.4.1 Overview

Of the insights introduced in the early days of Transformational-Generative Grammar, none shines brighter than the notion of **transformational relation** between clause types (Harris 1956; Chomsky 1957, 1965). Harris couched his transformations in the purely structural terms of **co-occurrence** – the same subject, verb and object recurring through all syntactically-related clauses.

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3. Negation is a good example of how a grammatical construction that had been traditionally described in purely propositional-semantic terms – reversing the truth-value of a proposition – turns out on closer inspection to have a hearer-oriented pragmatic function (see ch. 3 below).

Chomsky's revised formulation (1965, ch. 2) conceded explicitly one functional correlate of grammar – propositional semantics ('semantic interpretation'). However, this concession was confounded by the treatment of **deep structure** as a "syntactic" entity. Syntactic transformations then converted deep structure into the **surface structure** attested in actual utterances. That is:

> "…The syntactic component of a grammar must specify, for each sentence, a *deep structure* that determines its **semantic interpretation** and *surface structure* that determines its phonetic interpretation…" (Chomsky 1965, p. 16; boldfacing added)

It didn't take long for Ross and Lakoff (1967) to point out that there was nothing 'syntactic' about deep structure; it simply stood for the propositional-semantic value of clauses. What remained largely unresolved in *Aspects* was the motivation for syntactic transformations (1965, ch. 3), except for, perhaps, 'stylistic variation'. Thus:

> "…Katz and Postal (1964) extended these observations and formulated them in terms of a general principle, namely that *the only contribution of transformations to semantic interpretation is that they interrelate Phrase-Markers* (i.e. combine semantic interpretations of already interpreted Phrase-Markers in a fixed way). It follows then that transformations cannot introduce meaning-bearing elements…." (Chomsky 1965, p. 132)

2.4.2   Theme and variations in syntax

It is hardly an accident that the transformational formats of Harris (1956) and Chomsky (1965) chose the main-declarative-affirmative-active clause as the reference-point ('deep structure', 'theme') from which all other clause-types are derived by transformations. This is nothing but the traditional grammarian's intuition dressed up in formal garb. This privileged clause-type has the following well-know characteristics:

- It is the most frequent in natural human communication[4]
- It tends to carry the bulk of new information in discourse
- It is syntactically least complex[5]

As a simple illustration, consider:

(15) (i) **Main-declarative-affirmative-active ('theme'):**
   a. Marla hit Henry
   (ii) **Subordinate (non-main) variations:**
   b. The woman [**who** hit Henry]…   (relative clause)
   c. Marla wanted [**to** hit Henry]   (modality verb complement)
   d. He made [Marla hit Henry]   (manipulative verb complement)
   e. He said [**that** Marla hit Henry]   (P-C-U verb complement)
   f. [**When** Marla hit Henry], she screamed   (adverbial clause)
   g. [**Having** seen Henry], Marla screamed   (participial clause)
   h. [Marla**'s** hitt**ing** Henry] was not a good idea
                                           (nominalized subject)
   (iii) **Non-declarative variations:**
   i. Hit Henry!   (imperative)
   j. **Who** hit Henry?   (wн-interrogative)
   k. **Did** Marla hit Henry?   (yes/no-interrogative)
   (iv) **Negative variation:**
   l. Marla **didn't** hit Henry   (negative)
   (v) **De-transitive variations:**
   m. Henry **was** hit (**by** Marla)   (passive)
   n. **As for** Henry, Marla hit him   (inverse)
   o. Marla hits things   (antipassive)
   p. Marla hit **herself**   (reflexive)
   q. Marla and Henry hit each other   (reciprocal)

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4.   While this is overwhelmingly the case, some specialized discourse types are skewed toward non-declarative clauses. Thus for example, exams are predominantly made out of interrogative speech acts, while instruction manuals are heavily tipped toward imperatives. Likewise, academic discourse has a much higher frequency of passive clauses than popular fiction (see further below).

5.   There are some obvious exceptions to this. For example, imperatives and other constructions with a zeroed-out subject, such as equi-subject V-complements, participial clauses or clauses with anaphoric subject or object are, technically, less complex than their 'deep structure' counterparts.

2.4.3 The text-frequency distribution of major clause-types

The following tables illustrate the kind of biased frequency distribution of the 'theme' vs. 'variant' clause-types that can be found in natural text. Consider first the text distribution of main vs. subordinate (embedded) clauses (Givón 1991a).

(16) **Frequency distribution of main vs. subordinate clauses in English narrative**

written-academic						oral-informal					
conjoined		subordinate		total		conjoined		subordinate		total	
N	%	N	%	N	%	N	%	N	%	N	%
43	36.0	77	**64.0**	120	100.0	120	**86.0**	20	14.0	140	100.0

Consider next the text distribution of declarative vs. non-declarative clauses, first in oral narrative vs. conversation (Givón 1991a).

(17) **Frequency of non-declarative vs. declarative clauses in English oral narrative and conversation**

narrative						conversation					
non-declar.		declar.		total		non-declar.		declar.		total	
N	%	N	%	N	%	N	%	N	%	N	%
/	/	109	**100.0**	109	100.0	46	**46.0**	53	53.0	99	100.0

Consider next the text-distribution of declarative vs. non-declarative clauses in written narrative vs. embedded dialogue (Givón 1991a).

(18) **Frequency of non-declarative vs. declarative clauses in English written narrative and embedded dialogue**

narrative						dialogue					
non-declar.		declar.		total		non-declar.		declar.		total	
N	%	N	%	N	%	N	%	N	%	N	%
/	/	81	**100.0**	81	100.0	22	**16.0**	115	84.0	137	100.0

Consider next the text distribution of affirmative vs. negative clauses in two different English text-types (see ch. 3, below).

(19) **Frequency distribution of affirmative vs. negative clauses in written English academic vs. fiction narrative text**

| | clause type | | | | | |
| | affirmative | | negative | | total | |
text type	N	%	N	%	N	%
academic	96	95.0	5	5.0	101	100.0
fiction	142	88.0	20	**12.0**	162	100.0

Consider, lastly, the text distribution of active vs. passive clauses in various types of English narrative text (Givón 1991a).

(20) **Frequency distribution of active vs. passive clauses in written English**

| | clause type | | | | | |
| | active | | passive | | total | |
text type	N	%	N	%	N	%
academic	49	82.0	11	**18.0**	60	100.0
fiction	177	91.0	18	**9.0**	195	100.0
news	45	92.0	4	**8.0**	49	100.0
sports	64	96.0	3	**4.0**	67	100.0

In the subsequent sections we will deal in a more fine-grained way with the functional definition of some of the major grammatical constructions that were categorized somewhat loosely in (12) above.

2.5 The grammar of referential coherence

2.5.1 Preliminaries

As can be seen in (14) above, multiple grammatical constructions are involved in coding the complex functional domain of referential coherence. This highlights the importance of nominal reference and its management in human

communication. The most frequent grammatical devices used to code referential coherence are:

(21) **Major referent-coding devices:**
    a.   Zero anaphora
    b.   unstressed/bound anaphoric pronoun
    c.   stressed independent pronouns
    d.   definite NPs
    e.   indefinite NPs
    f.   modified NPs

But to understand how these grammatical devices perform their communicative functions, one must consider them in the context of the overall organization of coherent discourse.

2.5.2   Discourse structure and referential coherence[6]

Human discourse is typically multi-propositional. That is, we string together verbal event-or-state clauses in coherent sequences, ones that maintain a high degree of **continuity**. The sub-elements – *strands* – of discourse coherence tend to persist from one clause to the next across stretches of discourse, or **clause-chains**. The overall thematic coherence of human discourse is then the tapestry-like product of those multiple strands, of which the most concrete and easier-to-track are:

(22) **Main strands of discourse coherence**
    a.   referents
    b.   spatiality
    c.   temporality
    d.   tense-aspect-modality
    e.   action routines

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6.   The material surveyed in this section is taken from the more extensive treatment in Givón (2017, chs 1, 2). The aspect of referential coherence discussed in this section involves referential continuity, measured heuristically in text as the anaphoric distance (AD) of a referent from its nearest previous occurence in the text. The other major aspect of referential coherence, topicality or importance, measured heuristically in text as cataphoric persistence (CP), will be discussed further below.

Most commonly, these individual strands of discourse coherence maintain their continuity together, breaking together at the end of coherence units. Those coherence units are organized hierarchically, with lower units combining into higher ones; schematically:[7]

(23) **Hierarchic structure of discourse**

       lower

       clause
       clause chain
       paragraph
       episode
       story

        higher

The lowest and most basic unit of discourse-coherence above the atomic clause is the **clause chain** (a.k.a. 'sentence'), the arena in which the bulk of grammatical devices perform their assigned communicative functions. The overall structure of clause chains can be given as, schematically:

(24) **Structure of clause chain**
    …# RD, CI, CM,CM,CM,CM, (…..),CF#…
    RD = reorientation device
    CI = chain-initial clause
    CM = chain-medial clause
    CF = chain-final clause
    # = chain boundary

Prosodically, a clause tends to come under a unified intonation contour. Within-clause (between-words) intonation breaks tend to be ca. 50mscs long. Between-clause (chain-medial) intonation breaks tend to be ca. 100msecs long.

---

7. While the hierarchic organization of discourse is most conspicuous in narrative text, it is not fundamentally different in conversation. That is, in spite of the fact that conversation involves changes of perspective ('turns'), coherent conversation still has a hierarchic structure roughly similar to that of narrative, albeit more complex. This becomes clear when referential and thematic coherence is studied across multiple turns. For an extensive discussion of this, see Chafe (1997), Coates (1997), Ervin-Tripp and Kuntay (1997), and Linell and Korolija (1997).

And between-chain intonation breaks tend to be longer than 100msecs.[8] Inter-clausal (chain-medial) intonation breaks correspond, roughly, to comma punctuation [,] in written discourse, and inter-chain (chain-final) breaks to period [.] or semi-colon [;].

The major referent-coding devices listed in (21) above can be ranked in terms of their degree of referential continuity:[9]

(25)   **Referent-coding devices and referential continuity**
         lowest referential continuity
         ———————————————————————
         a.   indefinite NPs
         b.   definite NPs
         c.   stressed independent pronouns
         d.   unstressed anaphoric pronouns
         e.   zero anaphora
         ———————————————————————

         highest referential continuity

Grammatical relations – subject vs. direct object vs. oblique – also play an important role in the coding of referential coherence, intersecting with and enriching the referent-coding devices in (21)/(25). All other things being equal, a referent marked as *subject* tends to be more continuous and more important; one marked as *direct object* tends to be less continuous and less important; and one marked as *oblique* ('indirect object') tends to be less continuous and less important yet. Word-order can also play an important role in coding referential coherence, most likely along the dimension of referential importance.[10]

In spite of the seeming strong statistical association between referential **continuity** ('accessibility', 'predictability') and referential **importance** ('topicality'), these two dimensions of referential coherence are distinct and can be dissociated. Thus, for example, an *indefinite* NP (25a) codes, by definition, an anaphorically discontinuous referent which may nevertheless be highly topical or persistent cataphorically.

———————————————————————

8.   For discussion and text-based measures, see Givón (1991b; 2015a, ch. 23).

9.   For discussion and quantified cross-language studies, see Givón (ed. 1983).

10.   For extensive discussion and quantified cross-language comparison, see Givón (ed. 1983, ed. 1997a). Pragmatic ('flexible', 'free') word-order is also an important referent-coding device, interacting with both referential accessibility and referential importance (Givón 1988). See Section 2.5.6. below.

2.5.3   **High-continuity devices**

Consider first the contrast between zero anaphora and unstressed anaphoric pronouns in English:

(26)   **Unstressed anaphoric pronoun vs. zero:**
John went to the mirror, [Ø] examined his hair, [Ø] sighed and [Ø] turned.
   a.   Then **he** walked out.
   b.   *Then [Ø] walked out

Both the unstressed anaphoric pronoun in (26a) and anaphoric zero in (26b) signal maximal referential continuity. Yet (26b) is an inappropriate continuation, because zero anaphora cannot be used in English across chain boundaries, only across chain-medial junctures.

Consider next the contrast between unstressed ('anaphoric') and stressed ('independent') pronouns:

(27)   **Unstressed/anaphoric vs. stressed/independent pronouns:**
Mary talked to Marcie for a while.
   a.   Then **she** left. (⊃ Mary left)
   b.   Then **SHE** left. (⊃ Marcie left)

The unstressed anaphoric pronoun in (27a) signals referential continuity (SS). The stressed independent pronoun in (27b) signals referential discontinuity or **switch reference** (DS). This use of stressed independent pronouns also applies to objects. Thus, consider the complex subject-object switches in (28) below, all of them in chain-medial contexts:

(28)   John slapped Marcie, then **SHE** slapped **HIM**, then **HE** left in a huff and **SHE** left too.

In Spanish, where subject pronominal agreement is obligatory, the two highest-continuity devices, anaphoric pronouns (25d) and zero anaphora (25e), have merged into a single device – subject pronominal agreement, which can be used in both chain-medial and cross-chain contexts. Thus compare the grammatical marking of referential continuity in Spanish (29a,b), below, with the English (26a,b), above:

(29) Juan volvi-**ó**   a la casa y   comi-**ó** su cena.
     J.   returned-**3s** to the house and ate-**3s**   his dinner
     'John went back to the house and ate his dinner.

    a. Luego sali-**ó**   de nuevo.
       then   got.out-**3s** of new
       Then **he** went out again'.

    b. *Luego **él**   sali-**ó**   de nuevo.
       then   **3s** got.out-**3s** of new
       *Then **HE** went out again'.

The infelicity of (29b) in Spanish and (26b) in English is due to the fact that it implies switch reference (and contrast) where none is warranted by the context. Such switch-and-contrast, now used appropriately, is seen in (30b) below, motivated by the context and fully corresponding to the English usage in (27b) above:

(30) María habl-**ó**   con Mercedes.
     Mary talked-**3s** with Mercedes.
     'María talked with Mercedes.

    a. Luego volvi-**ó**   a la casa.
       Then   return-**3s** to the house
       'Then **she** went home' (she = María)

    b. Luego **ella** volvi-**ó**   a la casa.
       Then   **she** returned-**3s** to the house
       Then **SHE** went home' (she = Mercedes)

A similar functional distribution, with obligatory grammatical agreement collapsing the function of zero anaphora and unstressed/anaphoric pronouns, can be seen in other languages with obligatory subject-agreement paradigms, such as Hebrew or Swahili.

In languages such as Japanese or Chinese, which have no unstressed anaphoric pronouns, zero anaphora codes *both* chain-medial and cross-chain referential continuity, thus corresponding to pronominal agreement in Spanish. Ute (Numic, No. Uto-Aztecan) is roughly at this typological stage, since its unstressed clitic pronouns are optional and roughly 70% of continuous referents are still zero-coded.[11] As an illustration, consider the following story-initial sequence:[12]

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11. See Givón (2017, ch. 4.)

12. "Hungry Coyote races Skunk for the prairie dogs", as told by Mollie B. Cloud (Givón ed. 2013).

(31) a. yoghovᵾchi̱ 'u,   [Ø] pagha'ni-na-pᵾga-'ura,
          Coyote/s   the/s   walk.about-HAB-REM-be
          'Coyote, **he** kept wandering about,

      b. kach [Ø] 'ini-a-sapa̱ paqha-na-pᵾ-a,   [Ø] 'ɵɵ-'ay-kwa̱-pᵾga,
          NEG   WH-O-MOD kill-HAB-REM-NEG   bone-be-go-REM
          he hadn't killed anything (for a long time), **he** became bone-skinny,

      c. ka-'ini-aa-sapa̱   [Ø] paqha-na-pᵾ-a,
          NEG-WH-O-MOD   kill-HAB-REM-NEG
          he hadn't killed anything (for a long time),

      d. [Ø] tᵾgᵾy-whqa-vɵrɵ-na-pᵾga-'ura…
              hungry-search-walk-HAB-REM-be
          he was walking about searching hungry…

A second participant is now introduced as the subject of a *presentative* con-
struction, first with a hedge in (32e) below, then as an *object* (32f). Then an
independent pronoun is used in (32f) for *switch-subject* to the new referent, as
in English and Spanish. Such switching is repeated several times in succession
(32g,h). Thus, beginning with Coyote still being the topical referent:[13]

(32) e. … 'ú-vway-aqh-'ura 'ú-vwaa-tᵾ-'ura 'íni-kway 'ura-pᵾga…
            there-at-it-be   there-at-DIR-be WH-MOD   be-REM
          …Then, right there, there was what's-his-name…

      f. mu̱kwapi [Ø] maay-pᵾga, **'uwas**-kway pacha'ay-kyay-ku̱.
          spider/O   see-REM   **3s/s**-TOP   stick-ANT-SUB
          he saw a spider, as **HE** (spider) was stuck (there).

      g. 'ú-vway-aqh-'ura **'uwas** magᵾni̱-pᵾga, [Ø] tᵾka-vaa-chi̱-'**u**.
          there-at-it-be   **3s/s** pounce-REM   eat-IRR-NOM-**3s**
          so right away **HE** (Coyote) pounced, intending to eat **it** (spider).

      h. 'u-vyay-aqh-'ura **'uwas**-'ura 'áy-pᵾga…
          there-at-it-be   **3s/s**-be   say-REM
          so then **HE** (Spider) said…'

2.5.4   **Low continuity devices**

We have already seen how stressed independent pronouns function as
switch-reference devices. Such a use of stressed pronouns is found most typi-
cally in chain-medial contexts, in episodes where two participants alternate as
the topical referent. By using the pronoun alone in such contexts, the speaker
signals to the hearer: "Go back to the previous occurrence of a different referent

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13. *Ibid.*

and reinstate it", as in (32f,g,h) above. As a result, the **anaphoric distance** between the current and previous occurrence of the referent in such mid-chain switches tends to be 2–3 clauses.[14]

Full NPs, in contrast with stressed independent pronouns, are used either to introduce into the discourse brand new ('indefinite') referents, or to re-introduce old ('definite') referents after a considerable gap of absence. When an indefinite NP is slated to be topical/important, and thus persist in the subsequent discourse, most commonly some **presentative device** is used in its first introduction. Such devices most typically code the new topical referent as the **subject** of a presentative clause, as in English existential clauses. In Ute, the equivalent of such presentative devices involves the use of an independent pronoun in combination with the full NP. Thus compare:

(33) a. **English:**
          Once there was **a wizard**, he lived in Africa, he went to China to
          get a lamp….
      b. **Ute**:
          'uwas-'ura **yoghovᴜchi̲** 'ura-pᴜga; khura
          3s/s-be   **coyote/s**   be-REM   then
          tᴜgᴜy-naru'a-puga, tᴜkua-tᴜgᴜy-narua-puga…
          hunger-buy-REM   meat-hunger-buy-REM
          'There was once **Coyote**; well he got hungry, he got meat-hungry…'

But new referents are also commonly introduced into discourse as **indefinite objects**, and only later are upgraded into higher topicality – and re-introduced as **definite subjects**. This is the Ute strategy in (32f) above, reproduced as (34) below, where 'spider' is introduced first as an indefinite object and then immediately upgraded to subject in the next clause, now coded by a stressed independent subject pronoun:

(34) mu̲kwapi [Ø] maay-pᴜga, **'uwas**-kway pacha'ay-kyay-ku̲…
      spider/O   see-REM   **3s/s**-TOP   stuck-ANT-SUB
      he saw a spider, as **HE** (spider) was stuck (there)…'

When old referents are re-introduced into the discourse after a gap of absence greater than 2–3 clauses, they are most commonly coded as **definite NPs**. In addition, when the old referent is brought back across a chain or paragraph boundary, with a gap of absence – anaphoric distance – of 10–20 clauses, special chain-initial **reorientation devices** (RD; see (24) above) are used, most often

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14. See text counts further below.

with a pause (intonation break) that renders the construction **paratactic** rather than syntactic. Such re-orientation devices can be ranked in terms of the **anaphoric distance** (AD) to the previous mention of the referent, or the depth and complexity of the preceding context vis-a-vis which the re-orientation proceeds. That is:

(35) **Common chain-initial re-orientation devices:**
      Shorter-distance re-orientation

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  a. **Subject L-dislocation**:
      …Now **the other guy**, **he** quit, just took off and vanished…
  b. **Object L-dislocation**:
      …Now **the other guy**, we saw **him** just once, then he took off…
  c. **Conjunction**:
      …**But then** the other guy took off and vanished…
  d. **Adverbial phrase**:
      …**The next minute**, the other guy took off, just vanished…
  e. **ADV-clause**:
      …**After she finished talking**, the guy took off…

      Longer-distance re-orientation

L-dislocation (35a,b) is of considerable interest in studying the diachrony of pronominal agreement. At least *prima facie*, it displays two features that can overlap with pronominal agreement – once the paratactic L-dislocation clause is condensed into a simple syntactic clause:

● The L-dislocated NP is co-referent to the following anaphoric pronoun.
● That unstressed anaphoric pronoun is adjacent to the verb and can readily cliticize to it.[15]

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15. For a more extensive discussion, see Givón (2017, ch. 3). Another potential paratactic precursor to pronominal agreement is R-dislocation, as in:… *and **he** disappeared, John, I mean…*, or… *and they saw **him** there, John, I* mean… The probability of R-dislocation being the diachronic precursor to subject pronominal agreement is lower, however, since R-dislocation is typically a *chain-final* device, recapitulating a recurrent referent that was marked by zero or anaphoric pronouns in the preceding clause.

2.5.5 Quantitative text-distribution of referent-coding devices

2.5.5.1 Preliminaries

In the preceding section we identified three clusters of major referent-coding devices in terms of their anaphoric continuity:

(36) **Expected anaphoric distance of referent-coding devices:**

continuity	devices	anaphoric distance
highest (chain-medial)	zero unstressed pronouns pronominal agreement	1 clause
intermediate (chain-medial)	stressed pronouns	2–3 clauses
lowest (chain-initial)	full NPs	> 3 clauses

In this section we will survey the quantitative evidence, obtained from the study of written or oral discourse across a number of languages, that backs up these general predictions.

2.5.5.2 English

English is a rigid SVO language using four major referent-coding anaphoric devices: zero, unstressed/anaphoric pronouns, stressed/independent pronouns and full definite NPs. In Table (37) below a comparison is given of the mean anaphoric distance (AD) values for these four devices in written English narrative, re-computed from Brown (1983).

(37) **Mean AD values of major referent coding devices in written English**

category	N	mean AD value
zero	314	1.00
unstressed PRO	1,162	1.72
stressed PRO	27	2.27
definite NP	1,023	16.66

The comparable values for spoken English narrative are given in Table (38) below, re-computed from Givón (1983a).

(38)   **Mean AD values of major referent coding devices in spoken English**

category	N	mean AD value
zero	117	1.0
unstressed PRO	336	1.0
stressed PRO	75	3.75
definite NP	69	10.15[16]

Within bounds, both written and spoken English conform to the expected values in (36) above. What is more, the high text-frequency of zero and unstressed pronouns underscores their use as high-continuity devices.

2.5.5.3 **Ute**

Ute is a flexible-order ex-SOV language with a high text-frequency of anaphoric zeros. It also employs optional, low-frequency unstressed anaphoric pronouns, and those can cliticize on any word-type, often on the first word in the clause ('2nd position clitics'), most commonly on the verb.[17] Table (39) below, re-computed from Givón (1983b), summarizes the mean AD values of the major referent-coding devices in spoken Ute narrative.

(39)   **Mean anaphoric distance values of major referent coding devices in spoken Ute**

category		N	mean AD value
zero		321	1.21
unstressed PRO		42	1.54
stressed PRO	SV	75	2.80
	VS	61	1.95
	OV	12	2.41
	VO	1	1.00
definite NP	SV	39	10.84
	VS	25	**1.48**
	OV	34	9.67
	VO	13	**4.46**

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16. Indefinite NPs were not counted here since they have no anaphoric antecedent.

17. For further discussion see Givón (2017, ch. 4).

Within bounds, the AD figures for Ute conform to the predictions made in
(34) above, but with one crucial exception – the low AD value for post-verbal
(VS) subject NPs and, to a lesser extent, of post-verbal (VO) object NPs. This
effect of pragmatically-controlled word-order will be discussed further below.

2.5.5.4 Biblical Hebrew

Early Biblical Hebrew (EBH) is a VO language with flexible subject position
(VS vs. SV) and a strong statistical tendency toward VSO. The two main verbal
conjugations, the suffixal *perfect* and the prefixal *perfective* and *irrealis*, have
obligatory subject pronominal agreement. Object pronominal agreement on the
verb is optional, and alternates with unstressed object pronouns written as sep-
arate words (as in English). Since subject pronominal agreement is obligatory
in the main conjugations (perfect, perfective, irrealis), zero anaphora is rare,
found mostly in non-verbal (nominal, participial) clauses. Table (40) below,
re-computed from Fox (1983), summarizes the anaphoric distance values for
the major reference-coding devices in Early Biblical Hebrew.

(40) **Mean anaphoricv distance values of major referent coding devices
      in Biblical Hebrew**

category		N	mean AD value
pronom. AGR S		295	1.10
pronom. AGR O		57	1.10
stressed PRO-S		87	2.87
stressed PRO-O		52	1.17
definite NP	SV	142	9.86
	VS	357	**6.51**
	OV	12	25.08
	VO	267	**12.30**

The AD figures for pronominal agreement and stressed subject pronouns con-
form, in the main, to the predictions in (36), above. The effect of the pragmati-
cally-controlled word-order on the AD values of definite NPs will be discussed
further below.

2.5.5.5 Spoken Spanish

Spanish is a rigid VO language with a flexible subject position (SV vs. VS) and obligatory subject agreement in all verbal conjugations, thus typologically similar to Biblical Hebrew. Unstressed anaphoric object pronouns are cliticized to the verb, pre-verbally (OV) in most finite conjugations and post-verbally (VO) in the infinitive and imperative conjugations. The mean anaphoric distance values for the various referent-coding devices in spoken Venezuelan Spanish are given in Table (41) below, re-computed from Bentivoglio (1983).

(41)   **Mean anaphoric distance values of major referent coding devices in spoken Spanish**

category	N	mean AD value
pro-AGR S	328	1.30
O	137	1.65
DAT	112	1.50
stressed PRO-SV	133	1.90
VS	11	**1.64**
stressed PRO-VO	6	1.50
definite NP SV	34	4.20
VS	10	**2.50**
VO	20	8.57

Within bounds, these results conform to the predictions in (36), above. As in Biblical Hebrew, a word-order effect is also discernible in Spanish, with post-verbal subject (VS) coding more continuous referents – lower AD values – than pre-verbal subjects (SV).

2.5.5.6 Japanese

Japanese is a rigid SOV language with no unstressed anaphoric pronouns or verb pronominal agreement. The AD values reported below, re-computed from Hinds (1983), cover oral narrative, female-female conversation, and male-male conversation. Table (42) below, summarizes the results for spoken Japanese narrative.

(42) **Mean AD values of major referent-coding devices**
in Japanese spoken narrative

category	N	mean AD value
zero	50	1.10
stressed PRO	/	/
definite NP	147	6.87

Table (43) below summarizes the results for the female-female conversation.

(43) **Mean AD values of major referent-coding devices**
in Japanese female-female conversation

category	N	mean AD value
zero	108	1.55
stressed PRO	11	4.35
definite NP	25	13.5

Table (44) below summarizes the results for the male-male conversation.

(44) **Mean AD values of major referent-coding devices**
in Japanese male-male conversation

category	N	mean AD value
zero	114	3.10
stressed PRO	27	5.27
definite NP	65	10.5

The results of the Japanese AD measures for spoken narrative and female-to-female conversation conform, in the main, to the prediction in (36) above. The results for the male-male conversation stand out in two categories – zero anaphora and stressed pronouns. Both seem to be used in contexts of *much lower* referential continuity – higher AD values – than expected. Such usage may be due to the higher informational predictability in face-to-face conversation between intimates in this particular diad. It may also be due to a more careless style of verbal interaction among young males.

2.5.5.7 **Mandarin Chinese**

Mandarin Chinese is a rigid SVO language, with an extensive use of zero anaphora and no unstressed anaphoric pronouns, in this respect rather similar to Japanese. The correlate between grammatical role – subject vs. direct object – and frequency of zero anaphora, stressed pronouns and full NPs in Mandarin was studied by Pu (1997). Her results are reproduced in Table (45) below.

(45) **Grammatical role and frequency of zero anaphora
in Mandarin oral narrative**

role	full NP		stressed PRO		ZERO		TOTAL	
	N	%	N	%	N	%	N	%
S	822	40.2	398	19.4	829	**40.4**	2046	100.0
DO	648	85.3	65	8.5	47	**6.2**	760	100.0
others	525	97.9	/	0.0	11	**2.1**	563	100.0
					887			

The bulk of zero anaphors in the Mandarin text – 829 out of 887 or **82.9%** – code the subject participant, the most topical and most continuous in discourse. In addition, **40.4%** of all subjects are zero-coded, as compared to only 6.2% of direct object and 2.1% of other grammatical roles.

2.5.6 **Word order and referential continuity**

As noted earlier, several of the languages considered above deploy some word-order variation – SV vs. VS or OV vs. VO – as part of the inventory of devices used to code referential coherence. In this section we will consider briefly three languages: spoken English (rigid SVO), spoken Ute (flexible word-order), and Early Biblical Hebrew (rigid VO, flexible VS-SV).[18]

2.5.6.1 **Word-order and referential continuity in spoken English**

In Table (46) below we re-capitulate the AD figures listed in Table (20) above for written English narrative (Brown 1983), adding for comparison the

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18. For a more extensive discussion of the pragmatics of word-order flexibility see again Givón (1988).

values for L-dislocated (fronted) and R-dislocated (post-posed) definite NPs
from another study (Givón 1983a).

(46) **Mean anaphoric distance values of major referent-coding devices
in written English**

category	N	%	mean AD value
zero	117	18.1	1.0
unstressed PRO	336	52.1	1.0
stressed PRO	75	11.6	3.75
definite NP (SVO)	69	10.7	**10.15**
L-dislocated NP	44	6.8	**15.34**
R-dislocated NP	4	0.62	**1.00**
TOTAL:	645	100.0	

Several things are striking about these recapitulated results. First the combined
high-continuity devices – zero anaphora and unstressed pronouns – constitute
70.2% of the total sample of nominal referents in the text. This underscores
the use of these two devices to code maximally-continuous referents, as is also
suggested by their identical **1.0** – one clause back – AD values.

The average AD value for definite NPs in the most common SVO order
of English, comprising 10.7% of the total referents in the text, is **10.15** clauses
back. L-dislocated NPs, at 6.8% of the total sample, displays an even higher
AD value – **15.34** clauses back. That is, L-dislocation is used in spoken English
to code referents that are brought back into the discourse after a large gap of
absence, easily transcending the length of the current clause-chain or even the
current paragraph.

Lastly, R-dislocated NPs, at a minuscule **0.62%** of the total sample, code
referents with the same high referential continuity – **1.0 AD** – as zero anaphora
and unstressed pronouns.

2.5.6.2 Word order and referential continuity in spoken Ute

Table (47) below recapitulates the AD values of the various referent-cod-
ing devices in spoken Ute narrative given in (39) above. The re-capitulation
highlights the contrast between pre-verbal (SV, OV) and post-verbal (VS, VO)
referents (Givón 1983b).

(47) **Mean AP values of major referent coding devices in spoken Ute**

category		N	%	mean AD value
zero		321	51.5	1.21
unstressed PRO		42	6.7	1.54
stressed PRO	SV	75	12.0	2.80
	VS	61	9.8	**1.95**
	OV	12	1.9	2.41
	VO	1	0.16	**1.00**
definite NP	SV	39	6.2	10.84
	VS	**25**	4.0	**1.48**
	OV	34	5.4	9.67
	VO	**13**	2.1	**4.46**
TOTAL:		623	100.0	

As in English, referents that are placed post-verbally (VS, VO) have a much lower AD value than those placed pre-verbally (SV, OV). That is, post-verbal position marks referents with much higher referential continuity, with AD values – 1.95, 1.00, 1.48, 4.46 – approximating those of zero anaphora and unstressed clitic pronouns (1.21–1.54).

Table (48) below lists the distribution of various referent-marking devices in contexts of high **thematic continuity** (paragraph-medial) vs. low thematic continuity (paragraph-initial) in spoken Ute narrative, re-computed here from Givón (1983b).

(48) **Distribution of the various referent-coding categories in contexts of high thematic continuity (paragraph-medial) vs. discontinuity (paragraph-initial) in spoken Ute**

category		paragraph-initial		paragraph-medial		total	
		N	%	N	%	N	%
zero		1	0.4	320	**99.6**	321	100.0
clitic PRO		/	/	42	**100.0**	42	100.0
indep-PRO	SV	26	34.0	49	66.0	83	100.0
	VS	6	9.0	55	**91.0**	61	100.0
DEF-NP	SV	15	38.0	24	62.0	39	100.0
	VS	3	12.0	22	**88.0**	25	100.0

First, the overwhelming distribution of the high-continuity referent-coding devices, zero and unstressed clitic pronouns, in paragraph-medial contexts – **99%–100%** – demonstrates vividly how referential and thematic continuity march hand in hand.

Second, both independent subject pronouns and full subject NPs placed post-verbally (VS) appear much more frequently in the paragraph-medial contexts of high thematic continuity – **88%–91%** – than pre-verbal subject NPs (SV; 62%–66%). This again underscores the fact that referential and thematic continuity march in tandem.

2.5.6.3 Word-order and referential continuity in Early Biblical Hebrew[19]

Early Biblical Hebrew (EBH) is a rigid VO language with the pre-verbal position (SV, OV) reserved for **discontinuous referents**. This word-order device interacts with the tense-aspect system, so that more continuous full-NP referents, overwhelmingly post-verbal (VS, VO), tend to appear in clauses marked by the *perfective* (prefixal) conjugation. In contrast, discontinuous full-NP referents, most commonly pre-verbal (SV, OV), tend to appear in clauses marked by the *perfect* or *imperfective* conjugations. As an example, consider the opening episode of *Genesis*. The first 4 clauses (49a,b,c,d) introduce new referents in rapid succession, first in *perfect*-marked clauses (49a,b), then the non-verbal (49c), then the *imperfective* (49d):[20]

(49) a. bɨ-re'shit   bara'   'elohim 'et-ha-shamayin
           at-beginning create/**PERF**/3sm God   **ACC**-the-heaven
           we-'et-ha-'arets,   (ADV-V)
           and-**ACC**-the-earth
           'In the beginning God created the heaven(s) and the earth,

      b. we-ha-'arets   hay-ta   tohu   va-vohu,   (S-V)
           and-the-earth be/**PERF**-3sf chaos and-confusion
           and the earth was all chaos and confusion,

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19. The description of Early Biblical Hebrew grammar here is taken from Givón (2015a, ch. 9).

20. The first clause is a *presentative* construction, fronting the time adverb 'in the beginning' and precipitating subject post-posing (OVS or TVX; see Vennemann 1973).

c. wi-ḥoshekh ʕal pney   ha-tɨ'om,   (S-V)
    and-darness on   face/of the-precipice
    and darkness over the precipice,

d. wi-ruaḥ   'elohim mɨraḥf-et   ʕal pney   ha-mayim;
    and-spirit/of God   hover/**IMPFV**-sf on   face/of the-water
    and the spirit of God (was) hovering over the water;   (S-V)

Once the scene has been set, the continuous narrative with a recurring referent switches to the VS order and the *perfective* tense-aspect:

(50) e. wa-yo-'mar   'elohim: yɨ-hi   'or!,   (V-S)
         and-3sm-say/**PFV** God   3sm-be/**IRR** light
         and God said: "Let there be light!",

f. wa-yɨ-hi   'or;   (V-S)
    and-3sm-be/**PFV** light
    and there was light';

g. wa-ya-r'   'elohim 'et-ha-'or ki-ṭov   (V-S)
    and-3sm-see/**PFV** God   **ACC**-light **SUB**-good
    and God saw that the light was good,

h. wa-ya-vdel   'elohim beyn   ha-'or   u-veyn
    and-3sm-divide/**PFV** God   between the-light and-between
    ha-ḥoshekh,   (V-S)
    the-dark
    and God divided the light from the dark,

i. wa-yi-qra'   'elohim l-a-'or   yom,   (V-S)
    and-3sm-call/**PFV** God   to-the-light day
    and God named the light day,

Next, a new object is contrasted with the preceding object, precipitating a switch to the OV order and the *perfect* tense-aspect:

(51) j. wi-l-a-ḥoshekh qara'   layla;   (O-V)
         and-to-the-dark call/**PERF**/3sm night
         and the dark he named night;

After which the episode closes with the continuous *perfective* mode once again, with VS order, even with the two subjects ('evening', 'morning') being new – though unimportant:

(52) k. wa-yɨ-hi   ʕerev   (V-S)
        and-3sm-be/**PFV** evening
        and there came the evening,

  l. wa-yɨ-hi   boqer   yom 'eħad.   (V-S)
        and-3sm-be/**PFV** morning day   one
        and there came the morning of day one'. (Genesis, 1:1–5)

Table (53) below summarizes the frequency distribution of the main tense-aspect conjugations in two EBH books (*Genesis*, *Kings-II)*. The prefixal conjugation, strongly associated with the VS word-order, is a merger of the *perfective* and *irrealis* tense-aspects, both used to carry the bulk of in-sequence new information, the **foregrounded backbone** of the narrative. The suffixal conjugation, strongly associated with the SV word-order, carries mostly the *perfect* tense-aspect function, some of it with a *subjunctive* use (see further below). The nominal/participial conjugation, rather infrequent in the text, carries the *imperfective* tense-aspect function, and is also strongly associated with the discontinuous SV word-order.[21]

(53) **Overall frequency distribution of tense-aspects in EBH**

tense-aspect	Genesis		Kings-II	
	N	**%**	**N**	**%**
prefixal	480	**69.7%**	912	**74.8%**
suffixal	181	26.2%	209	17.8%
imperfective	28	5.1%	98	7.4%
TOTAL:	689		1,219	

As is to be expected, the prefixal conjugation, strongly associated with referential and thematic continuity, comprises **70%–75%** of the total sample.

Consider now the numerical association, given in Table (54) below for the *Genesis* text, between the tense-aspect conjugations and word-order.

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21. See again Givón (2015a, ch. 9), as well as Hopper (1979).

(54) **Subject position and tense-aspect in Genesis**

	tense-aspect conjugation					
	prefixal		suffixal		imperfective	
category	VS	SV	VS	SV	VS	SV
Main clause:						
no fronted non-S	**168**	/	**1**	21	5	**76**
fronted non-S	/	/	**13**	/	2	**16**
PRO-obj	9	/	/	/	/	/
PRO-subj	/	5	/	4	3	**21**
negative	4	/	1	/	1	2
irrealis	8	7	3	/	/	/
total main clause	**189**	12	18	**25**	11	**115**
%	**94.0%**			**58.1%**		**91.1%**
Subordinate clause:						
OBJ-REL-clause	2	/	12	/	/	/
ADV/V-COMP	2	1	13	/	12	1
OBJ-WH-question	2	/	1	/	/	/
total subord. clause	**6**	1	**26**	/	**12**	1
%	**85.7%**		**96.2%**		**92.3%**	
TOTAL:	**195**	13	**44**	25	23	**116**
%	**93.7%**		**63.7%**			**83.4%**

The main facets of the association between tense-aspect and word-order in EBH may be summarized as follows:

- In main clauses marked by the *prefixal* (mostly *perfective*) conjugation, **94.0%** of the full-NP subjects come in the **VS** word order.
- In contrast, in main clauses marked by the *suffixal* (mostly *perfect*) conjugation, **58.1%** of the full-NP subjects come in the **SV** order. The figure is even higher in the *nominal/particpial* (*imperfective*) conjugation – **91.1%** SV.
- In subordinate clauses, which constitute a much smaller part of the sample and tend to code discontinuous backgrounded information, the SV word order predominates in all three conjugations (85.7%, 96.2%, 92.3%).

2.6   Cataphoric aspects of topicality

2.6.1   Methodological preliminaries

The notion of 'topic' has been rather murky in linguistics. The Prague School tradition (Firbas 1966, 1974; Bolinger 1954; Halliday 1967; Kuno 1972; *inter alia*) saw the clause as divided into two parts, a topic (Aristotle's 'theme') and non-topic (Aristotle's 'rheme'), but proposed no grammar-independent tests for topicality. The 'theme' was said to be the element that is 'talked about', 'old information', 'presupposed' or 'given', displaying 'communicative dynamism', or the 'focus of empathy' in 'functional sentence perspective'.

The subsequent functionalist literature of the 1970s concentrated primarily on the old-information ('given', 'presupposed', 'accessible') aspects of topicality, noting how it correlated with grammatical phenomena such as definiteness, anaphoric pronouns, zero anaphora, L- and R-dislocation, or Y-movement; or with semantic notions such as referentiality or individuation (Hawkinson and Hyman 1974; Keenan 1976a; Givón 1976; Timberlake 1978; *inter alia*).

The text-based work that has been our point of departure in this chapter has attempted to distinguish between *two* quantifiable aspects of topicality, one assessed by anaphoric heuristic measures, the other by cataphoric ones:[22]

- **Anaphoric**: the referent's accessibility, measured heuristically in text as the **anaphoric distance** (AD) between the current occurrence of a referent and its nearest previous occurrence. Presumably, such a heuristic measure correlates with the referent's **cognitive accessibility** in either current attention, working memory or episodic memory.
- **Cataphoric**: the referent's importance, measured heuristically as the **cataphoric persistence** (CP) of the referent in the 10 clauses subsequent to its current occurrence. Presumably, such a text-based heuristic measure correlates with the referent's **importance**, thus **attentional activation** or **cognitive anticipation**.

In the preceding sections of this chapter we dealt with grammatical constructions that are sensitive, primarily, to the anaphoric aspect of reference. In the subsequent two sections, we will note two constructions that are sensitive primarily to the cataphoric aspect of reference – indefinite NPs and pragmatic voice. One must note, however, that an absolute separation between the

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22. Givón (1988; ed. 1994; ed. 1997a).

anaphoric and cataphoric functions of referent-coding devices is not feasible. Thus, for example, L-dislocation was discussed above in terms of its large anaphoric distance (AD), thus referential discontinuity; but it is also used to re-introduced **important** referents back into the discourse after a considerable gap of absence (high AD measure), thus referents that will also display considerable cataphoric persistence (high CP measure).[23]

2.6.2   Indefiniteness and cataphoric topicality

2.6.2.1 The semantics of reference[24]

In the logical tradition (Frege 1892; Russell 1908; Carnap 1956, 1959), reference is a mapping relation between linguistic expressions and the Real World (RW), whereby the contrast between (55a) and (55b) below is said to be whether their definite subject refers (55a) or does not refer (55b) to an entity in the Real World; and likewise the contrast between the indefinite object in (55c) and the one in (55d):

(55)   a.   The queen of England is bald.
     b.   The king of France is bald.
     c.   Yesterday I saw a deer in the woods.
     d.   Yesterday I saw a unicorn in the woods.

How come, then, natural languages fail, repeatedly, to mark this profound difference with an appropriate grammatical device? How come the grammar of natural languages seems to accord the same treatment to the mundane (55a,c) and the otherworldly (55b,d)? Natural language's glaring indifference to Real-World reference suggests that linguistic expressions are not meant to map onto referents in the Real World, but rather onto referents in the **Universe of Discourse**. And as every fiction lover knows, one may choose one's Universe of Discourse to either correspond or not correspond to the proverbial RW.

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23. In the same vein, chain-medial devices that signal cataphoric switch-reference in the grammar of clause-chaining tend to introduce – or re-introduce – into the discourse important referents (Givón 2017, ch. 11).

24. This section draws on materials discussed earlier in Givón (1981b, 1984) and Wright and Givón (1987). The earlier papers acknowledged my indebtedness to Erica García, Dwight Bolinger, Edith Moravcsik, Joseph Greenberg, Joan Kahr, Meritt Ruhlen, Gad Ben-Horin, Amnon Gordon, Haj Ross, Derek Bickerton and Ian Hancock. A more expanded discussion is found in ch. 8 below.

Upon closer inspection, the notion Universe of Discourse needs to be modified somewhat, so as to account for the fact that speakers have a choice – in well-defined contexts – whether a linguistic expression is *meant to* refer or *not meant* to refer in the currently-constructed Universe of Discourse. And further, one needs to also account for the fact that our referential options are severely constrained by the propositional modality of the clause within which the referring expression is lodged, an insight we owe to W. Quine (1953).[25] The contrast between intending and not intending a linguistic expression to refer is best illustrated with indefinite referents under the scope of either *realis* or *irrealis* modality:[26]

(56) a. **Realis**:
    I saw a doctor yesterday
    i. ⊃ I have a specific one in mind
    ii. *⊃ I don't have a specific one in mind
  b. **Irrealis (future tense)**:
    I'm going to see a doctor tomorrow
    i. ⊃ I have a specific one in mind
    ii. ⊃ I don't have a specific on in mind
  c. **Irrealis (intentional auxiliary)**:
    I wanted to see a doctor
    i. ⊃ I have a specific one in mind
    ii. ⊃ I don't have a specific one in mind
  d. **Irrealis (intentional main verb)**:
    I imagined a doctor standing there
    i. ⊃ I have one in mind
    ii. ⊃ I don't have one in mind
  e. **Irrealis (negation)**:
    I didn't see a doctor
    i. *⊃ I have one in mind
    ii. ⊃ I don't have one in mind
  f. **Nominal predicate**:
    i. He is a doctor I met last year.   (⊃ focus on token)
    ii. He is a doctor.   (⊃ focus on type)

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25. For the original treatment, see Givón (1973a). Logicians eventually handled this by developing a *Logic of Possible Worlds* (Lewis 1986; Divers 2002); see further discussion in ch. 8.

26. Definite referents entail prior introduction into the Universe of Discourse and thus, in most contexts, a referring interpretation.

As can be seen, an *irrealis* modal scope may be cast over a proposition by grammatical operators (56b,e), by an auxiliary verb (56c), or by the intentional main verb itself (56d), though the vast majority of verbs in the language are non-intentional (thus 'implicative'), casting *realis* scope over their objects, as do the past or present tenses.[27]

The same effect of propositional modality can be seen, even more clearly, in a language that does not mark the contrast between definite vs. indefinite, but rather between referring and non-referring NPs. As illustration, consider Bemba, where the vcv-noun prefix marks **referring** nominals, either definite or indefinite, while the cv-noun prefix marks **non-referring** indefinites:[28]

(57) a. **Realis**:
      i. **REF**:
         umuana a-a-somene **ichi**-tabo
         child   3s-PA-read **vcv**-book
         'the child read **a/the** book'   (⊃ I have one in mind)
      ii. ****NREF**:
         *umuana a-a-somene **chi**-tabo
          child   3s-PA-read **cv**-book
   b. **Irrealis (future)**:
      i. **REF**:
         unu-ana a-ka-soma   **ichi**-tabo
         child   3s-FUT-read **vcv**-book
         'the child will read **a/the** book'   (⊃ I have one in mind)
      ii. **NREF**:
         umuana a-ka-soma   **chi**-tabo
         child   3s-FUT-read **cv**-book
         'the child will read **some** book   (⊃ I don't have one in mind)

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27. Propositional modality does not appear to interact with the contrast between referring vs. non-referring nominal predicates (56f), which thus appear to be constitute a special case here.

28. Bemba was thus an ideal vehicle for teasing apart reference from both definiteness and indefiniteness (Givón 1973a,b).

c. **Irrealis (negation):**
  i. REF:
     umuana ta-a-a-somene   **ici**-tabo
     child   NEG-3s-PA-read **vcv**-book
     'the child didn't read **the** book'   (⊃ I have *that one* in mind)
  ii. NREF:
     umuana t-a-a-somene   **chi**-tabo
     child   NEG-3s-PA-read **cv**-book
     'the child didn't read **any** book'   (⊃ I don't have one in mind)

English, it appears, marks definiteness explicitly but fudges over the reference status of indefinite nouns. Bemba, on the other hand, marks reference explicitly but fudges over marking the definiteness status of referring nouns. But in both, the reference of NPs pertains to some pre-specified Universe of Discourse.

The relation between reference and propositional modality may be summarized as follows, with (58a) below being the special case, (58b) the default case, and (58c) accounting for the special pragmatic status of negation:[29]

(58) a. Under *irrealis* scope, a noun phrase can be either referring or non-referring.
     b. Under *realis* scope, a noun phrase can only be referring.
     c. A referring noun phrase under the scope of *negation* can only be definite.

But how about languages – Creoles, Modern Hebrew, Turkish, Mandarin Chinese and many others – where the indefinite marker 'one' is optional? What does the contrast between 'one'-marked and zero-marked indefinite NPs under *realis* scope signal in such languages?

When Bickerton (1975) described the use of the numeral 'one' as indefinite markers in Creoles, it appeared – in isolated, out-of-context clauses – to code the *semantic* contrast between referring and non-referring nouns, abiding by

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29. In both English (56e) and Bemba (57c), indeed universally, a *referring-indefinite* interpretation is barred under the scope of negation. vcv-marked referring nouns in Bemba, which are ambiguous as to their definiteness in other modal contexts, must be interpreted as *definite* in negative clauses. This has to do with the special pragmatic status of negative assertions, which are not used to introduce new information but rather to deny previously-asserted information (see ch. 3).

generalization (58) above. Thus, in Hawaii English Creole; (Bickerton 1975, 1981; Bickerton and Odo 1976b):

(59)   a.   **Realis scope**:
    i.   **REF**:

      i   rid   **wan** buk
      he read/PA **one** book
      'he read a book'   (⊃ I have one in mind)

    ii.   *NREF:

      i   rid   book   (⊃ I have no particular one in mind)
       he read/PA book

   b.   **Irrealis scope**:
    i.   **REF**:

      i   go rid   **wan** buk
      he IRR read **one** book
      'he will read a book'   (⊃ I have one in mind)

    ii.   **NREF**:

      i   go rid buk
      he IRR read book
      'he will read some book   (⊃ I have no particular one in mind)

   c.   **Negation scope**:
    i.   ***REF**:

      *i   no   rid   **wan** buk
       he NEG read/PA **one** book

    ii.   **NREF**:

      i   no   rid   buk
      he NEG read/PA book
      'he didn't read any book'

In the subsequent sections, I will suggest first that in languages like Creoles, Hebrew or Mandarin Chinese, where the development of the numeral 'one' as indefinite marker is in its early stage, 'one' marks only **referring** indefinites. And that languages such as English, German or French represent a later stage, where the numeral 'one' has generalized to all indefinites, referring as well as non-referring. And further, that the recent development of 'this' as an indefinite marker in spoken English represents the very same early stage as the numeral 'one' in Creoles, Mandarin and Hebrew. And lastly, that the notion of 'referring' that is relevant in the early development of indefinite markers is not the s*emantic* notion of 'having a particular referent in mind', but rather the *pragmatic* notion of the new referent being **important** or **topical** in the subsequent discourse.

2.6.2.2 The numeral 'one' as an indefinite marker in Modern Hebrew

The use of the numeral 'one', *'eħad*, in its reduced unstressed suffixal form -*ħad*, is found only in the colloquial register of Israeli Hebrew, and is virtually unattested in high-brow written texts. As in the case of Creoles, the use of 'one' to mark indefinite NPs in Hebrew is the product of first-generation native speakers whose parental input was highly pidginized (Bickerton 1975, 1981).

When one considers out-of-context verbal clauses, colloquial Hebrew seems to behave almost like the Creole in (59) above. However, *both* zero-marked and 'one'-marked object nouns are accepted under *realis* scope. Both are interpreted as semantically referring in the Universe of Discourse. And under negative scope, 'one'-marked indefinites are unacceptable. Thus compare (Givón 1981b):

(60) a. **Realis, zero-marked indefinite**
        qani-ti   sham sefer
        buy/PA-s there book
        'I bought a book there'   (⊃ I have one in mind)

    b. **Realis, 'one'-marked indefinite**:
        qani-ti   sham sefer-**ħad**
        bought/PA-1s there book-**one**
        'I bought a book there'   (⊃ I have one in mind)

    c. **Irrealis, zero-marked**:
        ani 'e-qne   sefer sham
        I   1s-buy/IRR book there
        'I'll buy a book there'   (⊃ I don't have one in mind)

    d. **Irrealis, 'one'-marked**:
        ani 'e-qne   sefer-**ħad** sham
        I   1s-buy/IRR book-**one** there
        'I'll buy a book there'   (⊃ I have one in mind)

    e. **Negation, zero-marked**:
        lo'   qani-ti   sefer sham
        NEG buy/PA-1s book there
        'I *didn't* buy a book there'   (⊃ I don't have one in mind)

    f. *****Negation, 'one'-marked**:
        *lo' qani-ti   sefer-**ħad** sham
        NEG but/PA-1s book-**one** there

    g. **Negation, definite**:
        lo'   qani-ti   **et-ha**-shefer   sham
        NEG buy/PA-1s **ACC-the**-book there
        'I didn't but the book there'   (⊃ I have that one in mind)

    h. **Nominal predicate, zero-marked**:
        ze sefer
        it   book
        'It's a book'   (Context: What is it you've got there?)

    i. **Nominal predicate, 'one'-marked**:
        ze sefer-**ħad** she-kani-ti   etmol   ve-…
        it book-**one** REL-buy/PA-1s yesterday and-
        'It's a book I bought yesterday and…'
                         (Context: What's that book you've got there?)

The final contrast, in nominal predicates, between the non-referring response (60h) and the referring (60i), does not necessarily involve having vs. not having a specific referent in mind, but rather intending the reference to be about the generic *type* (60h) vs. a specific *token* (60i).

    But what is the difference between (60a) and (60b) above, both involving a *semantically*-referring object? The difference turns out to involve the pragmatics of *topicality/importance*, and can only reveal itself in the appropriate discourse context. As an illustration, consider the two scenarios of book-buying (61a) and (61b) below:

(61) a. **Zero-marked indefinite**:
      …'az kshe-gamar-ti   le-'ekhol, yatsa'-ti   l-a-reħov
         so when-finish/PA-1s to-eat   go.out/PA-1s to-the-street

      ve-qani-ti   **sefer**, ve-'az   ħazarti   ha-bayt-a
      and-buy/PA-1s **book** and-then return/PA-1s the-house-ALL

      ve-hit-raħats-ti   ve-halakh-ti   li-shon…
      ve-REFL-wah-1s and-go/PA-1s to-sleep

      '… so after I finished eating, I went out to the street and bought a book, and then I went back home and took a shower and went to sleep…'

    b. **'One'-marked indefinite**:
      …'az kshe-gamar-ti   le-'ekhol, yatsa'-ti   l-a-reħov
         so when-finish/PA-1s to-eat   go.out/PA-1s to-the-street

      ve-qani-ti   **sefer-ħad** ve-ħazarti   ha-bayt-a
      and-buy/PA-1s **book-one** and-return/PA-1s the-house-ALL

      vehitħal-ti   li-qro'   'ot-**o**,   ve-**ze** haya
      and-start/PA-1s to-read ACC-**3sm** and-**it** be/PA/3sm

      sefer fantasti
      book fantastic

      '… so after I finished eating, I went out to the street and bought this book and went back home and started reading it, and it was a fantastic book…'

The zero-marked 'book' in (61a) is not of much interest to the speaker; its individual identity hardly matters; it is mentioned once and then dropped out of the narrative. In contrast, the specific identity of the 'one'-marked book in (61b) mattered a lot, as evidenced from its persistence in the subsequent discourse. It remains *topical*.

For rather mundane reasons, I have no access to recordings of the colloquial low-register Israeli Hebrew, and the use of the de-stressed numeral 'one' as an indefinite marker is hard to find in the written register. The constructed contexts in (61a,b) above are thus merely suggestive. Fortunately, the pragmatics of reference can be tested in Creole languages, where the colloquial register predominates.

2.6.2.3 The numeral 'one' as an indefinite marker in Krio

Krio is an English-based Creole spoken in and around Freetown, Sierra Leone. A collection of recorded oral texts exists (Hancock ed. 1972), and our study here drew on several texts from that collection. Definite referents are marked in Krio by either *di* 'the' or *da* 'that'. As in all Creoles, indefinite referents are marked by either zero or 'one', and conform, in out-of-context clauses, to the Creole usage noted in (59) above. As an example, consider the short text in (62) below, a joke.[30]

(62) **Krio story #1**
a. wan-dey-ya, **tu pikin** den graní   sén denh na
    one-day-here **two boys** their grandma sent them LOC

    wan-**mamí**   inh sháp
    one-**woman** her shop

    'One day, the grandma of two boys sent them to this woman's shop

b. fo gó bai **kámfoh**; wey   denh rích déy, di mamí
    for go buy **camphor** when they reach there the woman

    ask   denh
    asked them

    to buy some camphor; when they got there, the woman asked them

c. weytin   denh kam foh; na-déy   di pikín-denh
    what-thing they came for TOP-they the-children-them

    séy dey don-fogét;
    said they done-forget

    what they came for; so then the children said they had forgotten;

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30. The Krio transcription used here follows Hancock (ed. 1972).

d. di mamí   kól   ol   di tíng   na   di   sháp,   **ówri**,
   the woman call all the thing LOC the shop **butter**

   simínji, etc.,
   clove   etc.

   so the woman mentioned all the things in the shop,

e. denh tíl no   mémba, di pikín-denh   jís   dey-séy,
   they still NEG remember the chilcren-them just there-say
   but the children still couldn't remember, they just kept saying,

f. denh kám   foh…   dehn kám foh…   na-ính   di
   they came for   they came for   TOP-him   the

   mamí   táya,
   woman tired

   they came for… they came for… well the woman got tired,

g. en   mék denh go ówm en   ásk denh graní
   and make them go home and ask their grandma

   wey-ting   denh kám foh;
   what-thing they came for

   and made them go home and ask their grandma what they came
   there for;

h. as dey gó ówm nomóh, na-inh   **wán di**
   as they go home no-more TOP-him **one the**

   pikín   mémba,
   chidren remembered

   so as they go back home, one of the children remembered,

i. en   rón gó bák na-di   sháp en séy: "Na-kámfoh
   and ran go back LOC-the shop and said TOP-camphor

   wi kám foh, má!"
   we came for ma'ame

   and ran back to the shop and said: "It's for camphor that we came
   for, Ma'ame!"

The referents introduced into the discourse as numeral-marked indefi-nites – the boys marked by 'two' (62a) the woman marked by 'one' (62a) and 'one of the boys' (62h) – are the topical participants that persist through the story. The other indefinite referents, whether 'camphor' (62b) that reappears only once in the punch-line(62i), or 'butter' and 'clove' (62d), never recur in the subsequent discourse and are zero-marked. The quantified summary of

the recurrence of indefinite referents following their first introduction into the discourse is given in Table (63) below.[31]

(63)   **Recurrence of indefinite referents in Krio Story #1**

referent	semantic status	pragmatic status	# of recurrences
two-boys	REF	major topic	17
one-woman	REF	major topic	5
one-boy	REF	major topic	2
camphor	NON-REF	minor topic	1
butter	NON-REF	minor topic	0
cloves	NON-REF	minor topic	0

The summary of the recurrence of 'one'-marked vs. zero-marked indefinites in two longer stories is given in Tables (64) and (65) below. In story #2, one major participant was a mass noun, marked with the quantifier 'plenty' upon first introduction into the discourse and then recurring 17 more times. In story #3, two major participants were plural, marked with the numeral 'three' upon first introduction and then recurring a total of 13 times (2 and 11).

(64)   **Recurrence of indefinite referents in Krio story #2**

marking	# of referents	pragmatic status		semantic status		total recurrence	average
		major	minor	REF	NREF		
'one' or 'plenty'	4	4	/	4	/	105	26.2
zero	12	/	12	3	9	/	0.0

(65)   **Recurrence of indefinite referents in Krio story #3**

marking	# of referents	pragmatic status		semantic status		total recurrence	average
		major	minor	REF	NREF		
'one' or 'three'	8	8	/	8	/	113	14.1
zero	6	/	6	3	3	4	0.6

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31. For full detail see Givón (1984).

The correlation between marking by 'one' (or a plural quantifier), pragmatic status as major participant, and frequency of recurrence in the subsequent text is striking. And while all 'one'-marked indefinites are semantically referring, between 1/3 (story #2) and 1/2 (story #3) of zero-marked indefinites are also semantically referring. The marking by 'one' thus signals the *pragmatic* status of the indefinite referent as an important – topical, major – participant, one likely to recur in the subsequent discourse.[32]

2.6.2.4 The demonstrative 'this' as an indefinite marker in English

Much like the indefinite-marking numeral 'one' in Hebrew, the use of the demonstrative 'this' to mark indefinites in English is confined, so far, to the spoken register of younger or less-educated people. In the old days when Jean Phillips used to write as Dear Abby, one could occasionally find in her columns letters written in this register. Here is a particularly heart-rending one from sometime in the mid-1970s:

(66) "Dear Abby: There's **this guy** I've been going with for near three years. Well the problem is that he hits me. He started last year. He has done it only four or five times, but each time is was worse than before. Every time he hits me it was because he thought I was flirting (I wasn't).

  Last time he accused me of coming on to **a friend** of his. First he called me a lot of dirty names, then he punched my face so bad it left me with **a black eye** and **black and blue bruises** over half of my face. It was very noticeable, so I told my folks that the car I was riding in stopped suddenly and my face hit the windshield. Abby. He's 19 and I'm 17, and already I feel like **an old lady** who lets her husband push her around. I haven't spoken to him since this happened. He keeps bugging me to give him one more chance. Should I keep avoiding him or what? Black and Blue".

One semantically-referring participant in the narrative (66) is introduced with the indefinite article 'this'. It recurs 16 times in the subsequent discourse. Four other referents are introduced as indefinites, three with the indefinite article

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32. Similar quantitative results have been reported for 'one'-marked vs. zero-marked indefinites in Mandarin Chinese (Huang 1985); see summary in Wright and Givón (1987).

'a(n)' (historically 'one'), one a zero-marked plural. Three of them are seman-
tically referring and one ('an old lady') non-referring. None of them recur, not
even once, in the subsequent text.

 To test the role of the indefinite 'this' a bit more systematically, Suzanne
Wright, my collaborator, elicited and recorded spoken narratives from six native-
speaking subjects ages 8–10 years. Four recording sessions produced texts with
a total of 800 verbal clauses, with 107 indefinites marked by 'a(n)' and 43 by
'this', 150 in all. A sample out of one of the stories is given in (67) below, broken
into its verbal clauses (Wright and Givón 1987):

(67) a. Ya know **this kid** ya know,
   b. he was walking in the forest,
   c. an' he saw **this great big bear**,
   d. and it was, it was taking **big bites** out of **a tree**;
   e. he was scared, and then,
   f. and then, and then he came to the bear
   g. and, he tapped on the, little bottom,
   h. and he says,
   i. [….] growl,
   j. and he says,
   k. who's behind me?
   l. uh uh, I am, uh uh, I'm just **a little boy**, yeah,
   m. mm. I wish you lived with me nn.
   n. I'm **a nice bear**…

After being first introduced as indefinite in (68a), one of the two main partici-
pants ('this kid') recurs 5 times in the next 10 clauses. The second main partici-
pant, introduced as 'this great big bear' in (68c), recurs 5 times in the subsequent
10 clauses. Of the other three indefinite referents, the referring 'a tree' does not
recur, nor do the non-referring (attributive) 'a little boy' and 'a nice bear'.

 We subjected the recorded texts to the Cataphoric Persistence (CP) measure
developed earlier (Givón ed. 1983), and divided the 150 indefinite referents into
two groups: those that were marked by 'this' and those that were marked by
'a(n)'. We also noted for each indefinite referent whether it appeared as subject
or non-subject in the clause. The average CP values for all four categories are
summarized in Table (68) below.

(68) **Frequency distribution of 'this'- and 'a(n)'-marked indefinites, their grammatical roles and average CP values**

marking	subject			non-subject			TOTAL		
	N	%	ave. CP	N	%	ave. TP	N	%	ave. CP
'this'	28	65%	**6.25**	15	35%	**2.40**	43	100%	**5.25**
'a(n)'	13	12%	**1.54**	94	88%	**0.56**	107	100%	**0.68**

Both marking indefinite NPs with 'this' and assigning them the subject case-role correlate strongly with cataphoric persistence in the subsequent discourse.[33] What is more, the two features are strongly correlated – 65% of 'this'-marked indefinites are introduced as subjects, most commonly in existential-presentative clauses (67a); while 88% of 'a(n)'-marked indefinites are introduced as non-subjects. The overall average CP values for indefinites marked by 'this' vs. 'a(n)' – 5.25 vs. 0.68, respectively – naturally reflects the correlation between 'this'-marking and subjecthood.

Much like the numeral 'one', 'this' is introduced into the indefinite paradigm as a marker of *pragmatically prominent* indefinites, marking upon first introduction those referents that are going to be important or topical – thus persistent in the subsequent discourse. The expansion of the functional scope of indefinite markers to *general indefinites* marking new or inaccessible referents (as in modern English, French or German) is a later development in the history of indefinite marking.

2.7 Voice constructions and cataphoric topicality

2.7.1 Anaphoric vs. catephoric zero

As noted earlier above, zero anaphora is prominently involved in marking maximally-continuous referents, those whose antecedent can be found in the preceding clause, and whose characteristic anaphoric distance (AD) measure is thus 1. The communicative and cognitive logic of using an anaphoric zero to mark nominal referents may be summarized as follows:

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33. The correlation between subjecthood and topic persistence was described earlier by Zubin (1979).

(69) **Anaphoric zero and topic predictability:**
   a. **Communicative**: Predictable information can be left unmarked.
   b. **Cognitive**: Information that is already activated under current focal attention requires no re-activation.

In this section we will discuss the zero-marking of subject and object NPs that is motivated by the other communicative principle of referential coherence, that of **topicality** or **importance**. The communicative and cognitive logic implicated here may be summarized as:

(70) **Cataphoric zero and topic importance:**
   a. **Communicative**: Unimportant information, one that is not expected to persist in the subsequent discourse, can be left unmarked.
   b. **Cognitive**: A heightened state of alertness or anticipation needs to be maintained only for important information that is expected to persist.[34]

It is easy to see the fundamental affinity between the cataphoric principles (70a,b) and their anaphoric counterparts (69a,b), respectively. Communicatively, zero-marking signals **informational continuity** either anaphorically (69a) or cataphorically (69a). Cognitively, zero-marking signals **continued attentional activation** either anaphorically (69b) or cataphorically (70b). It is thus not an accident that the most common clause-type in natural discourse is the chain-medial clause, with both anaphoric and cataphoric referential continuity and zero-marked referent(s) (DuBois 1987).

One of the most conspicuous grammar-coded domains where cataphoric zeros manifest themselves is the mega-domain of **pragmatic voice**, most commonly in two core de-transitive voice constructions – passive and anti-passive. We will begin the discussion with a brief recapitulation of the functional domain of voice.

2.7.2 The functional domain of pragmatic voice

The grammar-coded domain of voice may be divided into two sub-domains, semantic and pragmatic. Semantic voice constructions, such as reflexive, reciprocal or middle-voice, are defined in terms of relations between the agent and patient *within* the atomic verbal clause. The clause's discourse context is not

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34. For an extensive review of the neuro-cognitive literature on default minimal alertness vs. anticipation of change, see Fan *et al.* (2007).

implicated in motivating the use of these constructions, and they will not concern us here.[35]

At its core, pragmatic voice involves the **relative topicality** of the two core participants in the transitive event, agent and patient. The four main pragmatic voice constructions are defined functionally in such terms, as in (Cooreman 1982, 1987, 1988; Givón 1994):

(71)   **Relative topicality of agent and patient
in the four main voice constructions:**

voice	relative topicality
a. Active-transitive:	AGT > PAT
b. Inverse:	PAT > AGT
c. Passive:	PAT >> AGT
d. Antipassive:	AGT >> PAT

The active-transitive ('direct') clause is thus one in which both core participants are topical, but the agent outranks the patient. The inverse clause is one in which both core participants are topical, but the patient outranks the agent. The passive clause is one where the agent is radically de-topicalized (Shibatani 1985). And the antipassive clause is one where the patient is radically de-topicalized (Silverstein 1972; Heath 1976).

The four pragmatic voice constructions have a characteristic frequency distribution in natural discourse, whereby the active-transitive ('direct') clause is by far the most common, and the three de-transitive clauses are much less frequent. As an illustration, consider the frequency distribution of the four voice constructions in Chamorro oral narrative (Cooreman 1982,1987, 1988):[36]

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35. In active-transitive events, the agent acts to change the patient. In the middle-voice, the patient changes without an agent. In the reflexive, the agent acts upon itself and is thus co-referential with the patient. In the reciprocal, two different agents act upon each other reciprocally. None of these variations implicate the discourse context outside the atomic event-clause. One may argue that an anaphoric zero, or its pronominal equivalent, is involved in all three semantic de-transitive voice constructions: zero agent in the middle-voice clause, and zero patient in the reflexive and reciprocal. For further discussion of semantic vs. pragmatic voice, see Givón (2001, chapter 13), Shibatani (2006).

36. Comparable distributions in other languages can be found in the various studies in Givón (ed. 1994).

(72) **Frequency distribution of voice constructions
      in Chamorro narrative (Cooreman 1987)**

voice	N	%
active/ergative	601	**72.0**
inverse	134	16.1
passive	35	4.2
antipassive	64	7.7
total:	834	100.0

As noted above, the heuristic measure of cataphoric persistence (CP) is a reliable way of assessing the topical importance of referents, in the case of voice constructions comparing subject and object NPs.[37] As an illustration, consider the differential cataphoric persistence of agents and patients in the four voice constructions in Karao (Philippine; Brainard 1994), expressed in terms of the percent distribution of referents persisting 0–2 times vs. those that persist more than 2 times in the subsequent 10 clauses.

(73) **Percent distribution of cataphoric persistence of agents and patients
      in Karao voice constructions (Brainard 1994)**

construction	% in agent		% in patient	
	TP 0–2	TP >2	TP 0–2	TP >2
active-transitive	37.8	**62.2**	63.9	**36.1**
inverse	76.4	**23.6**	0.0	**100.0**
passive	97.6	**2.4**	54.8	**45.2**
antipassive	0.0	**100.0**	92.9	**7.1**

The agent is more persistent – thus more topical – in the active-direct clause, and even more so in the antipassive clause, where the patient is radically demoted. The patient is more persistent in the inverse or the passive, where the agent is, respectively, either less topical or radically demoted.

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37. See various studies in Givón (ed. 1994). The relation between the referent's cataphoric persistence in text and its topicality/importance is an asymmetrical one-way conditional: "If persistent in text, then important; but not necessarily vice versa". Fundamentally, importance is a psychological property correlated with multiple factors, only one of them being text frequency.

2.7.3　Cataphoric zero in passive clauses

2.7.3.1　Prelude: Typology and functional domains

As noted in ch. 1, above, the typology of any grammar-coded domain starts with the enumeration of all the diverse grammatical structures that can code the **same functional domain** cross-linguistically (Givón 1981a). Since each of those structures arises from a different diachronic source and via a distinct diachronic pathway, syntactic typology is fundamentally a **diachronic** enterprise (Greenberg 1978, 1979; Givón 2015a,b). In this section we will survey the diachronic typology of passive clauses, returning to the six major structural types discussed in ch. 1, above, whose diachronic provenance is fairly well established. Of special interest in each case will be the natural source of the zero that marks the de-topicalized agent.

As noted above (71), the functional definition of the passive domain is (Shibatani 1985):

(74)　**Functional definition of the passive-voice domain:**
　　　"A passive clause is one where the agent of the corresponding active is radically de-topicalized. By default, another argument may then assume the role of main topic".

It is of course not an accident that the most common, natural device for marking the demoted agent-of-passive is plain **zero**. This follows from communicative principles (69a) and (70a) above. Our diachronic typology of passive clauses, given originally at the end of ch. 1, above, is thus, in an obvious way, also a typology of the various diachronic pathways that lead to zero-marking of the demoted agent in the passive clause, as well as the specific diachronic source-constructions of such zeros.

Passive clauses may be divided into two major structural types – promotional and non-promotional. In the **promotional passive**, the remaining default topical argument assumes the subject/nominative grammatical role. In the **non-promotional passive**, the remaining default topical argument retains the same grammatical role it had in the active clause. Two other syntactic properties tend to be associated with non-promotional passives:

- The de-topicalized agent *must* be deleted; it cannot appear overtly.
- Passivization can apply to both transitive and intransitive clauses.

Conversely, in the promotional passives the agent *may* appear overtly, most commonly in an oblique case; and passivization typically applies only to transitive clauses.

2.7.3.2 The diachrony of the zeroed-out agents in non-promotional passives

(a) **The plain-zero passive (Sherpa)**

This type is so ubiquitous that it most commonly flies under the linguist's radar; so that the languages in which it is found have been often described as 'having no passive'. This unmarked passive is particularly common in languages that zero-mark continuing referents (so-called 'pro-drop' languages; see Givón 2017, Ch. 5). In such languages, the passive clause fully resembles the active clause with a continuing anaphoric agent; that is, a clause with a *zero anaphoric* agent. Thus in Sherpa (Koncchok Lama, i.p.c):

(75) a. **Active, non-anaphoric agent**:

    ti   mi-ti-gi   chenyi   chaq-sung

    DEF man-DEF-ERG cup/ABS break-PA/EV

    'the man broke the cup'

    b. **Zero-marked agent**:

    chenyi   chaq-sung

    cup/ABS break-PA/EV

      i. **Active anaphoric interpretation**: '(s/he) broke the cup'

     ii. **Passive interpretation**: 'the cup was broken'

The interpretation of the zero-agent clause in (75b) depends on its discourse context. In a typical chain-medial context with a continuing topical agent ('…s/he was serving tea and…'), (75b) is interpreted as an *active* clause with a continuing anaphoric agent (75b-i). In a context that de-topicalizes the agent ('…first the saucer fell, then…'), (75b) is interpreted as an *agentless passive* (75b-ii).

(b) **The nominalized-VP passive (Ute)**

In Ute, either a verb or a verb-phrase or an entire clause can be nominalized with the suffix -*ta*, the very same suffix that marks the impersonal passive. Thus compare (Givón 2011, ch. 10):

(76) a. **Active**:

    ta'wach<u>i</u> tʉkuavi tʉka-qha

    man/s   meat/o eat-ANT

    'the man ate the meat'

    b. **Lexical nominalization**:
       tɨka-**ta**   túu'atɨ
       eat-**NOM** good/NOM
       'eating is good'

    c. **Clause nominalization**:
       ta'wachi tɨkuavi tɨka-**ta**   túu'a-y
       man/G   meat/O eat-**NOM** good-IMM
       'it is good that the man ate the meat'
       (lit. 'the man's eating (of) the meat is good')

    d. **VP nominalization**:
       tɨkuavi tɨka-**ta**   túu'a-tɨ
       meat/O eat-**NOM** good-NOM
       '(the) eating (of) meat is good'

    e. **Passive**:
       tɨkuavi tɨka-**ta**-qha
       meat/O eat-**PASS**-ANT
       'the meat was eaten'
       (hist.: 'the eating of meat was')

The diachronic logic of the zero-marked agent in the Ute impersonal passive (76e) is rather transparent: its diachronic source, the **nominalized VP** (76d), is also a **zero-subject** construction.[38]

(c) The L-dislocation passive

    In Lunda (Bantu), anaphoric arguments must be marked by clitic pronouns on the verb, with subject pronominal agreement being obligatory. Bantu clitic pronouns have thus fully occupied the functional domain of zero anaphora (Givón 2017, ch. 3). Consider (Givón and Kawasha 2001):

  (77) a. **Active-transitive**:
       aana   **a**-mono Nzua
       children **they**-saw John
       'The children saw John'

      b. **Anaphoric subject and object**:
       a-**mu**-mono
       they-**him**-saw
       'they saw him'

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38. A similar nominalized-VP agentless passive was described for Dutch by Kirsner (1976).

    c. **L-dislocation object (full NP subject):**
       Nzua,   aana   **a-mu**-mono
       John   children **they-him**-saw
       'John, the children saw him'

    d. **L-dislocation (pronominal impersonal subject):**
       Nzua, **a-mu**-mono
       John   **they-him**-saw
       'John, they saw him'

But the pronoun 'they' in (77d) may also function as an *impersonal subject* pronoun, having no specific reference. In which case (77d) can be re-interpreted – with a merged intonation contour – as a *passive* clause:[39]

  (78) **Passive:**
      Nzua **a-mu**-mono
      John   **they-him**-saw
      'John was seen'

The Lunda passive in (78) is marked morphologically by two pronouns: First, the semantically-vacuous subject-agreement pronoun *a-* 'they', the closest stand-in for a main-clause zero anaphora in a Bantu language. And second, an obligatory object pronoun controlled by the default topic-of-passive, the erstwhile L-dislocated object of the active clause (77d). Since neither the subject nor the object NP in Lunda is case-marked, the default topic-of-passive, appearing at the characteristic pre-verbal subject position (SV) and unmarked for case-role, can be interpreted as the grammatical subject of the passive clause – albeit with two morphological peculiarities: First, it sports the vacuous 3rd-person-plural subject agreement. And second, it displays a peculiar obligatory subject agreement – the old Bantu *object* agreement. The Lunda passive thus lives on as a **diachronic hybrid** of two constructions, object L-dislocation and impersonal subject. And it bears clear testimony to its complex diachrony.

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39. Being a diachronic hybrid construction in the midst of re-analysis, the Lunda passive allows an optional oblique-marked agent, as in:

      Nzua **a-mu**-mono   (kwa-meme)
      John   **they-him**-saw by-me
      'John was seen (by me)'

2.7.3.3 **Diachrony of the zeroed-out agents in promotional passives**

On the face of it, promotional passives allow the overt mention of the demoted agent, and thus do not involve a zero-marked agent. However, in languages with such passives, zero-marking ('deleting') the demoted agent is still the most frequent option in discourse. Thus, Cooreman (1987) notes that in the Chamorro passive clause, a promotional passive that allows an overt agent, **90.5%** of passive clauses in narrative are agentless. Comparable figures have been shown for the *be*-marked promotional passive of English (Givón 1979, ch. 2) and Spanish (Hidalgo 1994). Indeed, Hidalgo (1994) has shown that the Spanish *ser*-marked passive with an overtly-mentioned agent fits better the functional profile of an *inverse*, rather than a passive. In the space below we will re-survey the three major types of promotional passive whose diachronic provenance is relatively transparent.

(a) **The adjectival-stative passive**

In some languages, as in the English *be*-passive, the passive clause arises diachronically from – and still resembles structurally – a predicate-adjective construction, with the eventual passive emerging gradually through the following diachronic sequence; schematically:

(79) a. **Predicate-adjective**: It is big
      b. **Adjectival-stative**: It is broken
      c. **Perfect-resultative**: It has been broken
      d. **Agentless passive**: It was broken
      e. **Overt-agent passive**: It was broken by Mary

The oblique agent in English passive clauses is infrequent in natural text, and was added later on in diachrony (Givón 2015a, ch. 17). What licenced its original zero-agent form (79d) was the fact that the diachronic source of the construction (79a,b) was agentless to begin with.

(b) **The reflexive passive**

In some languages, as in the English *get*-passive, a passive clause arises diachronically from – and still resembles structurally – a reflexive middle-voice construction, as in, schematically (Yang and Givón 1994):

(80) a. **Causative with active V-complement**:
   Mary got them to fire John
   b. **Causative with passive V-complement**:
   Mary got John to be fired
   c. **Causative with simplified passive V-complement**:
   Mary got John fired
   d. **Reflexive-causative with passive V-complement**:
   Mary got herself fired
   e. **GET-passive**:
   Mary got fired

The *get*-passive in English is still, overwhelmingly, agentless in natural discourse. Diachronically, what licenses the zero-marking of its agent is the **subject-object co-reference** in the reflexive clause. In the original reflexive (80d), it is the co-referent *patient* that is replaced by a *reflexive pronoun*. But since that patient is co-referent to the agent, the re-interpretation of the reflexive as a passive (80e) also precipitates a re-interpretation of the zero as marking the *agent*.

(c) **The serial-verb adversive passives**

In some languages, lastly, the passive clause arises diachronically from an adversive **clause-chaining** construction, which is later compressed into a **serial-verb** passive clause. In the process, an adversive verb such as 'suffer' grammaticalizes as the passive marker. Such constructions are found in Mandarin, Japanese, Thai or Vietnamese, and often expand their functional scope later on to a generalized passive.[40] Thus, in Mandarin (Li and Thompson 1981; tone marking omitted):

(81) a. **Precursor clause chain**:
   ta   **bei**,   gongsi   chezi-le   [Ø]
   s/he **suffer** company   fire-PERF   O
   's/he suffred, (when) the company fired her'
   b. **Clause chain with zero-marked impersonal agent**:
   ta   **bei**,   [Ø]   chezi-le   [Ø]
   s/he **suffer** S   fire-PERF   O
   's/he suffered, (when) someone fired her'

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40. The English *GET*-passive also started as an adversive passive (Yang and Givón 1994).

c. **Compressed serial clause – adversive passive (older):**
ta **bei** chezi-le
s/he **PASS** fire-PERF
'S/he was fired'

d. **Compressed serial clause – generalized passive (newer):**
sheng-cheng **bei** jiefang-le
province-capital **PASS** liberate-PERF
'the provincial capital was liberated'

Diachronically, what licensed the zeroed-out agent-of-passive in (81c,d) was the zeroed-out agent in the precursor *impersonal-agent* chained clause in (81b). In that clause, two zeros are found – one coding the anaphoric object and abiding by principle (69a), the other coding the unimportant agent and abiding by principle (70a).

2.8 Cataphoric zero in antipassive clauses

2.8.1 Functional definition of antipassive voice

The antipassive began its life in linguistics as a vivid demonstration of how absurd the non-functional definition of grammatical constructions can get, and how our long-term addiction to Saussurean structuralism can pervert the natural logic of cross-language typology. Because the antipassive construction, with some of its peculiar morphology, was first described in **ergative languages** (Silverstein 1972; Dixon 1972, 1979, 1994; Fortescue 1996), it had been considered, for years, to be restricted to ergative languages, and then defined by its morphological characteristics in Chinook Jargon, Dyirbal or Inuit. Non-ergative languages then 'didn't really have an antipassive'. The equivalent of this self-defeating approach to grammatical typology would have the promotional *BE*-passive of English define the passive construction universally, relegating languages such as Ute, Mandarin, Sherpa or Kimbundu to the status of 'not having a real passive'.[41]

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41. For the less-than-salutary effect of recalcitrant Saussurean structuralism on linguistic typology, see ch. 1. The lead plenary talk at the ALT 2015 meeting in Albuquerque (Janic 2015), compressed from a recent dissertation, strove valiantly to demonstrate – largely on structural grounds – that nominative-accusative languages did have antipassive constructions. A simple reference to the functional definition of the antipassive, as in (82) above, would have rendered the entire Rube-Goldberg-like argument moot.

Cogent functional definitions of the antipassive have been around for decades (Heath 1976; Cooreman 1982, 1987, 1988; Klaiman 1991; Givón ed.1994, 2001; Shibatani 2006; *inter alia*). Following our general functional definition of voice constructions in (73) above, the antipassive voice may be defined as:

(82) **Functional definition of the antipassive domain:**
"An antipassive clause is one where the patient of the corresponding active is radically de-topicalized. By default, the surviving agent argument may then become even more topical".

In addition, antipassive clauses often involve some predictable features:

- **Object**: non-referring, indefinite, plural, stereotypical
- **Aspect**: habitual, distributive, repetitive, activity-focused

These added semantic features are predictable default consequences of the core pragmatic feature of the antipassive – de-topicalization of the patient (or a non-subject).[42]

2.8.2 A diachronic typology of zero in antipassives

(a) **Flying under the radar: Plain zero**
As in the case of the passive, the most natural antipassive constructions – zero-marked object (or non-subject) and the closely-related object incorporation – have tended to go wholly unrecognized by linguists. Consider first the most humble zero-marked antipassive of English:

(83) a. **Transitive**:   She drank her brandy
b. **Antipassive**: She drinks like a fish   (⊃ object = liquor)
c. **Transitive**:   He hunted the deer
d. **Antipassive**: He hunts in the fall   (⊃ object = game animals)
e. **Transitive**:   They farmed 1,000 acres
f. **Antipassive**: They farmed near Ignacio   (⊃ object = land)
g. **Transitive**:   He shot ten people
h. **Antipassive**: He shot indiscriminately   (⊃ object = people)

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42. Hopper and Thompson (1980) bear some responsibility for conflating many secondary, predictable, default features of transitivity with its core features.

(b) **Still under the radar: Object incorporation**

One of the most natural ways of zeroing a de-topicalized object is to incorporate it into the verb. This is the main antipassive construction in Ute (above and beyond zero), applying not only to direct objects but also, most frequently, to instrument and manner, two case-roles that tend to be largely either indefinite or non-referring or both. In the process of incorporation, all nominal suffixes – old markers of referentiality – must be shaved off the incorporated noun. In addition, verb-reduplication may be added to signal the distributive aspect. Thus consider (Givón 2011, ch. 10):

(84) **Object incorporation:**

    a. **Transitive, referring object**:
       ta'wa-chi siveetu-**chi** 'uway kukwi-pᵿga
       man-s   goat-**o**   the/o shoot-REM
       'the man shot the goat'

    b. **Antipassive, non-referring object**:
       ta'wa-chi **siveetu**-kukwi-**mi**
       man-s   **goat**-shoot-**HAB**
       'the man shoots goats', 'the man does goat-shooting'

    c. **Antipassive with V-reduplication**:
       ta'wa-chi siveetu-**ku**-gúkwi-**na**-pᵿga
       man-s   goat-**RED**-shoot-**HAB**-REM
       'the man shot goats here and there', 'the man did some goat-shooting'

(85) **Instrument incorporation:**

    a. **Referring instrument**:
       mama-chi tᵿkua-vi wii-**chi-m**   'uru   chaqhavi'na-pᵿga
       woman-s meat-o knife-**o-INSTR** the/o slice-REM
       'the woman sliced the meat with the knife'

    b. **Incorporated stereotype instrument**:
       mama-chi tᵿkua-vi **wii**-chaqhavi'na-pᵿga
       woman-s meat-o **knife**-slice-REM
       'the woman knife-sliced the meat'

(86) **Manner incorporation:**

    a. **Referring manner**:
       mama-**chi-pani** 'uway paghay-'way
       woman-**o-like**   the/o walk-IMM
       '(he) is walking like that woman'

    b. **Incorporated stereotype manner**:
       mama-paghay-mi
       woman-walk-IMM
       '(he) walks like a woman', '(he) woman-walks'

2.8.3   Zero, incorporation, and the rise of antipassive morphology

Let us consider now another common antipassive construction in English, a syntactic blend of two structural elements – nominalized complement verb and the auxiliary verb 'do' or 'go', as in:[43]

(87)   a.   **Active-direct:**   We shot the target
       b.   **Zero *do*-antipassive**:   We **did** some shooting (behind the barn)
       c.   **Zero *go*-antipassive**:   We **went** shooting (out in the desert)
       d.   **OBJ-incorp. *do*-antipassive**:   We **did** some target-shooting (out there)
       e.   **OBJ-incorp. *go*-antipassive**:   We **went** target-shooting

One should consider the incorporated object in (87d,e), the nominalizing verb-suffix *-ing*, and the auxilliary verbs 'do' or 'go' as the nascent **grammatical morphology** that marks these unheralded English antipassives. Given time, all three will become part of the inflectional morphology marking the re-consolidated antipassive verb.

A clearer if diachronically more-advanced case of virtually the same antipassive construction, combining a nominalized verb and the auxiliary 'do'/'act'/'make', has been described in Mocovi, a Guaycuruan language from Argentina. Consider first the contrast between the active-transitive clause and the zero-object antipassive (Álvarez-González and Juárez 2015; Juárez and Álvarez-González 2015):

(88)   a.   **Active-transitive**:
             so-pyoq   **i**-ta-tak   so-yale
             CL-dog   **3/TR**-sniff-PROG   CL-man
             'the dog is sniffing the man'
       b.   **Antipassive**:
             so-pyoq   **re**-ta-**gan**
             CL-dog   **3/IN**-sniff-**AP**
             'the dog sniffs'

As Álvarez-González and Juárez (2015) note, the antipassive suffix *-(a)gan* is a composite of two elements – the nominalizing suffix *-(a)ga*, and the grammaticalized verb *-(e)n* 'do', 'act', 'make'. In addition, the transitive subject-pronominal agreement in the active-transitive clause (88a) changes to an intransitive (middle-voice) subject agreement in the antipassive (88b).

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43. A similar antipassive construction has been noted in French (Álvarez-González and Juárez 2015).

The object in the Mocovi antipassive need not be zeroed out. It may be retained, but then lose its reference/specificity marking, and the verb can then be marked with an **oblique locative suffix,** tagging the object as 'less affected'. In such an object-preserving antipassive, the transitive subject agreement may be retained.[44] Thus consider:

(89)　a.　**Active-transitive**:
　　　　　qomawge　sa-kon-aga　so-qopag
　　　　　we　　　　1-take-PL　　CL-stick
　　　　　'We all took the stick'
　　　b.　**Antipassive**:
　　　　　qomawge　sa-kon-**agan**-aga-**gi**　so-qopaga-r-ipi
　　　　　we　　　　1-take-**AP-PL-LOC**　　CL-stick-PL-COL
　　　　　'We all took sticks'

Demoting a less-affected or non-specific patient by marking it with an oblique case can also be seen in diachronically-mature antipassives of other languages, as in Chamorro or English (Cooreman 1987):

(90)　a.　**Transitive**:
　　　　　un-patek　　i-ga'lago
　　　　　ERG/2s-kick　the-dog
　　　　　'you kicked the dog'
　　　b.　**Antipassive**:
　　　　　ma-matek　**hao**　　**gi**　ga'lago
　　　　　AP-kick　　　**2s/ABS**　LOC　dog
　　　　　'you kicked **at** the dog'

Álvarez-González and Juárez go on to show that the same suffixal combination -*(a)ga-n* used to mark the antipassive verb in Mocovi is also used in the **causative** construction, as in:

(91)　a.　**Simple transitive**:
　　　　　so-piog　i-a'ik　　l-a'at
　　　　　CL-dog　　3/TR-eat　3/PS-meat
　　　　　'the dog eats the meat'

---

44. This retention of the transitive subject pronoun in Mocovi is found in the first person only. In the third person, the subject pronoun in the antipassive changes to the intransitive form.

  b. **Causative**:
   ayim si-ki-**yagan**   so-pyog
   I   1s/TR-eat-**CAUS** CL-dog'
   'I feed the dog', 'I make the dog eat'

But now we face a vexing synchronic puzzle:

(92) **Synchronic puzzle of the Moscovi antipassive verb suffix:**
   "The very same suffixal combination *-(a)ga-n* used in the antipassive,
   which **decreases** transitivity by demoting or zeroing out the object, is
   also used in the causative, which **increases** transitivity by adding an
   object".[45]

Álvarez-González and Juárez solve this apparent synchronic puzzle by track-
ing the diachrony of the antipassive and causative suffixal combination: Both
combine the nominalizer suffix *-(a)ga* with the grammaticalized old verb *-(e)n*
'do'/'act'/'make'. Consider first the *-aga* nominalizer alone:

(93) **Nominalizations:**
  a. l-qopi-**aga**   'his wound'
    his-wound-NOM
  b. i-awig-**aga**   'my burn'
    my-burn-NOM
  c. i-alola-**ga**   'my sickness'
    my-be.sick-NOM
  d. i-nogo-**yaga**   'my sweat'
    my-sweat-NOM
  e. qasileg-**aga**   'brightness'
    be.brigh-NOM
  f. pal-**aga**   'darkness'
    disappear-NOM

The verbal origin of *-(e)n* in Mocovi, Álvarez-González and Juárez then note,
is still evident in its use as a **verbalizer** suffix, converting nouns into transitive
verbs, as in:

---

45. While the causative as a synchronic derivation adds an object to the main
verb, in the diachrony of Mocovi antipassive it adds a *subject* to the nominalized
complement verb.

(94)

noun	verb
(n)atar 'medicine'	n-atar-**en** 3-medicine-**do** 's/he cures' (lit. '… does medicine')
lapo 'a pile'	so-ña:qapioki' Ø-lapo-**n**-tak na-lawa CL-children 3-pile-**do**-PROG CL-soil 'children are piling up the soil' (lit. '… making the soil pile')
tawa 'helper'	yo-tawa-**n** 3-helper-**do** 's/he helps (him/her)' (lit.: '… acts as helper')

The use of nominalized (non-finite) verb forms in complements of causative verbs is widespread, as in English:[46]

(95) a. She made him **leave** the house
b. She caused him **to leave** the house

The diachronic logic of combining the auxiliary verb 'do'/'act'/'make' with a nominalized complement verb to yield an antipassive construction is complex, hinging on the fact that when a verb is nominalized, both its subject and object may be **zeroed out**. In using the transitive verb 'do'/'act'/'make' to then innovate a causative construction, one adds to the construction *both* the subject and object of 'make', as in (schematically):

(96) a. **Intransitive**: The glass fell
b. **Nominalization**: **to**-fall
c. **Causative**: She caused the glass **to**-fall

In contrast, in making an antipassive out of the very same combination of diachronic sources, one adds only the *subject* of 'do' to the construction, but keeps the object/patient of the nominalized verb as a **zero**, winding up with an 'activity' sense of a de-transitive clause. That is, schematically:

---

46. For a discussion of the complementation scale, clause-union and the use of non-finite verb forms in the complements of implicative verbs, see Givón (2001, ch. 12).

(97) a. **Transitive:**   She broke the glass
      b. **Nominalization:** break-**ing**
      b. **Antipassive:**   She did (some) break-**ing**

The zero-marking of an unimportant, non-topical object/patient is, via one diachronic pathway or another, an indispensable component of the gradual assembly of antipassive constructions.

2.9 Closure

The fine-grained functional analysis of syntactic constructions and their attendant grammatical morphology is a colossal enterprise, and the few examples of this we have seen here are but the tip of a large iceberg, touching upon the grammar of anaphoric reference, indefinite reference and the voice constructions. An extensive functional analysis of negation is found in ch. 3, below, noting again the distinction between propositional-semantic and discourse-pragmatic functions. A functional and typological analysis of relative clauses is found in ch. 4. The enterprise of defining grammatical construction in terms of their communicative function, above and beyond their propositional semantics, remains in its infancy. What is more, the kind of functional characterization that was give here is, at best, an intermediate step, one that must be supplemented – and perhaps eventually supplanted – by a more fine-grained neuro-cognitive analysis.[47]

Abbreviation of grammatical terms

1	1st person	ANT	anterior
1s	1st person singular	AP	antipassive
2	2nd person	CAUS	causative
3	3rd person	CL	classifier
3s	3rd person singular	COL	collective
3sf	3rd person singular feminine	DEF	definite
3sm	3rd person singular masculine	DIR	directional
ABS	absolutive	ERG	ergative
ACC	accusative	EV	evidential
ALL	allative	FUT	future

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47. For an extensive discussion of the next stage, see Givón (2005).

Negation in language: Between semantics and pragmatics

3.1   Logic, psycho-logic and pragmatics[1]

In the preceding chapter I suggested that grammar codes, primarily if not exclusively, various discourse-pragmatic functions. Put another way, grammar is not primarily about mental representation, but rather about communication. The discussion of negation in this chapter will serve to further illustrate this point. Negation is particularly striking in this respect because its treatment by linguists is rooted in an enduring logical tradition, going all the way back to Aristotle. It is thus instructive to see how this grammar-coded domain, one that has been so strongly associated with propositional semantics, in fact turns out to have deep discourse-pragmatic roots.

The status of NEG-assertion among the other propositional modalities is bound to remain somewhat murky, since it depends on the perspective chosen as point of departure. The three most common perspectives are:

- truth-conditional logic
- subjective certainty
- communicative pragmatics

In truth-conditional logic, negation is treated in terms of its most obvious logical property, that of **negative truth value**, as in the most basic axiom (Frege 1884; Russell 1905a; Carnap 1958, 1959):

(1)   a.   p = ~~p
      b.   If p is true, then not-p is not true (and vice versa)

As expressed in (1a), the NEG-operator cancels itself out with no discernible effect on the proposition (p) under its scope. As expressed in (1b), negation is part of the **two-valued logic** expressed in the celebrated *law of the excluded middle*, the law that shields logic from contradictions.

Within the second perspective, one that is a bit closer to natural language use, one may contrast negation with the other three main propositional modalities, all graded now in terms of the speaker's **subjective certainty** vis-a-vis the uttered proposition:

(2)   **Logic-based propositional modalities:**

modality	linguistic value	logical value
a. presupposition	taken for granted to be true	necessary truth
b. REALIS-assertion	strongly asserted to be true	factual truth
c. IRREALIS-assertion	weakly asserted to be true	possible truth
d. NEG-assertion	strongly asserted to be false	falsehood

The four propositional modalities in (2) may be thus ranked as:

(3)   **Ranking of epistemic modalities by speaker's subjective certainty:**
presupposition > R-assertion   > IRR-assertion
                                NEG-assertion

While presupposition is, strictly speaking, a contextual-pragmatic notion, logicians have endeavored to confine it to logic, coining the term **logical presupposition** (Keenan 1971; Herzberger 1971; Karttunen 1974), thus consigning it to the speaker's modal stance. As we shall see further below, this restricted notion of presupposition must be expanded to take account of the **discourse context**. As relevant to human communication, the discourse context does not include only what the **speaker** knows or intends, but also the speaker's assessment – in specific communicative contexts – of what the **hearer** is likely to know or intend.

3.2   The puzzling distributional restrictions on referring indefinite objects

So far, neither the logical nor the subjective-certainty aspects of negation require us to deal with the wider discourse context in which the atomic proposition is embedded. But a massive body of linguistic evidence suggests another perspective on negation, a communicative-pragmatic one, whereby

one must consider the context of the negative clause – or negative speech-act – far beyond the bounds of the atomic proposition or its associated modal envelope. In this and subsequent sections we will survey the evidence in order, beginning with the puzzling restrictions on the text-distribution of referring indefinite objects.

Definite objects in English, or any other language that marks definiteness explicitly, are most commonly interpreted as **referring** to a specific individual. This referring interpretation of definite objects can be seen under the scope of either the *realis* or *irrealis* modality. That is:[2]

(4) a. **Under realis scope**:
Joe rode the horse   (⊃ a particular horse)
   b. **Under irrealis scope**:
Joe wanted to ride the horse   (⊃ a particular horse)

Indefinite objects in English, on the other hand, may be interpreted as either **referring** to a specific individual or **non-referring** (generic). However, such potential ambiguity depends on the propositional modality under which the verbal clause falls. Most transitive verbs, those that take a direct object ('accusative'), are semantically **implicative**. That is – unless the clause falls under the scope of irrealis (non-fact) – if the proposition coded by the clause is true, its indefinite object *must* be referring. Under irrealis scope, on the other hand, indefinite objects in English are in principle ambiguous, and can be either **referring** (REF) or **non-referring** (NREF):

(5) a. **Realis scope**:
Joe rode a horse   (⊃ a particular horse)
   b. **Irrealis scope**:
Joe wanted to ride a horse
(i)   REF: … that a friend of his owned   (⊃ a particular horse)
(ii) NREF: … but he couldn't find one
(⊃ a member of the type 'horse')

Under the scope of negation, on the other hand, the range of possible interpretation of indefinite objects in English is restricted, disallowing a referring interpretation. Thus compare:

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2. For an extensive discussion of propositional modalities and their interaction with the reference properties of nominals falling under their scope, see Givón (2001, ch. 6).

(6)   Joe didn't ride a horse
    a. **REF:**   *There is a horse that Joe didn't ride   (*⊃ a particular horse)
    b. **NREF:** Joe didn't ride *any* horse   (⊃ a member of the type 'horse')

A similar restriction is seen in the use of anaphoric pronouns. Thus compare the referring pronoun 'her' with the non-referring pronoun 'one' in:

(7)   a. **Realis scope:**
       John met a girl yesterday,
       (i)   **REF:**   … and Fred met **her** too (⊃ a particular girl)
       (ii) **NREF:** … and Fred met **one** too (⊃ a member of the type 'girl')
    b. **Negative scope:**
       John didn't meet a girl yesterday,
       (i)   **REF:**   *and Fred didn't meet **her** either   (*⊃ a particular girl)
       (ii) **NREF:** … and Fred didn't meet **one** either
                                (⊃ a member of the type 'girl')

My late friend Tim Shopen (i.p.c.) suggested that referring-indefinites under the scope of negation are in fact possible in English, as in (8B(i)) below:

(8)   A: What happened to Mary?
    B: i.   Well, she didn't read **a book** that was on the required list, and as a result she flunked the exam.
       ii. Well, there was **a book** that was on a required list, but she didn't read **it**, and as a result she flunked the exam.

While (8B(i)) seems acceptable or 'grammatical', and thus part of the native speaker's proverbial 'competence', it is interesting that in actual English texts such usage is rare to the point of being unattested. In contrast, the alternative in (7B(ii)) – introducing the referring indefinite first as the subject of an affirmative *realis* clause and then referring to it under a negative scope with an anaphoric – referring, definite – pronoun is vastly preferred. Thus, consider the distribution of referring definite and indefinite subjects and direct-objects in **affirmative** clauses in four English texts.

(9) **Frequency distribution of referring definite vs. indefinite subjects and object in main-declarative- affirmative-active clauses in English**

text[3]	subject				dir. object			
	definite		indefinite		definite		indefinite	
	N	%	N	%	N	%	N	%
non-fiction	43	87.0	6	13.0	24	48.0	25	52.0
fiction	160	90.0	17	10.0	123	64.0	68	36.0
news	36	80.0	9	20.0	15	33.0	30	67.0
sports	63	98.0	1	2.0	31	48.0	33	52.0
total:	302	**91.0**	33	**9.0**	191	**56.0**	156	**44.0**

With relatively minor cross-text variation, referring subjects in such clauses are overwhelmingly definite, while 44.0% of referring objects are indefinite, thus a main venue for introducing new referents into the discourse.[4]

Consider now the distribution of referring indefinite objects in **negative** clauses in two English fiction texts, in (10) below:

(10) **Frequency distribution of referring indefinite objects in main-declarative-negative-active clauses in two fiction texts in English**

text[5]	definite		indefinite	
	N	%	N	%
#1	46	100.0	/	0.0
#2	29	100.0	/	0.0

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3. The four texts counted were, non-fiction: Chomsky (**1973**, pp. 3–12); fiction: L'Amour (**1965**, pp. 1–25); news: The Los Angeles Times (9-1-74, front-page news); sports: The Los Angeles Times (9-1-74, front page sports section).

4. This bias toward definite subjects recapitulates Keenan's (1976) observations.

5. The two texts are #1: Grey (1926, pp. 1–35), and #2: Christie (**1939**, pp. 1–47).

Clearly, in actual English usage, the seeming option, as in (8B(i)), of introducing new referents into the discourse as objects of negative clauses, is not exercised.[6]

In standard English,[7] the indefinite article 'a(n)' is ambiguous with respect to the reference status of the NP. Some languages mark this distinction more explicitly. Thus, for example, in Bemba (Bantu) the vcv-noun prefix marks a nominal as referring, leaving the distinction between definite and indefinite unmarked, thus ambiguous. In contrast, the cv-noun prefix marks nominals as non-referring. Thus, for direct objects under affirmative scope (Givón 1973a, 1973b):

(11) **Realis scope:**
    a. **REF:**
        a-a-somene **ici**-tabo
        3s-PA-read   REF-book
        's/he read **a/the** book'   (⊃ a particular book)

    b. ***NREF:**
        *a-a-somene **ci**-tabo   (*⊃ a member of the type 'book')
        3s-PA-read   NREF-book

(12) **Irrealis scope:**
    a. **REF:**
        a-a-fwaayile uku-soma **ici**-tabo
        3s-PA-want   INF-read   REF-book
        's/he wanted to read **a/the** book'   (⊃ a particular book)

    b. **NREF:**
        a-a-fwaayile uku-soma **ci**-tabo
        3s-PA-want   INF-read   NREF-book
        's/he wanted to read a book'   (⊃ a member of the type 'book')

The same distinction – and ambiguity between definite and indefinite interpretation – can be seen in nominal predicates:

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6. These frequency distributions also demonstrate, incidentally, the rather questionable status of Chomsky's distinction between 'performance' and 'competence'.

7. As noted in ch. 2, above, spoken English has introduced the indefinite marker 'this' to mark only referring – important and cataphorically persistent – indefinites. This new indefinite marker contrasts with 'a(n)', which marks non-referring, unimportant, and cataphorically non-persistent indefinites. See discussion of the numeral 'one' as an indefinite marker in Hebrew, directly below.

(13) **Nominal predicate:**

    a.   **REF:**

        Joni ni **umu**-puupu uo   n-a-mweene

        J.   be REF-this   REL 1s-PA-see/ASP

        'J. is **a/the** thief that I saw'   (⊃ a particular thief)

    b.   **NREF:**

        Joni **muu**-puupu

        J.   NREF-thief

        'J. is **a** thief'   (⊃ a member of the type 'thief')

Under the scope of negation, the referring VCV-marked nominal could only be interpret as definite, thus re-capitulating the restriction on referring indefinites we found in English. That is:

(14) **Negation scope:**

    a.   **REF:**

        ta-a-a-somene   **ici**-tabo

        NEG-3s-PA-read   REF-book

        's/he didn't read **the** book'   (⊃ a particular book)

        '*s/he didn't read **a** book'   (*⊃ a member of the type 'book')

    b.   **NREF:**

        ta-a-a-somene   **ci**-tabo

        NEG-3s-PA-read   NREF-book

        'S/he didn't read **a/any** book'   (⊃ a member of the type 'book')

Lastly, some languages mark clearly the distinction between definite and indefinite NPs, and then also mark the distinction between referring and non-referring indefinites. But they still show the same restriction on referring indefinites under the scope of negation, as in English and Bemba. As an illustration, consider spoken Israeli Hebrew, where the numeral 'one' has grammaticalized as the referring-indefinite marker (Givón 1981b; Wright and Givón 1987). Under the scope of *realis* and *irrealis* first (see also ch. 2, above):

(15) **Realis scope:**

    a.   **REF:**

        hu kana   sefer-**khad** etmol

        he bought book-**one**   yesterday

        'he bought a book yesterday'   (⊃ a particular book, important)

    b.   **NREF:**

        hu kana   sefer etmol

        he bought book yesterday

        'he bough a book yesterday' (⊃ a particular book, but unimportant)

(16) **Irrealis scope:**

    a.   REF:

        hu ratza   li-knot sefer-**khad** etmol

        he wanted to-buy book-**one**   yesterday

        'he wanted to buy a book yesterday'   (⊃ a particular book)

    b.   NREF:

        hu ratza   li-knot sefer etmol

        he wanted to-buy book yesterday

        'He wanted to buy a book yesterday' (⊃ a member of the type 'book')

Lastly, under the scope of negation, referring indefinites are barred, as in English and Bemba:

(17) **Negation scope:**

    a.   REF:

        *hu lo   kana   sefer-**khad** etmol   (*⊃ a particular book)

        he NEG bought book-**one**   yesterday

    b.   NREF:

        hu lo   kana   (af)   sefer etmol

        he NEG bought (any) book yesterday

        'he didn't buy a/any book yesterday' (⊃ a member of the type 'book')

Negation as a propositional modality, it seems, is not the preferred venue for introducing new information – in this case new nominal participants – into the discourse. Is this strong distributional restriction, shown in languages that mark referentiality, definiteness and indefiniteness rather differently, an arbitrary fluke, or does it point toward more systematic properties of negative clauses in human communication?

3.3   The communicative pragmatics of negation

We turn now to the discourse pragmatics of negation, that is, to the communicative context in which NEG-assertions are used, where a third perspective emerges, beyond both propositional logic and subjective certainty. Consider first the two possible responses to a rather broad question of information below, the first an affirmative (18a), the second a negative (18):

(18) a.   A: – What's new?

          B: – My wife is pregnant.

          A: – Congratulations!

b. A: – What's new?
   B: – My wife **isn't** pregnant.
   A: – Gee, was she **supposed to** be?

The negative response in (18b) is indeed bizarre in this context, and rightly elicits a baffled repartee, one suggesting that something was amiss in the **presupposed shared background** vis-a-vis which the negative assertion was transacted. What is missing, of course, is the shared background of the corresponding affirmative – *my wife is pregnant*. Negative assertions are, it seems, made on the tacit assumption that the hearer either has heard about, believes in, is likely to take for granted, or is at least familiar with the corresponding affirmative. The speaker uttering the negative assertion in (18b) was not entitled to such a *presupposition* of familiarity or belief on the part of the hearer, hence the baffled response.

It is clear, however, that the notion of presupposition relevant to the discussion here is not that of *logical* presupposition, but rather a *pragmatic* one. If that were not the case, one would be proposing that NEG-assertions state the falsity of P while presupposing its truth – a logical contradiction.

The corresponding affirmative that is pragmatically presupposed in the felicitous use of NEG-assertions may be established explicitly in the preceding discourse, as in:

(19) **Background**:   Joe told me he won $10,00 in the lottery,
     NEG-assertion: tho later I found out **he didn't**.

But the corresponding affirmative as presupposed background may also be contributed by one's interlocutor, as in:

(20) **Background**:   A: I understand you're leaving tomorrow.
     NEG-assertion: B: **I'm not**. Who told you that?

The speaker may also rely, in assuming the hearer's background familiarity, on specific knowledge about the hearer's state of affairs or state of mind. As an illustration, consider the felicity of the three alternative responses to the NEG-assertion in (21):

(21) A: So you **didn't** leave after all.
     B: i.   No, it turned out to be unnecessary.
        ii. Who said I **WAS** going to leave?
        iii. How did **YOU** know I was going to?

Response (21i) suggests that B ('hearer') is going along with A's ('speaker's') pre-supposition of the corresponding affirmative as shared background. Response (21ii) suggests that the B ('hearer') believes that A must have been misled. In response (21iii), B registers surprise at how the information leaked out to A, by inference thus conceding that A indeed had it right.

The presupposed background associated with NEG-assertions can also be traced to shared *generic* information. As an illustration, consider:

(22)   a.   There was once a man who **didn't** have a head.
      b.   ?There was once a man who had a head.
      c.   ?There was once a man who **didn't** look like a frog.
      d.   There was once a man who looked like a frog.

The reason why the negative assertion (22a) is pragmatically felicitous is be-cause it reports a break from the norm ('every person has a head'). The reason why (22b) is pragmatically odd is because it merely echoes the norm, and thus harbors an implicit *tautology*. Conversely, the negative (22c) is a tautology that merely re-phrases the norm ('people don't look like frogs'), and is thus prag-matically odd. While the affirmative (22d) breaks the norm, and is thus prag-matically felicitous. Now, if one happened to live in a universe where humans normally had no head, or where they most commonly resembled frogs, both felicity contrasts in (22) would have been reversed.[8]

In terms of their pragmatic presuppositions then, our four epistemic mo-dalities may be ranked in yet a third way:

(23)   **Communicative-pragmatic ranking of epistemic modalities:**
      presupposition > R-assertion > IRR-assertion
      NEG-assertion

3.4   Negative assertion as a distinct speech-act

The preceding discussion makes it clear that NEG-assertions are a distinct speech-act, one that differs crucially from affirmative assertions in terms of the background presuppositions and communicative goals of the speaker. The contrast between affirmative and negative assertions may be summarized as follows:

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8.   For the pragmatic felicity conditions of assertion as a speech-act, we are all indebted originally to Grice (1968/1975).

(24) **Affirmative vs. negative declarative speech-acts:**
      a. **AFF-assertion**: The hearer *doesn't* know, the speaker *knows*.
      b. **NEG-assertion**: The hearer knows *wrong*, the speaker *knows better*.

In uttering a NEG-assertion, the speaker does not intend to communicate new information to the hearer. Rather, s/he wishes to correct the hearer's misguided beliefs.

3.5 The cognitive status of negation

3.5.1 Change vs. stasis

From a cognitive perspective, an event is a **change** in an otherwise inert universe. It is our informal experience of a law of Newtonian physics – the default status of **inertia** (stasis) – that motivates the assignment of positive status to events, vis-a-vis the negative status of non-events in our construed experience. The cognitive difference between events and non-events is grounded in their highly skewed **frequency distribution**:

(25) **Stasis**, i.e. a NEG-event, is the high-frequency default norm.
      Change, i.e. an event, is the low-frequency counter-norm.

An event – change – is thus the cognitively salient **figure**, standing out against the **ground** of stasis (non-event). The strong frequency skewing of events vs. non-events in our construed experience, thus the much lower frequency of NEG-assertion in natural communication (see ch. 2), guarantees that events (figures) should be more informative than non-events (ground). This definition of information, or saliency, in terms of frequency distribution or predictability, is the implicit cornerstone of **information theory** (Shannon and Weaver 1949; Attneave 1959; Koffka 1935; see further discussion in ch. 8).

Negative assertions as a distinct speech-act may be viewed as a pun or play on the norm, indeed a **norm-reversal**. They are used when – much more rarely in communication – one establishes the event rather than stasis as ground. On such a ground, the non-event now becomes – temporarily, locally, infrequently – salient and informative. This is supported by the much lower text-frequency of NEG-assertions in natural communication. Thus, consider Table (26) below, where the frequency distribution of negative vs. affirmative declarative clauses is assessed in two English texts, one fiction, the other non-fiction.

(26) **Frequency distribution of affirmative vs. negative declarative clauses in written English**

	clause type					
	affirmative		negative		total	
text[9]	N	%	N	%	N	%
academic	96	95%	5	**5%**	101	100%
fiction	142	88%	20	**12%**	162	100%

The higher frequency of negative clauses in the fiction text in (26) may be significant, perhaps having to do with the fact that fiction contains conversational interactions, in which the perspective shifts among speakers. Such shifts furnish a natural venue for deontic conflicts and epistemic disagreements. In contrast, non-fiction is written from the perspective of a single speaker, whose goal and knowledge-base are more uniform.

3.5.2 The ontology of negative events

The interplay between norm and counter-norm in the use of negation may be further illustrated with a number of simple examples. Consider first the alternative episode-initial gambits in:

(27) a. A man came into my office yesterday and said…
b. *A man **didn't** come into my office yesterday and said…
c. ?**Nobody** came into my office yesterday and said…

The non-event (27b) is pragmatically – indeed grammatically – the oddest. This must be so because if an event did not occur at all, why should one bother to talk about a specific individual who 'participated' in that non-event? While seemingly more acceptable, (27c) is still pragmatically odd. This is so because the high-frequency norm of one's everyday routine is *not* 'all people visit my office at all times', but rather 'most people don't ever visit my office'. Visits to one's office are thus much less frequent than non-visits, which is what makes such visits more salient. On the background norm of non-events, the event reported in (27a) is indeed informative, thus pragmatically more felicitous.

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9. The non-fiction text was Chomsky (**1973**, pp. 3–12). The fiction text was L'Amour (**1965**, pp. 1–25).

Consider next:

(28) a. The man you met yesterday is a crook.
     b. ?The man you **didn't** meet yesterday is a crook.

Normally, one meets a limited number of people in a given day. So, to iden-
tify a person by an event – coded in the affirmative REL-clause in (28a) – is
informative and salient, an apt way of distinguishing him from the many men
you did not meet that day. Given that norm, (28b) is surely odd – unless the
figure-ground relations were reversed, as in:

(29) You were supposed to meet four men yesterday. Three showed up, the
     last one **never did**.

Against the new ground in (29), the non-event in (28b) now becomes salient,
informative, pragmatically felicitous.

Consider next:

(30) a. Where did you leave the keys?
     b. ?Where **didn't** you leave the keys?

In general, WH-questions like (30a) are presuppositional. That is, the entire
clause excepting the WH-pronoun is taken for granted as background informa-
tion. The affirmative (30a) is pragmatically felicitous because *normally* there
are a myriad possible places where your keys have *not* been left, but only one
place (at a time) where they *have* been left. This is why the negative (30b) is
pragmatically bizarre.

Even supposing that the background expectations were somehow reversed,
say with:

(31) I didn't leave my keys anywhere.

question (30b) would remain odd. This is so because, given that a potentially
infinite number of places would qualify for the correct answer, the purpose of
asking – to elicit a specific location in response – cannot be fulfilled. Indeed,
(30b) is only pragmatically felicitous as an *echo question*.

Consider next:

(32) a. When John arrives, I'll leave.
     b. ?When John **doesn't** arrive, I'll leave

The affirmative (32a) is felicitous because the particular time when John may arrive is unique and can be easily specified, but the gazillion times when John may not arrive – all of them non-events – cannot. The negative (32b) is thus odd – unless one modifies the figure-ground relations, as in:

(33)   I waited and waited there. Finally, when he **didn't** arrive, I left.

What makes the negative ADV-clause in (33) felicitous is that it establishes, as a *unique* reference point, the time by which John did *not* arrive. Once such a unique point is specifiable, the use of the negative time-adverb becomes felicitous.

Consider next the oddity of negative comparative clauses, as in:

(34)   a.   She ran as fast as he did.
     b.   ?She ran as fast as he **didn't**.
     c.   She **didn't** run as fast as he did.
     d.   ?She **didn't** run as fast as he **didn't**.
     e.   He's as tall as she is.
     f.   ?He's as tall as she **isn't**.
     g.   He **isn't** as tall as she is.
     h.   ?He **isn't** as tall as she **isn't**.

Apparently, negation is barred from the **standard of comparison** portion of comparative clauses. This is so presumably because the standard normally involves some level of performance above the absolute zero.

Under certain conditions, it is of course possible to make the absolute zero the standard of comparison, as in:

(35)   a.   Something is better than **nothing**.
     b.   Being is better than **non**-**being**.

But these are highly marked, abstract patterns involving neither specific events nor referring subjects. Thus compare:

(36)   a.   **Abstract**:
        To win is better than to **not** win.
     b.   **Specific (VP negation)**:
        ?She won better than she **didn't** win.
     c.   **Specific (lexical antonym)**:
        She won better than she **lost**.

The seeming felicity of (36c) is due to the fact that 'lose', while a paired anto-nym of 'win', is not an overt negative speech-act, thus not merely the absence of winning.

3.5.3 The ontology of negative states

Example (36c) above brings to mind the cognitive status of paired anto-nymic adjectives. In such pairs, one member denotes the *presence* of a property (positive), the other its *absence* (negative), a contrast that need not involve an overt negative marker on the latter. The assignment of polarity in antonymic pairs is not a mere reversal of truth value. Rather, strong evidence suggests that the biased relation between the two members is linguistically real and cogni-tively motivated.

On the linguistic side first, the negative member behaves as the **marked**, re-stricted case, denoting only the extreme negative pole on the scale. The positive member, on the other hand, behaves as the **unmarked** case, denoting the entire scale. This is evident from the asymmetry in acceptable responses to questions:

(37)   a.   **Unmarked–positive–question**:
             How **tall** is she?
             (i)   **Positive-pole response**:
                   Very tall.
             (ii) **Negative-pole response**:
                   Very short.
       b.   **Marked–negative–question**:
             How **short** is she?
             (i)   **Positive-pole response**:
                   *Very tall.
             (ii) **Negative-pole response**:
                   Very short.

In the same vein, the nominalized positive member of an antonymic pair – length, width, height, thickness, health – is the generic term for the entire scale. The nominalized negative member, on the other hand – shortness, narrowness, lowness, thinness, sickness – is the restricted term for only the lower extreme of the scale.

In cognitive terms, there are strong grounds for suggesting that the sys-tematic bias between the positive and negative member of antonymic pairs is rooted in **cognitive saliency**, whereby the positive members represent, rather consistently, the perceptually more salient pole, the figure. Thus consider:

(38)	positive	negative	perceptual property
	big	small	ease of visual perception
	long	short	" " " "
	tall	short	" " " "
	wide	narrow	" " " "
	fat/thick	thin	" " " "
	high	low	" " " "
	light/bright	dark	" " " "
	fast	slow	" " " " (rate of change)
	loud	quiet	ease of auditory perception
	high	low	" " " "
	sharp	dull	ease of tactile perception
	heavy	light	" " " "
	rough	smooth	" " " "
	spicy	bland	ease of olfactory perception

On the **ground** of the perceptually less-salient negative member of the pairs in (38), the absence, the **figure** of the positive member (presence) stands out as informative, very much as events (changes) stand out on the ground on non-events (stasis). It has also been shown that the positive members of antonymic pairs are processed faster (Clark 1969) and learned earlier by children (Clark 1971). This is compatible with the suggestion that negative speech-acts are cognitively more complex, given the more complex presuppositional context they entail.

3.6   The scope of negation

3.6.1   Presupposition, assertion and negation

When a proposition – packaged as a clause – is negated, its logical truth value is reversed, so that rather than being asserted as true it is now asserted as false. But the effect of negation on propositions in natural language is more complex. Most typically, only a portion of a negative proposition falls under the scope of negation, while the rest is shielded, and is indeed *presupposed*.

Consider first examples (39), (40) and (41) below. In each, the main clause is affected by negation, but the subordinate clause, being presupposed, is not. In (39b), the shielded proposition is a restrictive REL-clause:

(39)   a.   She saw the man **who stood in the corner**
                                                        (⊃ He stood in the corner, and she saw him)
       b.   She **didn't** see the man **who stood in the corner**
                                                        (⊃ He stood in the corner, but she didn't see him)

In (40b), the shielded proposition is a verb complement:

(40)   a.   I'm sorry **he's sick**   (⊃ He's sick, and I'm sorry about it)
       b.   I'm **not** sorry **he's sick**   (⊃ He's sick, but I'm not sorry about it)

In (41b), lastly, the shielded proposition is a participial ADV-clause:

(41)   a.   **Running out of gas**, she stopped
                                                        (⊃ She was running out of gas, and she stopped)
       b.   **Running out of gas**, she (still) **didn't** stop
                                                        (⊃ She was running out of gas, but she didn't stop)

The most common variant of negation, the one we have dealt with mostly thus far, is **verb phrase negation.** In this type, the subject is most commonly excluded from the scope of negation, and may indeed be considered as part of the presupposed portion of the clause (Keenan 1976a). Thus consider:

(42)   The King of France **didn't** eat his supper

Logicians used to insist that the negative (42) has two interpretations, (43a) and (43b) below (Keenan 1969):

(43)   a.   **Narrow interpretation (subject excluded)**:
            There is a king of France, and he **didn't** eat his supper.
       b.   **Wide interpretation (subject included)**:
            There **is no** king of France, therefore it is nonsensical to say that he didn't eat his supper.

Most speakers of English, however, would find it hard to assign interpretation (43b) to the negative assertion (42), especially that there are much more natural alternative forms that code such an interpretation, such as:

(44)   a.   There **is no** king of France
       b.   **No** king of France ate his supper
       c.   **Nobody** ate their supper

The **noun-phrase negation** forms used in (44) will be discussed further below.

The intuition that VP-negation, as in (42), is not used to convey the same interpreted as subject-NP negation (43b) or (44) can be tested by looking at the frequency distribution of negation forms in natural text. In one such study, all the negative clauses in an English fiction text were collected and divided into three categories:

- VP-negation, subject NP excluded from NEG-scope
- VP-negation, subject NP included under NEG-scope
- Subject-NP negation

The frequency distribution of these three categories is reported in Table (45) below.

(45) **Distribution of negative forms (and interpretations) in an English fiction text (MacDonald 1974**, pp. 49–70)

VP negation				SUBJ-NP negation		total	
SUBJ excluded		SUBJ included					
N	%	N	%	N	%	N	%
60	89.0	/	/	7	11.0	67	100.0

The frequency distribution in (45) suggests that in *none* of the instances of VP-negation does the subject-NP fall under the scope of negation. When the author wanted to accomplish that, the only syntactic form he used was NP-negation.

3.6.2 Negation and contrastive focus

In addition to typically excluding the subject, VP-negation can be – and often is – used to further narrow down the portion of the clause that falls under NEG-scope. A common way of doing this is by combining VP-negation with **contrastive stress** placed on one constituent in the clause, to yield **focused negation**. In such constructions, the focused constituent is the only one falling under NEG-scope. The rest of the clause is presupposed. Thus consider:

(46) a. **Neutral VP-negation:**
John didn't kill the goat (⊃ He did **not kill the goat**)
b. **Subject focus:**
JOHN didn't kill the goat (⊃ Someone else killed it, but **not John**)

c. **Object focus**:
    John didn't kill the **GOAT**

    (⊃ He killed something, but **not the goat**)

d. **Verb focus**:
    John didn't **KILL** the goat

    (⊃ He did something to the goat, but **not kill** it)

The same focused negation can be affected by combining contrastive stress with a **cleft** construction, as in:

(47) a. **Neutral VP-negation**:
          John didn't kill the goat   (⊃ He did **not kill the goat**)

      b. **Subject focus**:
          It's not **JOHN** who killed the goat

          (⊃ Someone killed it, but **not John**)

      c. **Object focus**:
          It's not the **GOAT** that John killed

          (⊃ He killed something, but **not the goat**)

      d. **Verb focus**:
          ?It's not **KILLING** that John did to the goat

          (⊃ He did something to the goat, but **not kill** it)

Focus is a discourse-pragmatic notion, involving the speaker assessment of the hearer's disposition to hold a contrary belief. The interaction of negation with focus constructions serves to highlight the discourse-pragmatic component of negation.

3.6.3 Negation and optional constituents

When optional event participants, including adverbs, are present in the clause, they tend to attract the focus of negation, leaving the rest of the clause presupposed. As illustrations, consider:

(48) a. **Optional benefactive**:
          She didn't write the book **for her father**

          (⊃ She wrote it, but **not for him**)

      b. **Optional associative**:
          She didn't write the book **with her sister**

          (⊃ She wrote it, but **not with her**)

c. **Optional instrumental**:
She didn't shoot him **with this gun**
($\supset$ She shot him, but **not with this gun**)

d. **Optional purpose ADV**:
She didn't flunk **on purpose** ($\supset$ She flunked, **but not on purpose**)

e. **Optional time ADV**:
She didn't come **Saturday** ($\supset$ She came, but **not Saturday**)

f. **Optional frequency ADV**:
She doesn't visit **often** ($\supset$ She visits, but **not often**)

g. **Optional locative**:
She didn't kick the ball **out of the park**
($\supset$ She kicked it, but **not out of the park**)

The inferences that seem to operate in (47a-g) are pragmatic and normative, rather than logical and absolute. A change in the intonation/stress pattern of the clause may yield other inferences.

The reason why optional constituents attract the focus of NEG-assertion is probably because they also attract the focus of *assertion* in the corresponding affirmative clauses. The normative pragmatic inference governing the use of optional constituents thus seems to be:

(49) "If an optional element is chosen, chances are it is the focus of the assertion".

3.6.4 **Grammatical marking of the scope of assertion – and negation**

Lastly, some languages have special aspectual markers that serve to signal whether the scope of the asserted information in the clause either includes or excludes the verb, with the latter meaning that the verb (in addition to the subject) is part of the pragmatic presupposition associated with the clause. As an example, consider Bemba (Bantu). In this language, in affirmative clauses when the VP contains **only a verb** (intransitive), the aspectual marker that marks the exclusion of the verb from the scope of assertion cannot be used. This is so, presumably, because the subject is already presupposed, presupposing the verb leaves no constituent to be asserted. Thus:[10]

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10. For details see Givón (1973a, 1975b)

(50) a. **Verb-including aspect**:
      ba-**àli**-boombele
      3p-**vinc**-work/asp
      'They worked'

     b. **Verb-excluding aspect**:
      *ba-**à**-boombele
       3p-**vexc**-work/asp

When the VP contains another constituent, be it an obligatory direct or indirect object, or an optional indirect object or adverbial, *both* aspects can be used, yielding a contrast between broad focus (including the verb; vinc) and narrow focus (excluding the verb; vexc). Thus:

(51) a. **Verb-including focus**:
      ba-**àli**-iile   ku-mushi
      3p-**vinc**-go/asp to-village
      'They **went to the village**'

     b. **Verb-excluding focus**:
      ba-**à**-iile   ku-mushi
      3p-**vexc**-go/asp to-village
      'They went **to the village**'

     c. **Verb-including focus**:
      ba-**àli**-liile   umukate
      3p-**vinc**-eat/asp bread
      'They **ate (the) bread**'

     d. **Verb-excluding focus**:
      ba-**à**-liile   umukate
      3p-**vexc**-eat/asp bread
      'They ate **the bread**'

     e. **Verb-including focus**:
      ba-**àli**-boombele   saana
      3p-**vinc**-work/asp hard
      'They **worked hard**'

     f. **Verb-excluding focus**:
      ba-**à**-boomble   saana
      3p-**vexc**-work/asp hard
      'They worked **hard**'

    g. **Verb-including focus**:
      ba-**àli**-boombele   ne-emfuumu
      3p-**VINC**-work/ASP with-chief
      'They **worked with the chief**'

    h. **Verb-excluding focus**:
      ba-**à**-boomble   ne-emfumu
      3p-**VEXC**-work/ASP with-chief
      'They worked **with the chief**'

In cleft-focus clauses, typically contrasting nominal or adverbial constituents, only the verb-excluding aspect can be used:

(52) a. **Verb-including focus**:
      *ni-ku-mushi ba-**àli**-iile
      be-to-village 3p-**VINC**-go/ASP

    b. **Verb-excluding focus**:
      ni-ku-mushi ba-**à**-iile
      be-to-village 3p-**VEXC**-go/ASP
      'It's **to the village** that they went'

    c. **Verb-including focus**:
      *múukate ba-**àli**-liile
      be/bread 3p-**VINC**-eat/ASP

    d. **Verb-excluding focus**:
      múukate ba-**à**-liile
      be/bread 3p-**VEXC**-eat/ASP
      'It's **bread** that the ate'

    e. **Verb-including focus**:
      *ni-saana ba-**àli**-boombele
      be-hard 3p-**VINC**-work/ASP

    f. **Verb-excluding focus**:
      ni-saana ba-**à**-boomble
      be-hard 3p-**VEXC**-work/ASP
      'It's **hard** that they worked'

    g. **Verb-including focus**:
      *ni-ne-emfuumu ba-**àli**-boombele
      be-with-chief   3p-**VINC**-work/ASP

    h. **Verb-excluding focus**:
      ni-ne-emfuumu ba-**à**-boomble
      be-with-chief   3p-**VEXC**-work/ASP
      'It's **with the chief** that hey worked'

The very same restriction also applies to negative clauses:

(53) a. **Verb-including focus**:
        *ta-ba-**àli**-iile   ku-mushi
         NEG-3p-**VINC**-go/ASP to-village

   b. **Verb-excluding focus**:
        ta-ba-**à**-iile   ku-mushi
        3p-**VEXC**-go/ASP   to-village
        'They didn't go **to the village**'

   c. **Verb-including focus**:
        *ta-ba-**àli**-liile   umukate
         NEG-3p-**VINC**-eat/ASP bread

   d. **Verb-excluding focus**:
        ta-ba-**à**-liile   umukate
        NEG-3p-**VEXC**-eat/ASP   bread
        'They didn't eat **the bread**'

   e. **Verb-including focus**:
        *ta-ba-**àli**-boombele   saana
         NEG-3p-**VINC**-work/ASP hard

   f. **Verb-excluding focus**:
        ta-ba-**à**-boomble   saana
        NEG-3p-**VEXC**-work/ASP   hard
        'They didn't work **hard**'

   g. **Verb-including focus**:
        *ta-ba-**àli**-boombele   ne-emfuumu
         NEG-3p-**VINC**-work/ASP with-chief

   h. **Verb-excluding focus**:
        ta-ba-**à**-boomble   ne-emfumu
        NEG-3p-**VEX**-work/ASP   with-chief
        'They didn't work **with the chief**'

The data surveyed above about the interaction between negation, scope-of-assertion and contrastive focus, all taken together, again highlight the pragmatic aspect of negation in language.

3.7   Negation and social interaction

As noted above, NEG-assertion is a **contrary** speech-act, whereby the speaker denies the hearer's presumed belief. One would thus expect its use to be extremely sensitive to the relative social position of the interlocutors. For example, when our interlocutor is perceived to be of higher status, most of us

would, automatically, tend to tone down our disagreement, couching our contrary opinions in a variety of softening, less offensive verbal devices. Some of those devices involve well-known sub-modes of **irrealis**, as in, for example:

(54) a. Quite, quite.
  b. Yes, I see.
  c. I see what you mean.
  d. I suppose you got a point there.
  e. Perhaps, maybe not quite so.
  f. You might wish to maybe consider…
  g. Well, I'm not sure about that, maybe…
  h. Now if it were up to me, I would suggest…

In more traditional societies, including small-town America, overt NEG-assertions are considered rude, and are less frequent than in academic discourse. In such *Societies of Intimates*, open disagreement and contrariness are a disruptive social force, and various, oft indirect, means are sought to avoid head-on NEG-assertions.[11] As an illustration of this, consider the following passage from a novel depicting small-town life. The passage involves a disagreement about facts, and the subsequent **negotiation of reality** between two friends, *Mrs. Phillip J. King* and *Momma*. The substantive issues at stake are marked below in italics. The various irrealis devices used to cushion the impact of contrary assertions are given in bold-face.[12]

(55) "…Mrs. Phillip J. King said he had been *dashing*, but Momma would not
      go along with dashing and said **to her mind** he had been *not unattractive*,
      but Mrs. Phillip J. King couldn't see fit to drop all the way from dashing
      to not unattractive, so her and Momma negotiated a description and
      arrived at *reasonably good looking*, which was mutually agreeable though
      it seemed for a minute or two that Mrs. Phillip J. King might hold out to
      have the reasonably struck from the official version. But Momma went
      on to tell her how she **thought** *his nose had a fanciful bend to it* which
      distracted Mrs. Phillip J. King away from the reasonably because, as
      she told Momma back, she **had always thought** his nose *had a fanciful*

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11. For a more extensive discussion of the contrast between the 'Society of
Intimates' vs. the 'Society of Strangers' and some of its cultural and communicative correlates, see chs. 5, 7, below, as well as Givón and Young (2001)

12. From Pearson (1985, pp. 191–192).

bend to it herself. Mrs. Phillip J. King called it *a Roman nose* and she said there wasn't anything uppity or snotty about it but it was purely **a sign of nobility**. And Momma said he **certainly** carried himself *like a Roman*, which sparked Mrs. Phillip J. King to **wonder if maybe he hadn't** *come from Romans*, *if maybe* that was**n't** why he was *a Republican*. But Momma said she **recalled** he was *a notable Democrat*. And Mrs. Phillip J. King said, "**Maybe** *he was*". And Momma said she **believed** so. And Mrs. Phillip J. King said "**Maybe** he was" again… I was not present when Mrs. Phillip J. King decided she couldn't let *reasonably good looking* rest peacefully and resurrected the whole business with the argument that *a moustache under that fancifully bent nose* **would have most certainly** made for *dashing*. But Momma could not see clear to allow for a moustache since there had not been one actually; however, Mrs. Phillip J. King **insisted** that **if** Momma **could just imagine** *a finely manicured and dignified Douglas Fairbanks-style moustache* under that Roman nose then all of the rest of the features **would surely** come together and **pretty much** scream *Dashing* at her. But even with a moustache thrown in Momma **could not sit still** for any degree of *dashing* though Mrs. Phillip J. King campaigned rather fiercely for *Considerably Dashing* and then *Somewhat Dashing* and then *A Touch Dashing*, so Momma for her part **felt obliged to retreat some** from *reasonably good looking* and her and Mrs. Phillip J. King **settled on** *passably handsome* with Mrs. Phillip J. King supplying the *handsome* and Momma of course supplying the *passably*…"

Somewhat paradoxically, negation itself, when combined with some other irrealis operator, can be used as a softening device in the face of perceived higher authority. This toning-down function of negation seems to apply to both epistemic and deontic modalities. Thus consider:

(56)   **disguised deontic or epistemic suggestion**   **implicit real intent**

    a. **Won't** you please come in?   (⊃ Do come in)

    b. I suppose he **isn't** done yet.   (⊃ I wonder if he's done)

    c. I **don't** suppose he's done yet?   (⊃ I wonder if he's done)

    d. **Wouldn't** it be better if…   (⊃ It would be better if…)

    e. I suppose you **couldn't** spare a fiver… (⊃ I wish you could)

    f. **Wouldn't** you want to buy one?   (⊃ I would like you to buy one)

In such use, negation is most commonly coupled with some **irrealis** operator, such as modal, subjunctive, conditional, yes/no question or irrealis adverbials. The two examples of overt negation used in the epistemic negotiation in (55) above were both of this type:

(57) "…to **wonder if maybe** he had**n't** *come from Romans*,
      if maybe that was**n't** why he *was a Republican*…"

3.8 Closure

I have tried to show here that the function of negation in language, above and beyond its traditionally-recognized propositional logic or subjective certainty, also has a robust discourse-pragmatic component, one that predicts many of the distributional and grammatical behaviors of negative clauses. All it takes for the linguist to discover these communicative functions of negation is to consider the discourse context within which negative clauses are used in natural communication. Having surveyed the disparate facts, an inescapable conclusion is that NEG-assertion is a distinct speech act, contrasting in terms of communicative goals and speaker's beliefs with the three traditionally-recognized speech-acts:

(58)	speech act	speaker's beliefs in context
a.	AFF-declarative:	speaker knows *P*, hearer doesn't know P
b.	NEG-declarative:	hearer wrongly believes in *P*, speaker knows better
c.	Interrogative:	speaker doesn't know *P*, hearer knows *P*
d.	Imperative:	speaker desires a state-of-affairs *P* that doesn't yet exist and solicits hearer's action to bring *P* about

Abbreviations of grammatical terms

3s	3rd person singular	NREF	non-referring
3p	3rd person plural	PA	past
AFF	affirmative	REF	referring
ASP	aspect	REL	relative marker
INF	infinitive	VEXC	verb excluded
NEG	negative	VINC	verb included

The grammar of case: Semantic role, pragmatic function, morphology and syntactic control

4.1 Introduction[1]

The grammar of nominal case is a prime example of the complex interaction between multiple overlapping functions, and the corresponding complex array of overlapping structures and structural constraints involved. On the functional side, one finds the **semantic roles** of event participants interacting with their **discourse-pragmatic functions**, the latter mostly those related to topicality (see ch. 2). On the structural side, one finds the more overt correlate of case: case-marking morphology, word-order and pronominal agreement, and the more abstract **syntactic constraints** associated with grammatical constructions, which then interact with those concrete devices. All that, plus the balance between language universals and cross-language diversity.

Our treatment of nominal case harkens back to the structure-bound Classical tradition, one that took it for granted that a nominal's case-role was marked, transparently, by its case morphology. Early Transformational Grammar (Chomsky 1965; Hall 1965) played down the notion of case, either semantic or pragmatic, letting it 'fall out of' phrase-structure tree configurations and the purely structural categories of noun-phrase (NP) and prepositional phrase (PP). Under the impact of increasing concern with typological diversity in the 1970's, the seminal work of Edward Keenan on the universals of 'subject', and thus implicitly of nominal case, expanded the scope of the discussion exponentially, dividing subject properties into (Keenan 1976a):

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(1)   **Properties of grammatical subject:**
   a.   **Functional properties**: reference, definiteness, topicality
   b.   **Overt grammatical properties**: case-marking morphology, word-order, agreement
   c.   **Behavior-and-control properties**: the government of co-reference in complex syntactic constructions

During the early days of Transformational Grammar, behavior-and-control properties usually meant case-role government of **transformations** (Chomsky 1965, ch. 3; Hall 1965). Recast in better empirical terms, 'transformations' could be translated into **complex syntactic constructions**. Indeed, Keenas's work led to the emergence of a brand new sect of Generative Grammar – **Relational Grammar**, and an explosive rise in the study of grammatical relations (Perlmutter and Postal 1974; Johnson 1974; Hawkinson and Hyman 1974; Chung 1975, 1976; Keenan 1975, 1976a,b; Gary and Keenan 1975; Cole and Sadock eds 1975; Kimenyi 1976; Li ed. 1976; *inter alia*). The subsequent enrichment of the data base of cross-language – typological – diversity of case-marking systems ('alignment'; e.g. Dixon 1972) made it possible to better appreciate the complex interaction between function, morpho-syntactic structure, and the grammatical behavior of syntactic constructions governed by the subject or object case-roles.

4.2   Clausal participants and semantic roles

4.2.1   States, events, and actions

A proposition may signify a **state**, involving no change over time. The state may be either temporary (of limited duration) or permanent (of relatively long duration), or of some intermediate duration.

A proposition may also signify an **event**, involving change from one state to another over time. The change may be fast and *bounded*, thus construed as a change from a distinct initial state to a distinct final state. Or it may be slow and *unbounded*, thus construed as an ongoing **process** without dwelling on its temporal boundaries. Many events, further, are initiated by an active, deliberate **agent**. Such events are considered **actions**.

Typical examples of states, events and actions are:

(2) a. **Temporary state**:   She was angry
     b. **Permanent state**:   She was tall
     c. **Bounded event**:   The ball fell to the floor
     d. **Unbounded event**:   The ball rolled slowly downhill
     e. **Bounded action**:   She dropped the ball
     f. **Unbounded action**:   She rolled the ball slowly downhill

4.2.2 Semantic roles

The major semantic roles typically taken by participants in states or events are listed in (3), (4) below, divided into two main categories:

- **obligatory participants**: those that are necessary for the core meaning of the state/event
- **optional participants**: those that may be added optionally

One semantic participant type, the **locative**, may be obligatory in some event/ state types but optional in others.

Some examples of the most common semantic roles in simple state/event clauses are given below, with the participant's grammatical role given in parentheses:

(3) **Obligatory participants**
     a. **Agent (subject)**:   **Mary** kicked John
     b. **Patient of state (subject)**:   **Mary** is tall
     c. **Patient of state (object)**:   Mary saw **John**
     d. **Patient of change (subject)**:   **John's arm** broke
     e. **Patient of change (object)**:   Mary broke **John's arm**
     f. **Dative (subject)**:   **John** knew Mary
     g. **Dative (object)**:   John scared **Mary**
     h. **Dative (indir. object)**:   John talked **to Mary**
     i. **Locative of state (indir. obj.)**:   She lives **in Philadelphia**
     j. **Locative of change (indir. obj.)**:   He went **to the store**
     k. **Locative of transfer (indir. obj.)**: She put the book **on the table**

(4) **Optional participants**
     a. **Optional locative (indir. obj.)**:   He kicked the ball **in the yard**
     b. **Instrument (indir. obj.)**:   She chopped firewood **with an axe**
     c. **Benefactive (indir. obj.)**:   He fixed breakfast **for his mother**
     d. **Associative (indir. obj.)**:   She worked **with her father**
     e. **Manner (adverb)**:   He left **in a hurry**
     f. **Time (adverb)**:   He left **yesterday**

The definitions of the main semantic roles are given in (5) below, broadly following Fillmore (1968) and Chafe (1970).[2]

(5) **Definitions of main semantic roles:**
   - **agent** = the participant, typically animate, who acts deliberately to initiate the event, and thus bears the responsibility for it (AGT)
   - **patient** = the participant, either animate or inanimate, that either is in a state or registers change-of-state as a result of an event (PAT)
   - **dative** = a conscious participant in the event, typically animate, but not the deliberate initiator (DAT)
   - **locative** = the place, typically concrete and inanimate, where the state is, where the event occurs, or toward which or away from which some participant is moving (LOC)
   - **instrument** = a participant, typically inanimate, used by the agent to perform the action (INST)
   - **benefactive** = the participant, typically animate, for whose benefit the action is performed (BEN)
   - **associative** = an associate of the agent, patient or dative of the event, whose role in the event is similar, but who is not as important (ASSOC)
   - **manner** = the manner in which an event occurs or an agent performed the action (MANN)
   - **time** = the time when the event/action took place (TM)

The latter two case-roles, manner and time, are often grouped with a larger and less-than-clearly-defined category of *adverbs*.

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2. A more sparse, and thus more abstract, system has been proposed by Anderson (1971), one that conflates the agent (3a) with the instrumental (3m), and the dative (3h) with both the benefactive (3n) and locative (3i,j,k,l,). The grammatical consequences of such a system, however, are limited in two respects. First, it predicts best only one morphological aspect of grammatical relations, case-marking, leaving behavior-and-control properties largely unaccounted for. And second, even the morphological predictions of this system tend to be confined to one major case-marking type – the ergative-absolutive. One may as well note that in principle each verb has its own specific manner of participation and thus its own array of semantic case-roles; so that the classification given here, like all classifications, is perforce reductive and abstract.

4.2.3 **Grammatical roles**

As noted informally in (3), (4) above, participants in states or events, taking whatever semantic role, can also assume different grammatical roles in the clause. Of those, the most universally attested are:

(6) a.   subject (s)
     b.   direct object (o)
     c.   indirect object (io)
     d.   predicate (PRED)
     e.   adverb (ADV)

Of the five grammatical roles listed in (6), the first two (6a,b) are the most central and display more grammatical consequences in many more languages. The last three (6c,d,e) are more peripheral, displaying fewer or no grammatical consequences in most languages.

As a brief illustration of the five grammatical roles listed in (6), consider:

(7) a.   The woman   gave   a book   to the child
            ‾‾‾‾‾‾‾‾   ‾‾‾‾‾‾   ‾‾‾‾‾‾‾‾‾‾‾
               S   O   IO

     b.   Mary   is   a teacher
          ‾‾‾‾   ‾‾‾‾‾‾‾‾‾
            S   PRED

     c.   She stopped working   at five o'clock
                                ‾‾‾‾‾‾‾‾‾‾‾‾‾‾
                                     ADV

Even the most cursory look at the examples of semantic roles given in (3), (4) above would point to a striking fact: The mapping from semantic to grammatical roles in the simple – main, declarative, affirmative, active – clause is far from random. At the very least, the following generalizations emerge:

(8) **Constraints on mapping from semantic to grammatical roles in the simple clause:**
     a.   An agent can only be the subject.
     b.   A patient can only be the subject or direct object.
     c.   A dative can be the subject, direct object or indirect object.
     d.   All other semantic roles can only be indirect objects.

4.2.4 **Topicality and grammatical relations**

In Chapter 2, above, a considerable body of evidence was presented concerning the functional aspects of referential coherence. In particular, we noted that the functional notion of *topicality* conflates two distinct communicative-pragmatic aspects of the way referents are deployed in discourse, each with its own heuristic measure in text:

(9) **The two faces of topicality:**
a. **Referential accessibility** or **predictability** vis-a-vis the **anaphoric** discourse context
b. **Referential importance** or **persistence** vis-a-vis the **cataphoric** discourse context

Several seminal works in the 1970's labored to unpack the complex relations between semantic role, topicality and grammatical case-roles, most conspicuously Keenan (1976a), Hawkinson and Hyman (1974), Moravcsik (1974), Givón (1976), and Li (ed. 1976). One of the early suggestive generalizations that came out of those studies involves the 'accessibility' of the various semantic roles to the subject or object grammatical role, as in:

(10) **Hierarchy of access to subjecthood:**[3]
AGT > DAT > PAT > OTHERS

One of the most consistent insights emerging out of this work is that the grammatical subject was the grammaticalized **primary topic** of the clause, while the grammatical object was the grammaticalized **secondary topic**. Hierarchy (10) thus turned out to also express, roughly, the likelihood of the various semantic roles being topical in discourse:

(11) **Hierarchy of topicality of semantic roles:**[4]
AGT > DAT/BEN > PAT > OTHERS

And likewise, the ranking of the grammatical roles in terms of topicality:

(12) **Topicality ranking of grammatical roles:**
SUBJ > OBJ > OTHERS

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3. Moravcsic (1974); **Hawkinson and Hyman (1974)**; Timberlake (1975); **Givón (1976); Li (ed. 1976)**; *inter alia.*

4. **Givón (1976).**

A fairly transparent conclusion from the discussion thus far is that the strictly-structural grammatical relations such as 'subject' and 'object' are predictable grammatical consequences of the interaction between clause-level semantic roles, on the one hand, and the discourse-pragmatics of topicality, on the other.

4.3 The accessibility hierarchy: Government of complex construction

4.3.1 Preliminaries

In two influential papers, Keenan and Comrie (1972, 1977) proposed that the various grammatical case-roles have differential 'access' to governed syntactic processes, those that involve co-reference conditions on complex grammatical constructions. Such processes fall under the rubric of Keenan's (1976a) behavior-and-control properties of subjects. That hierarchy was given as:

(13) **Accessibility hierarch of grammatical case-roles (Keenan and Comrie 1977):**

   S > DO > IO > OBLIQUES > GEN > COMPAR

The four most conspicuous grammatical constructions that fell under this presumably-universal generalization were REL-clauses, V-complements, promotional passives and promotion to DO ('applicative').

The universality claims associated with hierarchy (13) were somewhat overblown, given that the languages that supplied the crucial evidence for the hierarchy, KinyaRwanda and Indonesian for direct object (DO) control and Philippine languages for subject (S) control, had some rather unique typological features associated with passivization or promotion to DO:

(14) a. **Promotion to S** ('passivization') that required obligatory verb-coding of the semantic role of the subject (Philippine languages)[5]
     b. **Promotion to DO** ('applicative') that required obligatory verb-coding of the semantic role of the direct object (KinyaRwanda, Indonesian)

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5.   The interpretation of the Philippine situation as synchronically passivization is problematic, since the presumed active and passive constructions in these languages, and the interpretation of the 'topic' NP as the grammatical subject, is problematic (Schachter 1976). And one of the presumed 'passive' constructions, the one that promotes the patient to 'subjecthood', may in fact be the re-analyzed *ergative* clause (Brainard 1994).

These languages – or language types – exploit the verb-coding system in (14a) or (14b) by 'coupling' relativization with either passivization or promotion-to-DO, so that the semantic role of the zeroed-out co-referent argument inside the REL-clause can be read off the verb. In order to appreciate the fine detail of this arrangement, one must first consider the function and grammatical typology of REL-clauses.

4.3.2 Functional definition of relative clauses

REL-clauses are one of the devices used to code the referential coherence of nominals (see ch. 2), thus part of the grammar of noun phrases. In the NP, REL-clauses, most commonly embedded as modifiers of the head noun, perform the function of **grounding** the nominal referent to its discourse context. This grounding can pertain to either the anaphoric or cataphoric context. We will discuss below the three main grounding functions of REL-clauses.

4.3.2.1 Anaphoric grounding: Restrictive REL-clauses modifying definite head nouns

When speakers use a restrictive REL-clause to modify a definite head noun, they assume that the referent is accessible to the hearer in his/her episodic memory of the current text. But unlike referents coded by zero, unstressed pronouns or pronominal agreement, a definite full-NP is used when the speaker assumes that referent is *not* currently activated in the hearer's attention or working memory (see ch. 2). The restrictive REL-clause is then used to **ground** the referent to its previous anaphoric trace in the hearer's episodic memory, and thus **re-activate** it in the hearer's attention or working memory.

The REL-clause furnishes the hearer with an explicit clue – a proposition, packaged as a restrictive REL-clause – that recapitulates a state or event in the preceding discourse in which the referent was a participant, as subject, direct object, indirect object, etc. The REL-clause is thus a processing clue guiding the hearer to the text-location in episodic memory where the referent is to be grounded. In employing such a device, the speaker assumes that the state or event coded in the REL-clause is accessible to the hearer in his/her episodic memory. This assumption of accessibility or familiarity is the **pragmatic pre-supposition** associated with REL-clauses.

In addition to their pragmatic presupposition, restrictive REL-clauses also abide by a narrower semantic constraint on **co-reference**:

(15) **Co-reference condition on ʀᴇʟ-clauses:**
"The zeroed-out argument in the ʀᴇʟ-clause must be co-referent to the head noun in the main clause".

As an illustration of this, consider:

(16) **Subject ʀᴇʟ-clause**: The man **who married my sister** is a crook.
    a. **Asserted main clause:**   The man is a crook.
    b. **Presupposed subordinate clause:** The man married my sister.

The definite head noun 'the man' in the main clause (16a) is modified by the ʀᴇʟ-clause 'who married my sister', whose full propositional value ('deep structure') is given in (16b). Within that modifying clause, the co-referent to the head noun 'the man', coded by the ʀᴇʟ-pronoun 'who', is the *subject*.

But the head noun may also be co-referent with the **object** or **indirect object** inside the ʀᴇʟ-clause, marked in current English by zero, as in, respectively:

(17) **Object ʀᴇʟ-clause**: The man **my sister married [0]** is a crook
    a. **Asserted main clause:**   The man is a crook
    b. **Presupposed subordinate clause:** My sister married **the man**

(18) **Indir. object ʀᴇʟ-clause**: The man **my sister lives with [0]** is a crook
    a. **Asserted main clause:**   The man is a crook
    b. **Presupposed subordinate clause:** My sister lives **with the man**

4.3.2.2 Cataphoroic grounding: Restrictive ʀᴇʟ clause with indefinite head nouns

Indefinite NPs code new referents upon their first introduction into the discourse. Some such indefinites may be important or topical, and thus likely to recur in the subsequent discourse. Restrictive ʀᴇʟ-clauses are a common device for grounding such indefinite referents upon their first introduction, supplying a **salient initial description** that would facilitate subsequent access and retrieval.

The semantic co-reference condition (15) applies equally to ʀᴇʟ-clauses that modify indefinite head nouns. However, the pragmatic presupposition concerning some state/event in the anaphoric discourse does not apply here, because the referent, introduced into the discourse for the first time, has no prior anaphoric trace in episodic memory. Rather, the proposition underlying the ʀᴇʟ-clause here is pragmatically *asserted*, and the function of the ʀᴇʟ-clause here is to orient the hearer toward the *subsequent* – cataphoric – discourse, in anticipation of recurring reference.

As illustrations, consider:

(19) a. **Subject REL-clause:**
A man **who said he knew my sister** came by yesterday and…
(i) **Asserted main clause:**   **A man** came by yesterday and…
(ii) **Asserted subject REL-clauses:** **That man** said he knew
          my sister.

b. **Object REL-clause:**
A woman **I had never met [0] before** knocked on the door last night and…
(i) **Asserted main clause:**   **A woman** knocked on the door last night and…
(ii) **Asserted object REL-clause:** I never met **that woman** before.

c. **Indir. object REL-clause:**
A horse **I was riding on** [0] went lame and…
(i) **Asserted main clause:**   **A horse** went lame and…
(ii) **Asserted indir. object REL-clause:** I was riding on **that horse**.

4.3.2.3 Ancilliary asserted information: Non-restrictive REL-clauses

Not all languages code non-restrictive REL-clauses distinctly, and some functionally-equivalent non-restrictive clauses don't resemble a REL-clause. Still, whatever their exact syntactic form, all non-restrictive REL-clauses also abide by the semantic condition (15) of co-reference with the head noun of the main clause. Pragmatically, however, non-restrictive REL-clauses are not presupposed, but rather *asserted*.

Non-restrictive REL-clauses are typically **parenthetical assertions,** conveying information that the speaker may deem less central to the main thrust of the discourse. Being less central, or 'backgrounded', such information may still serve to ground the referent into the discourse, either anaphorically with a definite head noun, or cataphorically with an indefinite head noun. Both uses are illustrated below.

(20) a. **Anaphoric grounding (definite head):**
Then the woman, **who was standing next to the door**, pulled a gun and…

b. **Cataphoric grounding (REF-indefinite head):**
A good friend of mine, **who I hope you'll meet soon**, just called and…

Unlike their restrictive counterparts, non-restrictive REL-clauses cannot modify *non-referring* head nouns. Thus, compare:

(21) a. **Definite head noun**:
          My friend Joe, who is married to my sister, might stop by later.
      b. **REF-indefinite head noun**:
          A friend of mine, who is married to my sister, might stop by later.
      c. **NON-REF head noun*:
          *Any friend of mine, who is married to my sister, might stop by later.

4.3.3 The cross-language typology of REL-clauses

In the following sub-sections we will survey the considerable typological cross-language diversity of REL-clauses, focusing in particular on how either zero or its various functional equivalents code the co-referent argument inside the REL-clause. As suggested earlier regarding the typology of passive clauses (ch. 1), the synchronic typology of REL-clauses is determined, ultimately, by the various diachronic pathways that gave rise to the diverse synchronic types.[6]

4.3.3.1 Preamble: The case-role recoverability problem[7]

As noted above, all REL-clauses, whether restrictive or non-restrictive, abide by the same co-reference constraint (15), specifying that some nominal argument in the REL-clause must be co-referential to the head noun in the main clause. When the co-referent argument in the REL-clause is zeroed out, one can readily recover its **referential identity** from the overtly-expressed head noun in the main clause, presumably following the normal procedure for zero anaphora or anaphoric pronouns (ch. 2). But that head noun is marked for its case-role in the *main* clause. So how does one recover the **case-role** of the zeroed-out argument inside the REL-clause?

The case-role recoverability problem is solved in different languages by different syntactic means, giving rise to the core feature of the cross-language typology of REL-clauses. Most often than not, it is the *diachronic precursor* of the REL-clause that predicts the choice of synchronic case-role recoverability strategy.

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6. See also discussion in Givón (2015a, ch. 26).

7. For the original discussion see Givón (2001, ch. 14).

4.3.3.2 **The zero-cum-gap strategy: Japanese**

Japanese REL-clauses arise diachronically from chained (chain-medial) clauses, which in Japanese are historically nominalized (Shibatani 2007), thus akin to participial clauses. Consequently, the **zero-anaphora** strategy used to code recurrent referents in chained clauses in Japanese discourse has been transferred into the grammar of REL-clauses. The hallmark of this minimalist strategy is that the case-role of the missing co-referent argument in the REL-clause is computed without any morphological provisions. In doing so, the hearer presumably relies on the following available information:

- the lexical-semantic case-frame of the verb in the REL-clause;
- the referential and thus lexical identity of the missing argument, read off the head noun;
- the case-roles of the other arguments in the REL-clause, which are still present and case-marked in the normal way.

Given such information, the hearer can infer, by subtraction, the case-role of the missing argument inside the REL-clause. Thus consider (Katsue Akiba, i.p.c.):[8]

(22)   a.   **Main clause**:
otoka-**ga** onna-**ni**   tegami-**o** kaita
man-**s**   woman-**DAT** letter-**o**   sent
'The man sent a letter to the woman'

   b.   **Subject REL-clause**:
[**0**] onna-**ni**   tegami-**o** kaita otoka-**wa**…
      woman-**DAT** letter-**o**   sent man-**TOP**
'the man who sent a letter to the woman…'

   c.   **Object REL-clause**:
otoka-**ga** onna-**ni**   [**0**] kaita tegami-**wa**…
man-**s**   woman-**DAT**   sent letter-**TOP**
'the letter that the man sent to the woman…'

   d.   **Dative REL-clause**:
otoka-**ga** [**0**] tegami-**o** kaita onna-**wa**…
man-**s**   letter-**o**   sent woman-**TOP**
'the woman to whom the man sent a letter…'

One would expect the zero-cum-gap case-role recoverability strategy to be found in languages answering to the following diachronic-typological conditions:

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8. See also Kuno (1973).

- zero anaphora of co-referents in chained clauses
- rigid word-order (Japanese SOV, Chinese SVO)
- REL-clauses arising diachronically from clause chaining

4.3.3.3 Clause chaining and anaphoric pronouns: Bambara and Hittite

In this REL-clause type, the paratactic precursor to embedded REL-clauses is a finite chained (conjoined) clause falling under a separate intonation contour. One of two adjacent clauses already functions as the asserted would-be main clause, and the other as the presupposed would-be REL-clause. In most of the languages that display this strategy, one can also find the next diachronic stage, a *condensed* variant where the two clauses come under a unified intonation contour (Mithun 2006, 2007a, 2007b, 2009). In many such cases, no further restructuring is done beyond this early merger of the intonation contours.

As an illustration of this diachronic route to embedded REL-clauses, consider Bambara (Mendeic; Niger-Congo). Consider first the paratactic (non-embedded) variants, where the demonstrative *min* 'that' modifies the co-referent noun inside the would-be REL-clause, as in (22a-e) below. One could consider *min* an evolving REL-clause maker, or REL-pronoun (as in English); but it still retains its use as a demonstrative modifier or pronoun; and its position in the clause is compatible with its original use. Thus, consider (Bird 1968; Ibrahima Coulibaly, i.p.c.; tone left unmarked):

(23) a. **Unembedded, pre-posed (SUBJ-rel):**
cɛ **min** ye muru san, n ye **o** ye.
man REL PA knife buy 1s PA **him** see
'The man *who* bought the knife, I saw him'.
(Hist.: '*That* man bought the knife, I saw him'.)

b. **Unembedded, post-posed (SUBJ-rel):**
n ye **o** ye, cɛ **min** ye muru san.
1s PA **him** see man REL PA knife buy
'I saw him, the man *who* bought the knife'.
(Hist.: 'I saw him, *that* man bought the knife'.)

c. **Unembedded, pre-posed (OBJ-rel):**
n ye so **min** ye, cɛ be **o** dyɵ.
1s PA house REL see man PROG **it** build
'The house *that* I saw, the man is building it'.
(Hist.: 'I saw that house, the man is building it'.)

d. **Unembedded, post-posed (OBJ-rel):**
cɛ   be   **o** dyǝ, n ye so   **min** ye.
man PROG **it** build 1s PA house **REL** see
'The man is building it, the house *that* I saw'.
(Hist.: 'The man is building it, I saw *that* house'.)

e. **Unembedded, extraposed:**
cɛ   ye muru san, n ye **min** ye.
man PA knife buy 1s PA **REL** see
'The man bought the knife, *that one* I saw'.
('Hist.: 'The man bought the knife, I saw that one (the knife)'.)

No re-ordering of clausal elements occurs in such paratactic REL-clauses. Both the anaphoric pronoun *o* ('s/he', 'it') and the demonstrative *min* ('that') are used the same way they are used in chained clauses in discourse. Simple adjacent-clause anaphora in clause chaining in Bambara is marked by **unstressed anaphoric pronouns**, which can be seen in the would-be main clause in (23b). But the same anaphoric pronouns are also used in the would-be REL-clauses in (23c,d). In the still-paratactic (23e), the anaphoric pronoun is dispensed with altogether, leaving the **demonstrative pronoun** *min* to mark the co-referent argument inside the REL-clause.

Bambara can also place the two clauses under a joint intonation contour, a configuration that is the earliest stage of embedding. This second strategy is less common, and involves placing the entire would-be REL-clause at the NP's location inside the main clause, again dispensing with the anaphoric pronoun. Thus (Bird 1968):

(24) a. **Simple main clause:**
n ye cɛ   ye.
1s PA man see
'I saw the man'.

b. **With REL-clause:**
n ye [cɛ   **min** ye muru san] ye.
1s PA [man **REL** PA knife buy] see
'I saw the man *who* bought the knife'.
(Hist.: 'I, *that* man bought the knife, saw (him)'.)

Lastly, the anaphoric pronoun may be dropped altogether, yielding a structure that looks like an **extraposed REL-clause** with zero-marked co-referent argument. The transition from (25b) to (25c) below still involves no re-ordering nor any added morphology, only the merger of the two intonation contours and loss of the anaphoric pronoun (Bird 1968):

(25) a. **Simple (main) clause**:
cɛ   ye muru san.
man PA knife buy
'The man bought the knife'.

b. **Chained paratactic configuration**:
n ye cɛ   **min** ye, **o** ye muru san.
1s PA man **REL** see he PA knife buy
'The man that I saw, he bought the knife'.
(Hist.: 'I saw that man, he bought the knife'.)

c. **With merged intonation contours**:
n ye cɛ   **min** ye [0] ye muru san.
1s PA man **REL** see   PA knife buy
'The man that I saw bought the knife'.
(Hist.: 'I saw that man, (he) bought the knife'.)

Another language with a similar clause-chaining source of REL-clauses is Hittite (Justus-Raman 1973; Justus 1976; Probert 2006). In Old Hittite, both clauses – in a paratactic chained pattern – are marked with a *conjunction*, but with no separate anaphoric pronoun. Rather, in unembedded object REL-clauses, such as (26a,b) below, the REL-marker *ku-* carries the accusative suffix, signaling that the zero argument in the REL-clause was its object. Thus (Probert 2006):

(26) a. **nu   ku-it**   LUGAL-uš teez-zi, **nu**   apaa-at Luzzi karap-zi
          CONJ REL-ACC king-NOM say-3s **CONJ** that-ACC Luzzi do-3s
          'whatever the king says, that the Luzzi shall perform'.

b. ku-u-ša-ta-**ma**   ku-**it**   píddaa-i,
    bride-price-PTC-**CONJ** REL-**ACC** give-3s
      na-aš-kan   šameen-zi
      CONJ-he-PTC   forfeit-3s
    'whatever bride-price he gave, he forfeits (it)'.

The conjunction may be dropped from the first clause, yielding an emphatic focus construction:

(27) ku-**iš**   pa-apreez-**zi**, **nu**   apaa-aš-pat   3
      REL-**NOM** be-impure-**3s** CONJ that-one-NOM-PRT three
      gín   ku.babbar paa-**i**
      shekel/ACC silver   give-**3s**
      'whoever is impure, *that very man* shall give three silver shekels'.

Since Hittite has obligatory subject pronominal agreement on the verb, the marking of the zero co-referent argument in subject REL-clauses, as in (27) above, is split: The REL-marker *ku-* carries the *nominative* suffix, thus tagging the zeroed-out argument as the subject of the REL-clause. And the verb is marked with third-person-singular *pronominal agreement*, the normal short-distance anaphoric device used in clause chaining (see ch. 2).

Lastly, the second conjunction may also be dispensed with, as in (28) below, with the very same split-marking of the zeroed-out subject argument as in (27) above:

(28) pa-apreez-**zi** **ku**-iš,   3   gín   ku.babbar paa-**i**
      be-impure-**3s** REL-NOM three shekel silver   pay-**3s**
      'the one who is impure, (he) pays three silver shekels'.

The REL-marker *ku-* inside the Hittitle REL-clause is analogous to the Bambara *min*, and may have been a demonstrative determiner, here used as a pronoun. And the Hittite obligatory subject agreement is analogous to the Bambara anaphoric pronoun *o*.

4.3.3.4 **The anaphoric pronoun or pronominal agreement strategy: Hebrew**

In Modern Hebrew, the same anaphoric pronouns used in chained (conjoined) clauses are also used to mark the zeroed-out argument inside the REL-clause. If the co-referent argument is the subject, the obligatory subject pronominal agreement is used in both constructions. Thus, compare:

(29) a. **Anaphoric subject in a conjoined main clause**:
          Nira ba'-**a**   le-vaqer ve-nafl-**a**   ve-niftseʕ-**a**
          N.   came-**3sf** to-visit   and-fell-**3sf** and-got.hurt-**3sf**
          'Nira came to visit and fell and got hurt'
      b. **Subject REL-clause**:
          ha-'isha   **she**-ba'-**a**   hena 'etmol…
          the-woman REL-came-**3sf** here   yesterday
          'the woman who came here yesterday…'

In direct-object REL-clauses, the same anaphoric pronoun can be used as in conjoined clauses, but this usage is optional,[9] alternating with zero anaphora. Thus compare:

(30) a. **Anaphoric object pronoun in conjoined clause**:
    Nira ba'-a   'etmol,   ve-Yo'av ra'a   'ot-**a**
    N.   came-3sf yesterday, and-Y.   saw/3sm ACC-**3sf**
    'Nira came yesterday, and Yoav saw her'
  b. **Anaphoric object pronoun in the REL-clause**:
    ha-'isha   **she**-Yoav ra'a   ('ot-**a**)…
    the-woman REL-Yoav saw/3sm ACC-**3fs**
    'the woman that Yoav saw (her)…'

The anaphoric pronoun strategy becomes obligatory in indirect-object REL-clauses, using the same preposition-marked anaphoric pronoun as in conjoined clauses. Thus:

(31) **Indirect object:**
  a. **Anaphoric dative pronoun in conjoined main clause**:
    Nira ba'-a   le-sham, ve-Yo'av natan
    N.   came-3sf to-there and-Y.   gave/3sm
     l-**a**   'et-ha-sefer
     to-**2sf** ACC-the-book
    'Nira came over and Yoav gave her the book'
  b. **Anaphoric dative pronoun in REL-clause**:
    ha-'isha   **she**-Yoav natan   l-**a**   'et-ha-sefer…
    the-woman REL-Yoav gave/3sm to-**3sf** ACC-the-book
    'The woman Yoav gave the book to…'
  c. **Anaphoric locative pronoun in conjoined main-clause**:
    haya   sham kise'-ħad, 'az Yo'av yashav ʃal-**av**
    was/3sm there chair-one so Y.   sat/3sm on-**it**
    'There was a chair there, so Yoav sat on it'
  d. **Anaphoric locative pronoun in REL-clause**:
    ha-kise'   **she**-Yoav yashav ʃal-**av**…
    the-chair REL-Yoav sat-he   on-**it**
    'the chair Yoav sat on…'

---

9. The direct-object anaphoric pronoun becomes obligatory in more complex multiple-embedding contexts (Givón 1973c).

The anaphoric-pronoun (or pronominal agreement) strategy used in Hebrew chained clauses was thus extended to mark the zeroed-out co-referent argument inside the REL-clauses, perhaps via an intermediate stage of non-restrictive (parenthetical) REL-clauses.[10]

4.3.3.5 Nominalized REL-clauses: Ute

4.3.3.5.1 Preamble: Nominalization and non-finiteness

A verbal clause is nominalized most commonly when it occupies a prototypically nominal (noun phrase) position inside another clause. As a diachronic process, nominalization may be defined as:

(32) **Nominalization as a syntactic process:**
"Clause nominalization is the process via which a finite **verbal clause**, either in its entirety or only its subject-less **verb phrase**, is converted into a **noun phrase**".

The syntactic structure of an NP that arises via nominalization tends to reflect the structure of its precursor verbal clause – plus the structural adjustments that come with the nominalization process itself. As part of these adjustments, the erstwhile verb assumes the syntactic role of **head noun**, while other clausal constituents – subjects, objects, verbal complements or adverbs – assume the roles of **modifiers**. Nominalization is thus best described as a process of syntactic adjustment from the finite verbal-clause prototype to the nominal (noun phrase) prototype (Hopper and Thompson 1984; Givón 2001, ch. 2). The major components of such adjustment are:

(33) **Adjustment from finite verbal-clause prototype to noun phrase prototype:**
a. The verb becomes a head noun.
b. The verb acquires nominal morphology.
c. The verb loses tense-aspect-modal marking.
d. The verb loses pronominal agreement marking.
e. The subject and/or object assume genitive case-marking.
f. Determiners may be added.
g. Adverbs are converted into adjectives.

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10. The diachrony of Modern Hebrew REL-clauses is rather complex, harkening back to Biblical Hebrew. For details see Givón (2015a, ch. 10).

A simple example will illustrate the pattern emerging out of (33) above, contrasting the finite clause in (34a) below with its nominalized counterpart (34b):

(34) a. **Finite verbal clause**:
         She **knew** mathematics exhaustively
      b. **Non-finite nominalized clause**:
         Her exhaustive **knowledge** of mathematics

It is of course not an accident that finiteness has been treated traditionally as a property of verbs, since four of its salient features (33a,b,c,d) pertain to the verb. But the other three features (33e,f,g) pertain to other constituents of the clause. Finiteness is thus an aggregate grammatical property of *clauses*, rather than a single either/or feature of verbs. And its converse, non-finiteness, is an aggregate of grammatical property of NPs that are derived – historically, transformationally or analogically, depending on one's theoretical perspective – from verbal clauses.[11]

4.3.3.5.2 **Ute REL-clauses**

Many languages can nominalize clauses at least in some contexts, but some languages practice nominalization to the extreme, so that all their subordinate clauses are nominalized. Tibeto-Burman (Watters 1998), Turkic, Cariban (Gildea 1998), Quechuan (Weber 1996), Gorokan (Papuan Highlands; Thurman 1978) and No. Uto-Aztecan display this extreme type. In Ute (Numic, No. Uto-Aztecan), three features of clause nominalization, a sub-set of (33) above, are used:

- genitive case-marking on the subject
- nominal suffix on the verb
- object case-marking on the entire clause

Ute is a flexible-order nominative language, marking consistently the distinction between subject and non-subject, with the latter conflating the object and genitive roles. Oblique – indirect – objects are marked by post-positions.

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11. Most of the syntactic relations between clauses, taken to be synchronic 'transformations' by Harris (1956) and Chomsky (1957, 1965), turn out to have a considerable diachronic provenance. This is analogous to Chomsky and Halle's *Sound Patterns of English* (1968), which turned out to have been, largely, an unintended recapitulation of the history of English phonology.

Short-distance anaphora in Ute chained clauses is coded mostly by *zero*, with clitic anaphoric pronouns used only sporadically and not yet consolidated into obligatory pronominal agreement (see ch. 2).

Ute REL-clauses, like all its subordinate clauses, are nominalized, with subject and object REL-clauses marked by two distinct nominal suffixes. Thus, compare (Givón 2011):

(35) a. **Main clause**:
mamach<u>i</u> t<del></del>p<del></del>ychi t<del></del>ka'nap<del></del>-**vwan** wac<del></del>-ka
woman/s rock/o table/o-**on** put-ANT
'the woman put the rock on the table'.

  b. **Restrictive subject REL-clause**:
mamach<u>i</u> [Ø] t<del></del>p<del></del>ychi t<del></del>ka'nap<del></del>-**vwan** wac<del></del>-ka-**t<del></del>**…
woman/s rock/o table/-**on** put-PERF-**NOM/S**
'the woman who put the rock on the table…'
(hist.: 'the woman putter of the rock on the table…')

  c. **Restrictive object REL-clause**:
t<del></del>p<del></del>ych<u>i</u> mamach**i** t<del></del>ka'nap<del></del>-**vwan** [Ø] wac<del></del>-ka-**na**…
rock/s woman/**G** table/o-**on** put-PERF-**NOM/O**
'the rock that the woman put on the table…'
(hist.: 'the rock of the woman's putting on the table…')

The case-role of the zeroed-out argument inside the REL-clause, for subject or direct object, is thus recoverable from the nominalizing suffix, with the missing argument left zero-marked.

When the zeroed-out argument inside the REL-clause is a post-positional (oblique) object, the same object-nominalizer suffix *-na* is used. In addition, the post-positional case-marker of the zeroed-out argument is suffixed to the REL-marker *p<del></del>-*, making the case-role explicit:

(36) **Restrictive indirect-object REL-clause**:
  a. t<del></del>ka'nap<u></u> **p<del></del>**-vwan mamach**i** t<del></del>p<del></del>ychi wac<del></del>-ka-**na**…
table-S **REL-on** woman/**G** rock/o put-ANT-**NOM**
'the table **on which** the woman put a rock…'
(Hist.: 'the table of the woman's putting the rock on…')

  b. wiich<u>i</u> **p<del></del>**-m 'áapach**i** 'ivichi ch<u>a</u>qhavi'na-qa-**na**…
knife/s **REL-with** boy/**G** stick/o cut-ANT-**NOM**
'the knife **with which** the boy cut the stick…'
(hist.: 'the knife of the boy's cutting the meat with…')

    c.   na'achichi̱ **pʉ-wa**   mamachi wʉʉka-qha-**na̱**…
        girl/s   **REL-with** woman/G work-ANT-**NOM**
        'the girl with whom the woman worked…'
        (hist.: 'the girl of the woman's working with…')

But how do nominalized clauses become restrictive post-nominal modifiers? The most likely answer is that they arrived at their post-nominal position as **non-restrictive** – parenthetical – clauses. Thus, compare:

(37) **Non-restrictive REL-clauses:**
    a. **Subject**:
        mamachi̱, **'ú**   tʉpʉychi tʉka'napʉ-**vwan** wacʉ-ka-**tʉ**…
        woman/s **that/s** rock/o   table/o-**on**   put-PERF-**NOM**
        'the woman, the one who put the rock on the table,…'
        (Hist.: 'the woman, *that* putter of rock on the table,…')
    b. **Direct object**:
        tʉpʉychi̱, **'uru**   mamachi tʉka'napʉ-**vwan** wacʉ-ka-**na̱**,…
        rock/s   **that/o** woman/G table/o-**on**   put-PERF-**NOM**
        'the rock, the one that the woman put on the table,…'
        (Hist.: 'the rock, *that* of the woman's putting on the table,…')
    c. **Indirect object**:
        tʉka'napʉ, **'uru**   **pʉ-vwan** mamachi tʉpʉychi wacʉ-ka-**na̱**,…
        table/s   **that/o REL-on** woman/G rock/o   put-ANT-**NOM**
        'the table, that one on which the woman put the rock,…'
        (Hist.: 'the table, that of the woman's putting the rock on,…')

What is more, the nominalized construction used in non-restrictive REL clauses can stand on its own as a subject or object nominal inside another clause; that is, as a **headless REL-clause**; as in, respectively:

(38) **Headless REL-clauses:**
    a. **Subject**:
        'ú   tʉpʉychi tʉka'napʉ-**vwan** wacʉ-ka-**tʉ**   mamachi̱ 'u
        that/s rock/o   table/o-**on**   put-PERF-**NOM** woman   the
          'ura-'ay
          be-IMM
        'the one who put the rock on the table is the woman'
        (hist.: '*that* putter of rock on the table is the woman')

b.   **Direct object**:
'uru   mamach**i** t**ɨ**ka'nap**ɨ**-vwan wac**ɨ**-ka-**na**
that/O woman/**G** table/O-on   put-PERF-**NOM**
       t**ɨ**p**ɨ**ych**i̱** 'ura-'ay
       rock   be-IMM
'what the woman put on the table is a rock'
(Hist.: '*that* of the woman's putting on the table is a rock')

c.   **Indirect object**:
ka-p**u̱**chucugwa-wa 'uru   **p**ɨ**-vwan mamach**i** t**ɨ**p**ɨ**ychi
NEG-know-NEG   that/O **REL-on**   woman/**G** rock/O
       wac**ɨ**-ka-**na**-y
       put-ANT-**NOM**-O
'(I) don't know what the woman put the rock on'
(hist.: ' I don't know *that* of the woman's putting the rock on')

Our Ute data thus illustrate a second major diachronic pathway by which a paratactic clause transforms into a syntactic – embedded – REL-clause, with the paratactic precursor here being an asserted non-restrictive clause, originally a headless REL-clause. And as in Bambara and Hittite, the transformation from non-restrictive to restrictive REL-clauses commences with a merger of the erstwhile-separate intonation contours (Mithun 2006, 2007a, 2007b, 2009).

4.3.3.6 Case-marked demonstrative pronouns and Y-movement: German

German REL-clauses illustrate a parataxis-to-syntaxis diachronic development similar to that of Ute, where the immediate paratactic precursors to restrictive REL-clauses are non-restrictive clauses. However, the case-role recoverability strategy used in German is different, and the entire diachronic process may be reconstructed as follows:

- A **Y-movement** construction, with a case-marked **stressed demonstrative pronoun**, is still extant in German.
- That Y-movement clause was inserted post-nominally as a parenthetic clause, following an intonation break, thus yielding a paratactic **non-restrictive** REL-clause.
- The two intonation contours then merged and the demonstrative de-stressed, yielding the syntactic **restrictive** REL-clause.

As an illustration, consider (Theo Vennemann, Charlotte Zahn, Christa Toedter, Tania Kuteva, i.p.c.; see also Heine and Kuteva 2007):

(39) a. **Simple clause**:
Martin hat **dem**   Mann **das**   Buch gegeben
M.   has **the/DAT** man   **the/ACC** book given
'Martin gave the book to the man'.

b. **Y-movement clause – NOM**:
DER   hat das   Buch dem   Mann gegeben
THAT/NOM has the/ACC book the/DAT man   given
'*That one* gave the book to the man'.

c. **Y-movement clause-ACC**:
DAS   hat Martin dem   Mann gegeben
THAT/ACC has Martin the/DAT man   given
'*That one* Martin gave to the Man'.

d. **Y-movement-DAT**:
DEM   hat Martin das   Buch gegeben
THAT/DAT has Martin the/ACC book given
'*To that one* Martin gave the book'.

(40) **Non-restrictive (parenthetical) REL-clauses:**
a. **Nominative**:
Ich kenne die Frau,   **DIE**   hat dem   Mann
I   know   the woman, **THAT/NOM** has the/DAT man
    das   Buch gegeben.
    the/ACC book given
'I know the woman, the one who gave the book to the man'.
(Hist.: 'I know the woman. *that one* gave the book to the man').

b. **Accusative**:
Ich kenne das Buch, **DAS**   hat Martin dem
I   know   the book, **THAT/ACC** has Martin the/DAT
    Mann   gegeben.
    man   given
'I know the book, the one that Martin gave to the man'.
(Hist.: 'I know the book, *that one* Martin gave to the man').

c. **Dative**:
Ich kenne den   Mann, **DEM**   hat Martin das
I   know   the/ACC man, **THAT/DAT** has Martin the/ACC
    Buch gegeben.
    book given
'I know the man, the one that Martin gave the book to'.
(Hist.: 'I know the man, *that one* Martin gave the book to').

By removing the intonation break, de-stressing the demonstrative pronoun and
affecting a minor adjustment in word-order, the non-restrictive REL-clauses in

(40) are turned into the corresponding restrictive REL-clauses in (41) below. Respectively (and ignoring the fact that in written German a comma must still separate restrictive REL-clauses, a relic of the older paratactic pattern):

(41) **Restrictive REL-clauses:**

a. **Nominative**:

Ich	kenne	die	Frau	**die**		dem	Mann	das	
I	know	the	woman	**that/NOM**	the/DAT	man		the/ACC	

Buch gegeben hat.
book given has

'I know the woman who gave the book to the man'.

b. **Accusative**:

Ich	kenne	das	Buch	**das**		Martin	dem	Mann
I	know	the	book	**that/ACC**	Martin	the/DAT	man	

gegeben hat.
given has

I know the book that Martin gave to the man'.

c. **Dative**:

Ich	kenne	den		Mann	**dem**		Martin	das		Buch
I	know	the/ACC	man	**that/DAT**	Martin	the/ACC	book			

gegeben hat
given has

'I know the man to whom Martin gave the book'.

The same diachronic pathway is also found in other Germanic languages (Old Norse, Old English; Heine and Kuteva 2007).

The natural logic of selecting the Y-movement clause as the paratactic precursor to non-restrictive and then restrictive REL-clauses is that the latter, much like Y-movement, is a **topicalizing construction**. The use of the stressed demonstrative pronouns in non-restrictive REL-clauses is almost entirely predicted from the conflation of two core attributes of the precursor Y-movement clause:

● The demonstrative pronoun refers to an **anaphoric** antecedent
● The demonstrative pronoun also signals **switch-reference**

In the course of re-analysis, the second feature is dispensed with, leaving the case-marked demonstrative to function as the case-role recoverability strategy in the REL-clasuse.

The initial stressed demonstrative in its original Y-moved capacity is well suited for its new function (Linde 1979), and it is not an accident that demonstrative pronouns are so widespread as REL-clause subordinators in languages as diverse as the clause-chaining and verb-serializing Bambara and Hittite,

the finite-embedding German or Bantu; or the nominalizing-embedding Ute, where such demonstratives are optional in restrictive REL-clauses but near-obligatory in non-restrictive ones (as well as in headless REL-clauses). The only languages where this strategy is less likely are zero-anaphora languages like Japanese or Mandarin.

4.3.3.7 The verb-coding relativization strategy

4.3.3.7.1 Preliminaries

The Keenan and Comrie (1972, 1977) accessibility hierarchy derives its main empirical support from this type of REL-clauses. With some restrictions, this type owes its existence to the fact that in some language the promotion of non-subjects in main clauses, either to the role of subject (by passivization) or direct object (by the applicative), results in marking the verb for the case-role of the 'promoted' argument. We will illustrate this relativization strategy with one Philippine language, Bikol, and one Bantu language, KinyaRwanda.

4.3.3.7.2 Coupling relativization to passivization: Bikol

The interpretation of Philippine languages as nominative-accusative, with the 'topic-prefix' '*ang-* on the noun marking it as subject and the verb prefix *nag-* tagging the clause as the direct-active clause, is questionable, and the system is most likely a relatively-young 'deep ergative' system.[12]

The semantic case-role of the subject noun in Bikol (when interpreted as a nominative language) is morphologically coded on the verb. This is true for the agent subject of the active clause as well as for the non-agent subjects of the various 'passives'. Thus, consider (Manuel Factora, i.p.c.):

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12. See Schachter (1976). A similar misinterpretation probably applies to Keenan's (1976b) description of Malagasy as a nominative language. "Deep" ergative languages (Dixon 1972; Anderson 1977) are those where not only the morphology is ergative-absolutive, but also syntactic processes such as relativization are controlled by the ergative-absolutive distinction. In "shallow" ergative languages, on the other hand, syntactic processes ('behavior and control properties') are controlled by the nominative-accusative distinction. This difference is probably a matter of diachronic age of the ergative system. "Shallow" ergative systems are older, whereby the behavior-and-control property have had time to revert to nominative-accusative control. "Deep" ergative system are most likely diachronically younger (Givón 2001, ch. 4).

(42) a. **Agent-topic ('active voice'):**
     nag-ta'o '**ang**-lalake ning-libro sa-babaye
     AGT-give TOP-man   PAT-book DAT-woman
     'The man gave a book to the woman'

     b. **Patient-topic ('passive-1'):**
     na-ta'o   kang-lalake '**ang**-libro sa-babaye
     PAT-give AGT-man   TOP-book DAT-woman
     'The book was given to the woman by the man'

     c. **Dative-topic ('passive-2'):**
     na-ta'o-**an**   kang-lalake ning-libro '**ang**-babaye
     DAT-give-DAT AGT-man   PAT-book TOP-woman
     'The woman was given a book by the man'

(43) a. **Agent-topic ('active voice'):**
     nag-putul '**ang**-lalake ning-tubu gamit(-'ang)-lanseta
     AGT-cut   TOP-man   PAT-cane   INSTR-knife
     'The man cut sugar-cane with a knife'

     b. **Instrument-topic ('passive-3'):**
     pinag-putul kang-lalake ning-tubu '**ang**-lanseta
     INSTR-cut   AGT-man   PAT-cane TOP-knife
     'The knife was used by the man to cut sugarcane'

(44) a. **Agent-topic ('active voice'):**
     nag-bakal '**ang**-lalake ning-kanding **para**-sa-babaye
     AGT-buy   TOP-man   PAT-goat   BEN-DAT-woman
     'The man bought a goat for the woman'

     b. **Benefactive-topic ('passive-4'):**
     pinag-bakal-**an** kang-lalake ning-kanding '**ang**-babaye
     BEN-buy-DAT   AGT-man   PAT-goat   TOP-woman
     'The woman was bought a goat by the man'

To gain verb-coding of semantic role of the missing co-referent argument in REL-clauses, two restrictions are imposed in Bikol:

(45) **Relational constraints on relativization in Bikol:**
     a. Only subject REL-clauses can be formed.
     b. Passivization (promotion to subject/topic) is a prerequisite to relativization.

These constraints, coupled with the verb-coding of the subject's semantic role in main clauses, effectively transfers the verb-coding strategy of Bikol from main clauses to REL-clauses. Thus (Manuel Factora, i.p.c.):

(46) a. **Agent REL-clause:**
marai 'ang-lalake **na** **nag**-ta'o ning-libro sa-babaye
good TOP-man REL AGT-give PAT-book DAT-woman
'The man who gave a book to the woman is good'

b. **Patient REL-clause:**
marai 'ang-libro **na** **na**-ta'o kang-lalake sa-babaye
good TOP-book REL PAT-give AGT-man DAT-woman
'The book that was given to the woman by the man is good'

c. **Dative REL-clause:**
marai 'ang-babaye **na** **na**-ta'o-**an** kang-lalake ning-libro
good TOP-woman REL DAT-give-DAT AGT-man PAT-book
'The woman that was given a book by the man is good'

d. **Instrument REL-clause:**
marai 'ang-lanseta **na** **pinag**-putul kang-lalake ning-tubu
good TOP-knife REL INSTR-cut AGT-man PAT-cane
'The knife that the man to cut sugarcane with is good'

e. **Benefactive REL-clause:**
marai 'ang-babaye **na** **pinag**-bakal-**an** kang-lalake
good TOP-woman REL BEN-buy-DAT AGT-man
    ning-kanding
    PAT-goat
'The woman for whom the man bought a goat is good'

The subject-only restriction on relativization, one of the two typological mainstays of the Keenan-Comrie accessibility hierarchy (13), is found only in languages that gain verb-coding in passivization, such as Philippine languages or their close Austronesian relatives (e.g. Toba-Batak or Malagasy). This rather restricted cross-language distribution reinforces the suspicion that the restriction is not motivated by some universal structural hierarchy, as in (13), but rather by the more mundane functional consideration of **case-role recoverability** (section 4.3.3.1, above).[13]

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13. Fox (1987) attempted to resurrect the Keenan-Comrie approach on more substantive grounds, suggesting that the restriction reflected some universal properties of discourse-functional organization. Fox neglects to explain, however, in what way the small group of Austronesian languages that abide by the "subject only" constraint differ from the vast majority of languages that don't. Citing a 'universal' constraint that is instantiated, mysteriously, in only a few languages is somewhat incoherent.

4.3.3.7.3 Relativization, promotion to direct object and the "direct-object-only" constraint: KinyaRwanda

As noted earlier, the coding of the semantic role of non-subject arguments on the verb may be done in some languages through promotion to direct object ('dative shifting', 'applicative'). Much as in the case of passivization, this grammatical process can be then exploited in relativization, yielding a coherent case-role recoverability strategy. In this case, the strategy pertains to only object REL-clauses, since only non-subject arguments can gain verb-coding of their semantic role via promotion to DO.

Language that utilizes the promotion-to-DO system in relativization impose relational constraints on relativization that is analogous to those seen in Bikol, above:

(47) **Relational constraints on relativization:**
   a. Of non-subject arguments, only the **direct objects** can be relativized.
   b. In order for an **indirect object** to become the co-referent argument in the REL-clause, it must be first promoted to DO.

We will illustrate this strategy with KinyaRwanda, first reproducing the data showing its system of promotion to DO (Kimenyi 1976):

(48) **Locative:**
   a. **DO = patient:**
   umugore ya-ooher-eje umubooyi **ku**-isoko
   woman   3s-send-ASP   cook   **LOC**-market
   'The woman sent the cook to the market'
   b. **DO = locative:**
   umugore y-ooher-eke-**ho**   isoko   umubooyi
   woman   3s-send-ASP-**LOC**   market cook
   'The woman sent to the market the cook'

(49) **Instrument:**
   a. **DO = patient:**
   umugabo ya-tem-eje igiti **n**-umupaanga
   man   3s-cut-ASP   tree   **INSTR**-saw
   'The man cut the tree with a saw'
   b. **DO = instrument:**
   umugabo ya-tem-ej-**eesha**   umupaanga igiti
   man   3s-cut-ASP-**INSTR**   saw   tree
   'The man used the saw to cut the tree'

(50) **Manner:**

    a. **DO = patient**:

        Maria ya-tets-e   inkoko **n**-agahiinda

        Mary 3s-cook-ASP chicken MANN-sorrow

        'Mary cooked the chicken regretfully'

    b. **DO = manner**:

        Maria ya-tek-**an**-ye   agahiinda inkoko

        Mary 3s-cook-MANN-ASP sorrow   chicken

        'Mary regretfully cooked the chicken'

(51) **Associative:**

    a. **DO = patient**:

        umuhuungu ya-riimb-jye ururiimbi **na**-umugore

        boy   3s-sing-ASP song   ASSOC-woman

        'The boy sang the song with the woman'

    b. **DO = associative**:

        umuhuungu ya-riimb-**an**-ye   umugore ururiimbi

        boy   3s-sing-ASSOC-ASP woman   song

        'The boy sang with the woman a song'

In the case of one semantic role, the dative/benefactive, promotion to DO is obligatory:

(52) **Dative-benefactive (obligatory promotion):**

    a. *****DO = patient**:

        *Yohani y-ooher-eje ibaruwa **ku**-Maria

        John   3s-send-ASP letter   DAT-Mary

    b. **DO = dative-benefactive**:

        Yohani y-ooher-**er**-eje   Maria ibaruwa

        John   3s-send-BEN-ASP Mary letter

        'John sent Mary a letter'

In subject and direct-object REL-clauses, no verb-coding occurs. One may argue, further, that a word-order case-role recoverability strategy, similar to that of English, is at work here:

- NP-V = subject REL-clause
- NP-NP-V = object REL-clause

That is:

(53) a. **Subject REL-clause**:
　　 umugabo **u**-a-kubis-e　　　　abagore…
　　 man　　　**3s/REL-PA-hit-ASP**　women
　　 'the man who hit the women…'

　 b. **Patient-DO REL-clause**:
　　 abagore umugabo y-a-kubis-e…
　　 women　man　　　3s-PA-hit-ASP
　　 'the women that the man hit…'

In indirect-object relativization, the non-patient object must be first promoted to DO, and thus gain verb-coding of its semantic case-role:

(54) a. **Locative REL-clause**:
　　 isoko　　umugore y-ooher-eke-**ho**　umubooyi…
　　 market　woman　 3s-send-ASP-**LOC**　cook
　　 'The market the woman sent the cook to…'

　 b. **Instrument REL-clause**:
　　 umupaanga umugabo ya-tem-ej-**eesha**　igiti…
　　 saw　　　　man　　　3s-cut-ASP-**INSTR**　tree
　　 'The saw the man cut the tree with…'

　 c. **Manner REL-clause**:
　　 agahiinda　Maria ya-tek-**an**-ye　　　　inkoko
　　 sorrow　　 Mary　3s-cook-**MANN**-ASP chicken
　　 'the regret with which Mary cooked the chicken…'

　 d. **Associative REL-clause**:
　　 umugore umuhuungu ya-riimb-**an**-ye　　　ururiimbi…
　　 woman　 boy　　　　3s-sing-**ASSOC**-ASP　song
　　 'The woman with whom the boy sang the song…'

　 e. **Dative-benefactive REL-clause**:
　　 umugore Yohani y-ooher-**er**-eje　　 ibaruwa…
　　 woman　 John　 3s-send-**BEN**-ASP　letter
　　 'the woman that John sent the letter to…'

Wherever one finds the direct-object-only restriction on object relativization, it always involves a language where promotion to DO ('applicative') yields **verb-coding** of the semantic role of the promoted object. Because of the obligatory coupling of promotion to DO and relativization, the semantic role of the missing co-referent argument in object REL-clauses is verb-coded in such a language. The second empirical main-stay of the Keenan-Comrie accessibility hierarchy (13), the preferred accessability of DO over IO, thus turns out to also

be motivated not by an abstract structural hierarchy, but rather by the same functional consideration as the subject-only restriction in Bikol – the need to recover the semantic case-role of the zeroed-our argument in REL-clauses.

4.4   Discussion

The typological prediction about the use of the verb-coding as a case-role recoverability strategy in REL-clause formation may be recapitualted as follows:

(55)   **Prediction concerning the subject-only and DO-only restrictions in relativization:**
"A language will impose the SUBJ-only or DO-only restriction on relativization only if it gains verb-coding of the case-role of the promoted argument in passivization or in promotion to DO, respectively. And if, in addition, it makes passivization or promotion to DO a prerequisite to relativization".

The purely-structural Keenan-Comrie (1972, 1977) accessibility hierarchy (13), as well as its severe typological limits, thus turn out to be one more example of how an apparent structural universal turns out, upon closer inspection, to be motivated by fairly transparent – and indeed universal – functional principles. In the process, the complex interaction between syntactic structure, communicative function and cross-language typological diversity is further illuminated.

Abbreviations of grammatical terms

2sf	2nd person singular feminine	LOC	locative
3s	3rd person singular	MANN	manner
3sf	3rd person singular feminine	NEG	negative
3sm	3rd person singular masculine	NOM	nominative, nominalizer
ACC	accusative	O	object
AGT	agent	OBJ	object
ANT	anterior	PA	past
ASSOC	associative	PAT	patient
BEN	benefactive	PERF	perfect
CONJ	conjunction	PTC	particle
DAT	dative	REL	relative marker
DO	direct object	S	subject
G	genitive	SUBJ	subject
IMM	immediate	TOP	topic
INSTR	instrumental		

From discourse to syntax: Grammar as an automated processing strategy

5.1   Introduction[1]

In this chapter we turn to consider one of the grand themes in the diachrony, acquisition and evolution of grammar – the rise of syntactic structures out of pre-grammatical communication.[2] This theme is, in a way, the developmental counterpart of the grand synchronic theme surveyed in the preceding chapters – that syntactic structure is not arbitrary, but rather is motivated by communicative function. One is thus tempted to ponder a question that was first broached by Erica García (1979): If the syntax of human language is there to perform various communicative functions, and if it rises out of discourse and remains strongly motivated by it, does syntactic structure have an independent reality, above and beyond discourse structure? Or isn't syntax, rather, a predictable derivative of discourse?

In the late 1970's, the orthodox Generative approach, *independent syntax*, seemed untenable for two reasons:

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1.   The original version of this chapter marked my first explicit attempt to add more explanatory parameters to the functional-adaptive, typological, diachronic perspective on language. Most conspicuously, I tried to enrich the mix with considerations of language processing and automaticity, as well as the striking parallels between child language development, L2 acquisition, the Pidgin-Creole continuum, language diachrony, the spoken-written continuum, and language evolution. It also marked my re-inventing the term *grammaticalization*, in blissful ignorance of Meillet (1921); and of *automated processing*, in equal ignorance of the cognitive literature. Lastly, it constituted my first systematic attempt to enlarge the scope of grammaticalization beyond the traditional focus on morpho-genesis (Givón 1971), to include the genesis of syntactic constructions out of pre-grammatical paratactic discourse.

2.   The title of this chapter owes much to Sankoff and Brown's (1976) "The origins of grammar in discourse".

- **Methodological**: Independent syntax considered only an artificially-restricted range of data, pre-sanitized by Chomsky's distinction between *competence* and *performance*.
- **Theoretical**: Independent syntax was largely indifferent to explaining why the grammar of human language is the way it is.

What García (1979) suggested was that syntactic structures *per se* did not really exist, so that human language could be described exhaustively by reference to only the cognitive and communicative principles that underlie its use. García thus viewed syntax as an *artifact* whose apparent solidity was due to the solidity of its underlying – presumably universal – functional principles.

One problem with García's position was already noted, implicitly, in Chapters 1 and 4, above. It concerns the cross-language diversity of the syntactic structures that code the same functional domain. For if García was right about universal cognitive and communicative principles, why was there all that syntactic diversity?

In this chapter I hope to show that there are enough facts to support the mental reality of the language-processing instrument called syntax – a.k.a. grammar. And that just like elsewhere in biological design, syntax is a *motivated* structural entity whose formal properties and complex genesis must not only be described but also explained.[3]

The range of data I will consider here spans four **developmental trends** whose striking parallels, and thus seeming underlying kinship, demands explanation:

(1) a. **Diachrony**: loose, flat parataxis > tight, hierarchic syntaxis
    b. **Ontogeny**: pre-grammatical communication >
                                    grammatical communication
    c. **Creology**: pre-grammatical Pidgin > grammatical Creole
    d. **Register**: unplanned oral discourse > planned/edited
                                          written text

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3. The parallels with functional explanation in biology, beginning with Aristotle's work in *De Partibus Animalium* (see ch. 1), did not occur to me till ten years later (Givón 1989). More recently, biologists have been coming to a better appreciation of the fundamental unity of developmental trends (West-Eberhard 2004), in a way thus vindicating Haeckel (1874) far beyond Gould (1977).

Some of these trends have been noted in the earlier literature. Thus, (1c) has been discussed by Sankoff and Brown (1976) and Bickerton and Odo (1976a,b). The parallels between (1a) and (1b) have been suggested by Slobin (1977). And the interaction between (1b) and (1d) has been discussed by Ochs (1979). This chapter is intended as a step towards a grand synthesis.

5.2 The diachrony of syntacticization

5.2.1 Overview

Multiple case-studies in diachronic syntax share a common theme, describing a process by which flat, paratactic discourse-pragmatic structures transform over time into tight, hierarchic syntactic structures. In each case, one may construct the balance sheet of communicative gains and losses accrued through this process of **syntacticization**. The principles that control the balance of gain and loss are the ultimate topic of this investigation.

If language diachrony constantly converts flat paratactic structures into hierarchic syntactic structures, one would expect languages to become, over time, increasingly syntactic and complex. But in fact this doesn't happen. Rather, another process, just as well motivated, erodes syntactic structures over time, primarily through the gradually attrition of their attendant morphology, eventually leveling syntactic constructions back down to ground zero. The demise of syntactic structures is just as well-motivated as their rise, yielding a rise-and-fall cycle that may be given as, roughly (Givón 1971):

(2) **The Diachronic Cycle**:
    parataxis > morpho-syntax > eroded morphology >
                back to ground zero

The first step in this cycle most often involves two tightly-coupled processes, both motivated by communicative goals:

- The genesis of syntactic constructions; and
- The parallel rise of the grammatical morphology that codes them.

The subsequent demise of syntactic structures, primarily through the erosion of their attendant morphology, is motivated by the speed of natural oral communication, which leads to assimilatory reduction and phonological attrition.

5.2.2 **From topic to subject**

A number of recent studies have dealt with the relationship between the discourse-pragmatic notion of 'topic' and the syntactic category 'subject'.[4] Keenan's (1976a) pioneering work showed that most subject functional properties are 'referential' topic properties (the small residue being agent properties). Li and Thompson (1976) and Schachter (1976, 1977) raised the possibility that some languages are more 'subject prominent' while others more 'topic prominent'. If I were to interpret this idea in a way that would make some empirical sense, I would suggest that what was at issue was the **degree of grammaticalization**. Subjects are grammaticalized topics; and as in other domains of syntax, grammaticalization is a matter of degree.

In an earlier study (Givón 1976), I suggested that subject pronominal agreement was, fundamentally, a property of topical referents in discourse, and that it arose as part of the diachronic conversion of the pragmatic category 'topic' into the grammatical category 'subject'. As a schematic illustration, consider:

(3) | **paratactic input** | | **syntactic output** |
|---|---|---|
| My ol' man, **he** rides with the Angels | > | My ol' man **he**-rides with the Angels |

The input construction in (3) is the paratactic L-dislocation, falling under two separate intonation contours. The output is a syntactic clause falling under a unified intonation contour. In the process of such condensation, the topic is not lost, but is simply *grammaticalized* as subject. That is, it gains Keenan's (1976) more-structural subject properties. And as Sankoff (1976) noted, such grammaticalization is so natural that one language, Tok Pisin, has undergone three successive cycles of such grammaticalization within 100 years.

The communicative balance sheet for the rise of grammaticalized subjects out of pre-grammatical topics may be given as follows. On the gain side, first:

- **Processing speed**: Syntactic subject constructions under a single intonation contour are processed faster than the corresponding topic constructions under separate intonation contours.

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4.   The temporal reference here is to the late 1970s.

- **Error rate**: Subject constructions are more elaborately and precisely coded than topic constructions, with multiple grammatical properties – case-marking, word-order, pronominal agreement, government and control constraints. One would thus expect them to be processed with lower error rates.

  On the loss side there is, perhaps:
- **Loss of functional specificity**: Ca. 5–10% of grammatical subjects are not topical, most conspicuously the subjects of *object topicalizing* constructions (object L-dislocation, Y-movement, object cleft). So the inference from grammatical subject to discourse topic during language processing incurs some leakage.

The fact that grammaticalization keeps recurring again and again following the cyclic erosion of grammatical constructions (2) strongly suggests that our balance sheet tips toward the gains column. What is more, when a language gains a grammaticalized subject, it doesn't lose the precursor topic construction. Thus in English:

(4) a. **Grammaticalized subject**: … and she slapped Bill real hard and…
    b. **Subject L-dislocated**: As for Mary, she slapped Bill real hard, then…
    c. **Object L-dislocated**: As for Bill, Mary slapped him real hard, then…
    d. **Y-movement**: … *Bill* she never slapped, tho…

What is more, grammaticalized subject constructions are used in different discourse contexts than paratactic topic constructions. Thus, the grammatical subject construction in (4a) is used in mid-chain contexts of high referential continuity; the L-dislocation clauses in (4b,c) are used in chain-initial contexts of high referential discontinuity; and the Y-movement clause in (4d) is used in mid-chain contexts of switch-reference (see ch. 2).

5.2.3 From topicalization to passivization

As noted earlier (chs 1, 4), in some Bantu languages the L-dislocation construction has given rise to a new passive construction, where the L-dislocated object has become the grammatical subject of the passive clause. Thus, revisiting the Kimbundu data (Charles Uwimana, i.p.c.):[5]

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5. In Kimbundu, Lunda and related Bantu languages, the old Bantu passive construction with the suffix *-iwa /-ewa* has been eroded. For an extensive discussion see Givón (2015a, ch. 14).

(5)		**Object L-dislocation**			**Passive**			
a.	Nzua,	**a**-mu-mono	⇒	Nzua	a-**mu**-mono	(kwa	meme)	
	John	**they**-him-saw		John	they-**him**-saw	by	me	
	'John, they saw him'			'John was seen (by me)'				
b.	meme,	**a**-ni-mono	⇒	meme	a-**ni**-mono	(kwa	Nzua)	
	I	**they**-me-saw		I	they-**me**-saw	by	John	
	'as for me, they saw me'			'I was seen (by John)'				

In the process, the old plural subject agreement pronoun *a-* 'they' has become an invariant marker of the new passive clause, while the old object pronoun (*mu-*, *ni-*) now functions as the obligatory subject agreement of the new passive. The paratactic L-dislocation clause under two separate intonation contours has thus condensed into a syntactic passive clause under a single intonation contour. And all the while the old L-dislocation construction remains in use, as in:

(6) Nzua, aana **a**-mu-mono
John children **they**-him-saw
'John, the children saw him'

5.2.4 From conjoined clauses to embedded relative clause

Earlier above (ch. 4) we discussed the genesis of REL-clauses in Bambara, Hittite, Hebrew, Ute, and German. These languages displayed different REL-clause types, defined in terms of the strategy used to recover the case-role of the zeroed-out argument inside the REL-clause. Nonetheless, these five structural types had one conspicuous common denominator – the embedded REL-clause, falling under a joint intonation contour with its main clause, arose diachronically from a paratactic construction in which the two clauses fell under *separate* intonation contours. As a reminder, let us re-consider the REL-clauses of Bambara and Hittite.

In Bambara (Mendeic, Niger-Congo) one finds a paratactic un-embedded REL-clause construction, as in (7a,b) below. The semantic REL-clause and the main clause fall under separate intonation contours, much like normal conjoined/chained clauses. Inside the semantic REL-clause, the demonstrative *min* ('that') modifies the co-referent noun. Inside the semantic main clause, the normal anaphoric pronoun is used (*o* 's/he', 'it' in (7) below), just like in normal anaphora in chained clauses. And further, the 'topic clause' – the semantic REL-clause – can be either pre-posed (7a) or post-posed (7b) to the semantic main clause. Thus (Bird 1968; Ibrahima Coulibaly i.p.c.):

(7) a. **Conjoined-paratactic pre-posed 'topic clause':**
    ce   **min** ye muru san, n ye **o**   ye.
    man REL PA knife buy I PA **him** see
    'the man *that* bought the knife, I saw him'.
    (Lit.: '*That* man bought the knife, (and) I saw him'.)

  b. **Conjoined-paratactic post-posed 'topic clause':**
    n ye **o**   ye,   ce   **min** ye muru san.
    I PA **him** see, man REL PA knife buy
    'I saw him, the man *that* bought the knife'.
    (Lit.: 'I saw him, (and) *that* man bought the knife'.)

Bambara also affords the option of embedding the REL-clause inside the main clause, in two different configurations. In the first variant, (8a) below, the entire would-be REL-clause functions as an NP (here the subject) inside the main clause. In the second (8b), conventional-seeming embedding occurs. Either way, the two clauses fall under a joint intonation contour, and the anaphoric pronoun in the semantic main clause is dispensed with. Thus compare:

(8) a. **Embedded REL-clause:**
    [n ye ce   **min** ye] ye muru san.
    I   PA man REL see PA knife buy
    'The man *that* I saw bought the knife'.
    (Lit.: 'I saw *that* man bought the knife'.)

  b. **Embedded REL-clause:**
    n ye   ce   **min** [[ø] ye muru san] ye.
    I PAST man REL   PA knife buy see
    'I saw the man *who* bought the knife'.
    (Hist.: 'I, *that* man bought the knife, saw (him)'.)

A remarkably similar development can be seen in Hittite. In Old Hittite, both clauses, in a paratactic (conjoined/chained) construction, are marked with a conjunction, as in (Probert 2006):[6]

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6. The Hittite writing system used no punctuation marks, but one can assume the two conjoined clauses fell under separate intonation contours, given the presence of the normal double-conjunction marking. See further discussion in Givón (2015a, ch. 26).

(9) a. **nu ku**-**it** LUGAL-uš teez-zi, **nu** apaa-at luzzi
    CONJ REL-**ACC** king-NOM say-3s **CONJ** that-ACC L.
        karap-zi
        do-3s
      'whatever the king says, that the Luzzi shall perform'.

    b. kuuša-ta-**ma** **ku**-**it** píddaa-i, **na**-aš-kan
      bride-price-PTC-**CONJ** **REL**-**ACC** give-3s **CONJ**-he-PTC
        šameen-zi
        forfeit-3s
      'what(ever) bride-price he gave, he forfeits (it)'.

The conjunction may be dropped from the first clause, yielding an emphatic focus construction:

(10) **ku**-**iš** pa-apreez-**zi**, **nu** apaa-aš-pat 3 gín
    REL-**NOM** be-impure-**3s** **CONJ** that-NOM-PRT three shekel/ACC
     ku.babbar paa-**i**
     silver pay-**3s**
    'whoever is impure, *that very one* shall pay three silver shekels'.

In Late Hittite, the second conjunction may also be dropped, and – if the pause is also dispensed with – one now has, to all intent and purpose, an embedded REL-clause falling under a joint intonation contour with its main clause, as in:

(11) pa-apreez-**zi** **ku**-**iš**, 3 gín ku.babbar paa-**i**
    be-impure-**3s** **REL**-**NOM** three shekel silver pay-**3s**
    'the one who is impure, (he) pays three silver shekels'.

About the presence vs. absence of the conjunction, and its connection to the diachronic evolution of Hittite REL-clauses, Probert (2006) observes:

> "… The distinction between sentences with both [conjunctions] and sentences with neither points to a structural distinction between adjoined [paratactic] and embedded [syntactic] relative clauses. After Old Hittite, it is no longer necessary for the resumptive [main] clause to include either both resumption [explicit anaphoric pronouns] and conjunction…." (2006, p. 17; bracketed material added).[7]

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7. A similar re-analysis from paratactic – conjoined/chained – to embedded syntactic REL-clauses has been reported in Yuman languages (Langdon 1977), Tok Pisin (Sankoff and Brown 1976), Wappo (C. Li and S. Thompson, i.p.c) and elsewhere (see further discussion in ch. 4). A more comprehensive treatment of this topic was undertaken many years later (Givón 2009, Chapter 4; 2015a, ch. 25).

5.2.5 **From conjoined to embedded verb complements**

Like REL-clauses, embedded verb complements that fall under a joint in-tonation contour with their main clauses often arise from paratactic configu-rations in which the two finite clauses fall under separate intonation contours. This is the case of equi-subject complements of modal-aspectual verbs in Greek, Slavic, Athabaskan and other languages. Such complement clauses appear to be fully finite, displaying the same pronominal agreement and tense-aspect mark-ing as simple main clauses. Indeed they appear much like chained equi-subject clauses. Thus, from Tolowa Athabaskan:[8]

(12) a. **Main clause (IMPERF):**
           nn-tʉ-sh-'į̃
           2s-TH-1s-observe
           'I observe you'
      b. **Main clause (PERF):**
           nn-tee-s-ii-'į̃-'
           2s-TH-PERF-1s-observe-PERF
           'I observed you'
      c. **V-complement (implicative, IMPERF):**
           nn-tʉ-sh-'į̃   xa-sh-tɬ-sri
           2s-TH-1s-observe   INCEP-1s-L-do
           'I begin to observe you' (Lit. 'I begin-do I observe you')
      d. **V-complement (implicatie, PERF):**
           nn-tee-s-ii-'į̃-'   xaa-gh-íi-ɬ-srį̃
           2s-TH-PERF-1s-observe-PERF INCEP-PERF-1s-L-do/PERF
           'I began to observe you' (Lit.: 'I began-did I observed you')

While the main and complement clauses in (12c,d) fall now under a joint in-tonation contour, there is no reason to assume they are not the product of an earlier chained – paratactic – configuration, with the two finite clauses falling under separate intonation contours. Otherwise, the finite structure of the com-plement clause is hard to explain.

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8. The original data in the 1979 version cited an example from Palestinian Arabic. It was legitimate as far as it went, but the verb 'want' used in that exam-ple is *nominalized* in Arabic, with a suffixal *genitive subject* conjugation (*b-idd-i* 'in my wish', *b-idd-ak* 'in your wish', *b-idd-u* 'in his wish', etc.). It thus differs, technically, from the finite prefixal verb conjugation in the complement clause. For the Tolowa data, I am indebted to Loren Bommelyn (i.p.c.); see also Givón (2001, ch. 11).

In the same vein, Heine and Kuteva (2007) note that in Germanic languages the complements of cognition-perception verbs such as 'know' or 'see', currently using the unstressed ex-demonstrative subordinator 'that', arose from a paratactic configuration in which the precursor *stressed* demonstrative was the nominal object of the main verb. That is, schematically:

(13)   I saw **THAT**, he came ⇒ I saw **that** he came

Likewise, the most common verbal complement of cognition-perception verbs in Early Biblical Hebrew falls under a joint intonation contour with its main clause. The subordinator used in such complements is *ki*, as in (14a) below, probably a reflex of the old preposition *k-*. Less commonly, however, one finds another subordinator, *ve-hine* 'and-lo' or 'and be', as in (14b) below, suggesting an earlier stage where the complement clause was conjoined, thus falling under a separate intonation contour. Consider (Givón 1991c):

(14)   a.   va-yar'   'elohim 'et-'asher ʕasa   **ki**   ṭov
           and-saw/3sm God   ACC-REL made/he **SUB** good/sm
           'and God saw all that he all he had done was good' (Gen. 1:4)
           (Hist. 'and God saw what he had done, (and) that it was good')

       b.   va-yar'   'elohim 'et-kol 'asher ʕasa   **ve-hineh**
           and-saw/3s God   ACC-all REL   made/3s **and-lo**
              ṭov   mɨ'od
              good/sm   very
           'and God saw all he had made, and lo it was very good' (Gen. 1:31)
           (Hist.: 'and God saw all that he had done, and lo, it was very good')

In addition, both (14a,b) bear another relic of the paratactic-to-syntactic shift: the verb 'see' in both takes a double object, first a nominal object marked with the definite-accusative preposition '*et-*, then the verbal complement clause subordinated by *ki-* or *ve-hineh*. The diachronic process here, of condensing the paratactic precursor into syntactic construction, is thus similar to the Germanic case in (13) above.

5.2.6   Resultative verb compounds in Mandarin

Thompson (1973) described resultative verb compounds in Mandarin Chinese, as in:[9]

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9.   With the Mandarin tones left unmarked.

(15) ta   la-kai   le   men
     s/he pull-open ASP door
     's/he pulled the door open'

Zero anaphora is routinely used in Mandarin for both subject and object re-
curring referents (see ch. 2). And the most likely precursor of the syntactic
construction in (15) is a paratactic conjoined/chained configuration, as in (16)
below, with both zeros standing for 'it'. That is, schematically:

(16) she pulled [ø], and [ø] opened the door ⇒ she pull-opened the door
     'she pulled it, and opened the door'   'she pulled the door open'

5.2.7 Complex possessive constructions

In a number of languages, a complex possessive construction exist, as in:[10]

(17) a. **Krio**:
       Jon   hin-os
       John   his-house
       'John's house' (Hist. 'John, his house')
   b. **English**:
       John's house (Hist.: 'John, his house')
   c. **Hebrew**:
       bet-o   shel-Yosef
       house-his of-Joseph
       'Joseph's house' (Hist.: 'His house, Joseph's)
   d. **Late Biblical Hebrew**:
       karm-i   shel-i lo'   naṭar-ti
       vineyard-1s of-1s NEG guard/PERF-1s
       'My own vineyard I didn't guard' (Song of Solomon, 1:6)
       (Hist.: 'My vineyard, mine, I didn't guard')

The only plausible diachronic source of this syntactic construction is either
a paratactic L-dislocation construction that topicalizes the possessor noun
(17a,b), or an R-dislocation construction that topicalizes the possessed noun
(17c,d).

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10. The Krio example is from Sori Yilla (i.p.c.).

5.2.8 Focus clauses and wh-questions

In many languages, there is evidence suggesting that syntactic cleft clauses and WH-questions, currently falling under a single intonation contour, arose from an earlier paratactic configuration under two separate intonation contours. Thus, from Kihungan (Bantu; Takizala 1972):

(18) a. **Syntactic cleft-focus**:
          kwe kít   ki   a-swiim-in   Kipes
          be   chair that 3s/REL-buy-PA K.
          'It's *a chair* that Kipes bought'

      b. **Paratactic cleft-focus**:
          kwe kít,   kiim ki   a-swiim-in   Kipes
          be   chair thing DEM 3s/REL-buy-PA K.
          'It's a chair, the thing that Kipes bought'

      c. **Syntactic WH-question**:
          khí   Kipes ka-swiim-in?
          what Kipes 3s-buy-PA
          'What did Kipes buy?'

      d. **Paratactic WH-question**:
          kwe khí,   kiim ki   a-swiim-in   Kipes?
          be   what thing DEM 3s/REL-buy-PA K.
          'It's what, the thing that Kipes bought?'

What is more, the WH pronoun *khí* 'what' in (18c,d) can be reconstructed back to *n-kí*, with the initial *n-*, found in the WH pronouns of most core-Bantu languages, reconstructed back to the old Niger-Congo copula *ni*. This suggests a cleft-like paratactic source for WH-questions in Bantu languages.[11]

5.2.9 From clause-chaining to serial-verb clauses

Serial-verb constructions, found in languages of East Asia (Li and Thompson 1973a,b), West Africa (Stahlke 1970; Hyman 1971; Givón 1975a), Papua-New Guinean (Pawley 1991; Givón 1991b) and many others, are used systematically to enrich case-marking systems, as in (Stahlke 1970):[12]

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11. Schachter (1973) suggested a similar but synchronic ('underlying') REL-clause analysis of cleft and WH-question constructions in Tagalog and English.

12. With the tones left unmarked.

(19) a. **Accusative (Nupe)**:
   u **la**   duku la
   he **take** pot break
   'He broke the pot' (lit. 'he took the pot and broke (it)'

   b. **Instrumental (Yatye)**:
   iywi **awa** otsi iku utsi
   boy **took** stick shut door
   'the boy shut the door **with** a stick'
   (lit.: 'the boy took the stick and shut the door'

   c. **Locative (Nupe)**:
   u bici **lo** dzuka
   he ran **go** marked
   'he ran **to** the market' (lit. 'he ran and went to the market')

   d. **Dative-Benefactive (Yoruba)**:
   mo mu iwe **wa**   **fun** o
   I   took book **come** **give** you
   'I brought a book **for** you'
   (lit.: 'I took a book and came and gave you')

In the same vein, Li and Thompson (1973a) noted that the passive clause in Mandarin Chinese comes from a serial-verb construction, as in:[13]

(20) Zhang-san **bei**   Li-si piping   le
   Z.-S.   **suffer** L.-S. criticize ASP
   'Zhang-san was criticized by Li-si'
   (lit.: 'Zhang-san suffered (when) Li-si criticized (him)')

The only plausible diachronic account of the rise of such syntactic constructions, currently falling under a single intonation contour, is that they originated from paratactic clause-chaining configurations under separate intonation contours.[14]

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13. Ditto.

14. Pawley (1976, 1987) has suggested that serial-verb clauses are still 'mentally' (synchronically) chained, depicting two separate events. I find his argument less than convincing (Givón 1991b; see also Givón 2015a, ch. 23).

5.2.10 **Interim summary**

In the preceding sections I suggested that many – and by extension perhaps all – complex, tight-packed, hierarchic syntactic constructions arose diachronically from flat paratactic configurations, through the process of **syntacticization.** Earlier on I also suggested that the grammatical morphology that marks syntactic constructions arises out of lexical words as part of the very same diachronic process (Givón 1971). This is reminiscent of Sankoff and Brown's (1976) idea of the genesis of syntax out of discourse.

It is perhaps in order now to note that human communication can proceed via two modes of processing, a developmentally older pre-grammatical mode, and its diachronic derivative syntactic (grammaticalized) mode. A diachronically mature language displays both, with the pre-grammatical mode continuously replenishing eroded syntactic constructions. These two modes of communication may be characterized as follows:

(21)

	pre-grammatical processing	**syntactic/grammatical processing**
	structural properties:	
a.	topic-comment constructions	subject-predicate constructions
b.	loose clause-chaining	tight subordination
c.	multiple intonation contours	unified intonation contour
d.	flexible pragmatic word-order	rigid grammatical word-order
e.	nearer 1:1 noun-to-verb ratio in text	higher noun-to-verb ratio in text
f.	paucity of grammatical morphology	extensive grammatical morphology
	functional properties:	
g.	slower, attended processing	faster, automated processing
h.	higher error rate	lower error rate

In the following sections I will suggest that this dichotomy crops up, either fully or partially, in three other developmental trends in human communication:

- Pidgin vs. Creole language
- Early childhood vs. adult language
- informal-oral vs. formal-written language

5.3 Pidgin vs. Creole language

Pre-grammatical L2 Pidgin is acquired in adulthood. Grammaticalized Creoles are created by the children of pidgin-speaking adults (Bickerton 1981). The contrast between the two is nearly identical with the contrast between pre-grammatical vs. grammatical language processing (20), respectively.

Indeed, in a sense the Pidgin-to-Creole developmental trend is a sub-case of the diachrony of grammaticalization – with one important caveat: The early grammatical constructions of a Creole are created *at one phase* by the first generation of native-speaking children,[15] themselves children of the Pidgin-speaking generation (Bickerton 1975; Givón 1975c). The main features of Pidgin communication are:

(22) **Structural features of pidgin communication:**
- absence of grammatical morphology
- absence of complex-hierarchic subordinate clauses
- complexity only through clause chaining (conjunction)
- short clauses with near 1:1 verb-to-noun ratio
- transparent topic-comment structure but weak subject-predicate structure
- ample use of stress and intonation
- shorter thematic units (clause-chains, paragraphs) and frequent topic shifting
- slower processing rate with much repetition, back-filing and correction

A transcript of Japanese-English Pidgin narrative from Hawaii will illustrate some of these features:[16]

(23) Oh me?… Oh me over there… nineteen-twenty over there say come.. store me stop begin open… me sixty year… little more sixty year… now me ninety… na ahem… little more… this man ninety-two… yeah, this month over… me Hawaii come [desu]… nineteen-seven

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15. This observation only applies to the first generation of Creoles. Once the language has been established as a grammaticalized instrument of communication, further grammaticalization proceeds as in any mature language with a protracted diachronicy.

16. Courtesy of D. Bickerton; see also Bickerton and Odo (1977a,b), Givón (2009, ch. 9).

> come… me number first here… me [wa] tell… you sabe gurumeru?…
> you no sabe gurumeru?… yeah this place come… this place been
> two four five year… stop, ey… then me go home… Japan… by-m-by
> wife hapai ('carry')… by-m-by… little boy… come… by-m-by he
> been come here… ey… by-m-by- come… by-m-by me before Huihui
> stop… Huihui this… eh… he.. this a… Manuel… you sabe [ka]?…

With virtually no grammatical morphology or hierarchic embedded con-
structions, Pidgin communication is extremely context-dependent. It is used
primarily in face-to-face communication among familiars, and most commonly
deals with here-and-now, you-and-I, and this-and-that referents grounded in
the current speech situation. Not surprisingly, these features are the same as
those that characterize early childhood communication.

5.4   Child vs. adult language

Early childhood pre-grammatical communication, at the age of ca 1–2
years, resembles in all major respects pre-grammatical Pidgin communica-
tion (Gruber 1967; Bloom 1973; Ochs 1974a,b, 1975a,b; Bates 1974, 1976;
Scollon 1974, 1976; Ochs and Schieffelin 1976; Greenfield and Smith 1976;
inter alia).[17] In the same vein, the great context-dependence of early childhood
pre-grammatical communication is substantially the same as that of L2 Pidgin
communication.

Ochs (1979) has pointed out that both the structural features of early child-
hood communication (22) and the communicative context change gradually,
in tandem. It is also well known that adult care-givers down-shift their register
substantially, so that their language often mimics the child's pre-grammatical
Pidgin. As an illustration of this, consider:[18]

(24)   NINA: Big.
      MOTHER: Yeah.
      NINA: Big crocodile
      MOTHER: Big crocodile. It sure is.
      NINA: Rabbit. Little rabbit.

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17.   The growth of the literature in this burgeoning field has been explosive. For
more discussion of early childhood pre-grammatical Pidgin, see Givón (2009,
chs 6, 7, 8).

18.   For details see Givón (2009, ch. 7)

MOTHER: That's a little rabbit.
NINA: On a bicycle.
MOTHER: Oh, is the rabbit riding on a bicycle?
NINA: Yeah.
MOTHER: What is the Rabbit doing?
NINA: Fall down.

At the same time, the adult care-giver also pushes the child, gradually but systematically, toward increased expansion and elaboration. This is already evident in the two questions the mother directs at Nina in (24) above. Further examples of this can be seen in:[19]

(25) EVE: Napkin.
       MOTHER: Oh, do you want a napkin?
       EVE: Fraser blow nose, blow nose.
       MOTHER: Wipe your nose? Can you blow?
       EVE: Bottle?
       MOTHER: What?
       EVE: Eve…
       MOTHER: Do you want to taste it? Let's see if Sarah would like to have
                 a drink.
       EVE: Eve want some too. Eating bread too.
       MOTHER: She is eating bread too, I think.
       ***
       FATHER: What are you doing?
       EVE: Have shower hat.
       FATHER: Well, I know you are wearing a shower hat.
       EVE: Eve wearing shower hat.
       ***
       EVE: Got barking.
       RICK: He got what?
       EVE: Got barking.
       MOTHER: There is a dog barking outside… yeah.
       RICK: I'm not sure. Yea, I think it is. I'm sure it is. Instead of saying
                 'dog' she says 'got'.
       EVE: Got eating bread too.

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19. *Ditto.*

Pre-grammatical Pidgin communication is, in a way, the most universal communicative mode in the human arsenal. The obvious evolutionary implications of this will be discussed in a subsequent chapter.

5.5   Oral informal speech vs. formal written discourse

The contrast between informal oral communication and formal oratory or written text parallels, most conspicuously at the text-frequency level, the Pidgin-Creole and child-adult contrasts, respectively, as summarized in (21) and (22) above. Ochs (1979) used the terms planned vs. unplanned discourse to elucidate this contrast – or continuum.[20] In the Generative tradition, this contrast often boils down, at least implicitly, to our old scourge, *performance* vs. *competence*, whereby consciously-produced illustrative 'competence' examples, either well-written or well-planned, correspond to the formal written genre. Spontaneous spoken language, on the other hand, is considered sloppy and careless, reflecting 'performance factors' that are irrelevant to the theory of grammar.

Since language has evolved as an oral mode of communication, is acquired early on orally, is used orally by most speakers most of the time, and changes diachronically primarily during oral communication, the Generative obsession with reflective, out-of-context, artificially-produced 'competence' data is not only puzzling, it is eminently silly as well as profoundly counter-empirical.[21]

Ochs (1979) noted the strong parallels between early childhood communication and unplanned, spontaneous oral discourse, summarizing the salient features of the latter as follows:

(26) **Spontaneous oral discourse:**
   a.   frequent topic-comment constructions
   b.   frequent repetitions and pauses
   c.   slower information-processing rate
   d.   reduced or simplified grammatical morphology
   e.   on-the-fly production with little long-distance planning
   f.   face-to-face monitoring with strong dependence on gesture, facial expression and intonation.
   g.   strong dependence on the shared immediate context
   h.   communication about here-and-now, you-and-I, and situationally-accessible referents

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20. See also several contributions in Ochs and Bennett (eds 1977).

21. For an extensive survey of the Platonic-Saussurean-Chomskian idealization, see ch. 1.

In addition, Ochs (1979) also noted that most adults, especially educated ones, are in one sense profoundly *bilingual*, capable of using either communicative mode – and points in-between along a continuum. This parallels closely the diachronic observation, above, that speakers revert to the pre-grammatical communication in order to re-grammaticalize – *di-novo* – eroded grammatical constructions.

As an illustration of the profound frequency-distribution difference between oral and written language, consider the following comparison between two authors – the low-brow Western writer Louis L'Amour, and the hyper-literate academic Noam Chomsky. At the qualitative level, compare first two typical passages:

(27) a. **L'Amour (1962, p. 1):**

"For seven days in the spring of 1881 the man called Shalako heard no sound but the wind…

No sound but the wind, the creak of his saddle, the hoofbeats of his horse.

Seven days riding the ghost trail up out of Sonora, down from the Sierra Madre, through Apache country, keeping off the sky lines, and watching the beckoning fingers of the talking smoke.

Lean as a famished wolf but wide and thick in the shoulder, the man called Shalako was a brooding man, a wary man, a man who trusted to no fate, no predicted destiny, nor to any luck. He trusted to nothing but his weapons, his horse, and the caution with which he rode."

b. **Chomsky (1968, p. 69):**

"Every animal communication system that is known (if we disregard some science fiction about dolphins) uses one of two basic principles: Either it consists of a fixed, finite number of signals, each associated with a specific range of behavior or emotional state, as is illustrated in the extensive primate studies that have been carried out by Japanese scientists for the past several years; or it makes use of a fixed, finite number of linguistic dimensions in such a way that selection of a point along the linguistic dimension determines and signals a certain point along the associated non-linguistic dimension."

The frequency distribution of one grammatical variable, subordinate vs. main clauses, in the usage of these two writers is given in table (28) below:[22]

(28) **Frequency distribution of main/conjoined vs. subordinate clauses in two English texts:**

academic non-fiction (Chomsky)				low-brow fiction (L'Amour)			
main/conjoined		subordinate		main/conjoined		subordinate	
N	%	N	%	N	%	N	%
43	36	77	**64%**	120	**86%**	20	14%

The written, well-planned register is the quintessential communicative mode of the mass **Society of Strangers**, and is well motivated by the need to communicate with non-intimates about displaced referents, time and place. In contrast, the oral, informal, spontaneous register evolved – and is still used – as the preferred communicative mode of the **Society of Intimates**, in small face-to-face social groups of familiars, thus with a high degree of shared context.[23] The fact that humans are capable of both communicative modes is testimony to our cognitive and cultural evolution – and flexibility. The fact that the grammatical/syntactic mode of communication invariably arises out of the pre-grammatical Pidgin mode is testimony to human developmental universals.

5.6 Discussion

5.6.1 Coding modalities and developmental trends

The four main concrete coding devices that, combined, make up grammar are:

- syntactic word order
- hierarchic phrase structure
- grammatical morphology
- intonation

Of the four, only one, intonation, is attested in both modes of communication – pre-grammatical pidgin and grammaticalized language (in written language, as punctuation). The other three emerge through development, be it diachrony,

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22. From Givón (1991a).

23. For further discussion of the contrast between the Society of Intimates and the Society of Strangers, see ch. 7, below, as well as Givón (2009, ch. 11).

first-language acquisition (where Creolization is a special case), or language evolution. The fact that these three developmental trends share their core features suggests a shared cognitive, neurological, and ultimately genetic substratum. And this in turn is reminiscent of the recent convergence of phylogeny and development in evolutionary biology (West-Eberhard 2004).

The genesis of grammar also echoes a major theme in cognitive neuroscience – the rise of streamlined, fast-paced automated processing (see below). In the genesis of grammar, via evolution, ontogeny or diachrony, variable word-order becomes rigid and thus more predictable; flat paratactic structures become hierarchic syntactic structures, and grammatical morphemes are added to syntactic constructions as automated processing clues.

5.6.2   The diachronic cycle

The early phase of the diachronic cycle involves two parallel processes that are carried on in tandem:

- the rise of grammatical morphology out of lexical words; and
- the rise of hierarchic syntactic structures out of flat paratactic configurations.

These two – morphogenesis and syntacticization – are the twin ingredients of **grammaticalization**. They don't only rise together, but also fall together under the impact of the phonologically-driven erosion of grammatical morphology.

5.6.3   Diachrony and typological diversity

While the three developmental trends – diachrony, ontogeny and evolution – may be ultimately connected in some fashion, it is the first one – diachrony – that bears the main responsibility for creating the extant diversity of synchronic grammars. Consequently, diachrony also carries the bulk of the explanatory load of how the grammar of particular languages has come to be the way it is. Diachrony thus both explains and constrains the typological diversity of human languages.

5.6.4   Universality, evolution and explanation

By saying that various features of grammar are universal one concedes that they are genetically determined, thus innate, thus evolved. But invoking innateness or genetics does not by itself explain evolution; it only re-brands the term. Language evolution still remains to be explained.

5.6.5 Grammar as an automated processing strategy

One may view the rise of rigid word-order, grammatical morphology, complex hierarchic structure and rigid rules and constraints as the genesis of a more streamlined, habituated **automated language processing**. With such a development, one gains higher processing speed, lower error rates and lower dependence on the vagaries of context, be it situational, generic-cultural or the current discourse. The relatively small loss of resolution is more than offset by the manifest gains in efficiency. To loop back to the beginning of this chapter, Erica García's suggestion of 'discourse-without-syntax' has turned out to be neither empirically viable nor theoretically revealing.[24] Syntax is cognitively real, it does arise, through protracted development in diachrony, ontogeny and evolution. And it therefore begs for a systematic explanation, hopefully one with broad-enough cross-disciplinary scope, given the multiple strands that link language to communication, neuro-cognition, culture, diachrony, acquisition and evolution.

5.6.6 Postscript

My use of the term 'automatic processing' in the late 1970s was a fortuitous guess made in total ignorance of the vast literature in cognitive science, accumulating since the late 1960s, on the interplay between conscious/attended and unconscious/automated processing. Soon after the publication of the first edition of this book in 1979, a colleague at the Kinesiology department, Diane Shapiro, introduced me to her and Richard Schmidt's work on the development of automated motor schemata (Schmidt 1975, 1980; Shapiro 1978; Shapiro and Schmidt 1980), and then to the seminal works of Posner and Keel (1968), Posner and Snyder (1974), Schneider and Shiffrin (1977) and Posner (1978). As early as I could (Givón 1981a), I acknowledged my post-hoc indebtedness to this grand tradition in cognitive science, eventually also noting how the work of Herbert Simon on complexity as hierarchy (Simon 1962), and of Simon and his associates on chunking in expert memory (Chase and Simon 1973; Chase and Ericsson 1982), fit snugly into the overall framework of habituated, automated processing.

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24. García's position is eerily reminiscent of Chomsky's (1992) rejection of the reality of concrete syntactic construction, deeming them ephemeral methodological conveniences. Given García's oft-professed anti-Chomskian stance, I can only hope this suggestion does not impel her to turn wrathfully in her grave.

Abbreviation of grammatical terms

1s	1st person singular	L	L-classifier
2s	2nd person singular	NEG	negative
3s	3rd person singular	NOM	nominative
3sm	3rd person singular masculine	PA	past
sm	singular masculine	PERF	perfect
ACC	accusative	PTC	particle
ASP	aspect	REL	relative marker
CONJ	conjunction	SUB	subordinator
DEM	demonstrative	TH	theme
INCEP	inceptive	WH	WH-question marker

Where does crazy syntax come from?

6.1 Introduction[1]

In the preceding chapter we considered the genesis of grammatical constructions via syntaticization, a process that takes as its input loose paratactic structures under separate intonation contours and condenses them into tightly-packed, hierarchic syntactic structures under a single intonation contour. As noted there, grammatical constructions rise and fall; and while their rise and fall are equally natural, they are driven by different adaptive imperatives. The rise of grammatical constructions is motivated by communicative goals. Their erosion and eventual demise are driven by the phonological attrition of their attendant morphology.

In this chapter we will investigate the processes by which successive natural diachronic changes can introduce increased irregularity into synchronic syntactic paradigms, to the point where their communicative efficacy is eventually destroyed. It is of course true that such irregularities have their use in the method of *Internal Reconstruction*, allowing the linguist to track the process of diachronic change.[2] However, our interest here is not in reconstructing the process of change, but rather in observing some of its less-than-salutary effects on grammar as an instrument of communication.

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1. The original version of this chapter, written in 1976, was prompted by an ongoing discussion of naturalness in phonology. In retrospect, the data surveyed here bear most directly on the grammaticalization cycle (see chapter 5). That is, on the rise and fall of grammatical constructions. The original chapter registered my indebtedness to Dwight Bolinger, Robert Hetzron and Winfred Lehmann, all long gone, for helpful comments and suggestions. I would also like to acknowledge my indebtedness to Larry Hyman's paper at the LSA Winter Meeting in San Diego (December 1973) "How do natural rules become unnatural?", which prompted me to see the obvious parallels between historical phonology and diachronic syntax.

2. See extensive discussion in Greenberg (2000) and Givón (2000). The 19th Century comparativists employed *Internal Reconstruction* for a different purpose – to clean up irregularities in the synchronic paradigms before they could be used, via the *Comparative Method*, to reconstruct temporally-remote proto-forms.

The diachronic changes that pile up one on top of the other to produce synchronic irregularity are largely independent of each other, and are motivated by different – if equally natural – adaptive imperatives. At the tail end of a sequence of changes one finds constructions that, from the perspective of the language user and or language learner, look bizarre and unnatural. More often than not, such constructions seem to defy the iconic ideal of 1:1 correlation between form and function.[3] The successive changes that give rise to such irregularities abide by purely local goals, and are blind to the global consequences left in their wake.

Given that a language at any given point in time is in the midst of many independently-motivated diachronic changes, a fundamental question arises concerning our notion of **naturalness in syntax**:

(1) "If synchronic grammars are indeed the by-product of natural diachronic change, and if bizarre, counter-natural synchronic states arise repeatedly via the accretion of perfectly natural, adaptively-motivated changes, how exactly do we come by our notion of naturalness in syntax?"

Question (1) is lodged at the very heart of the complex interaction between our two traditional ways of viewing language: First as a relatively solid object the speaker can rely on at the moment of making communicative decisions. And second, as a shifty object in the midst of flux – during deployment by the *very same* speaker at the *very same* instance of communication.

It is not an accident that the data of synchronic variation in the speech of individuals and communities – Chomsky's *performance* slop – overlap massively with the data of diachronic change. For as Bill Labov has taught us, variation and change march hand in hand. This mundane fact is somewhat embarrassing to hyper-structuralists like Saussure and Chomsky, who insist on idealizing the data and in the process ignoring both the inherent variability of synchronic

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3. The iconicity literature of the 1980s (Haiman 1985; Haiman ed. 1985; *inter alia*) was still a few years around the corner when this chapter was originally written. Only much later did I learn that the very same phenomenon – gradual accretion of small, adaptively-motivated local changes that yield messy global end results – is well known in biological evolution, giving rise to *spandrels*, *excess structure*, and on occasion extravagant Rube Goldberg-like organisms that, from an engineering point of view, are truly bizarre. The operating principle in evolutionary biology, much like in diachronic syntax, is that of *terminal addition*, the piling up of local innovations one on top of the other, in total oblivion of their eventual global consequence.

usage and the ever-present diachrony in the midst of synchrony. Consider again the unholy muddle in Saussure's attempt to justify the strict segregation between diachronic flux and synchronic steady state. Saussure notes first that such segregation can only be achieved through a large dose of *abstraction* from real speech data:[4]

> "…In practice a language-state is not a point but rather a certain span of time during which the sum of modifications that have supervened is minimal… Studying a language-state is in practice disregarding **changes of little importance**… In static linguistics, as in most science, no course of reasoning is possible without the usual **simplification of the data**…." (1915, p. 101–102; boldfacing added)

Unlike Chomsky, whose *competence* remains a theoretical jewel in the Generative crown, Saussure never makes it clear whether his 'simplification' was meant as a *methodological* gambit – say, like isolated variables and controlled experiments in science – or as a *theoretical* construct. And he then goes on to repeatedly subvert the distinction, as in:

> "…That is why I could state that knowing how *Gentlemen!* retains its identity when repeated several times during a lecture is just as interesting as knowing why *pas* (negation) is identical to *pas* (noun ['step']) in French, or again why *chaud* ['hot'] is identical to [the Latin] *calidum*… The second problem is really just an extension and a complication of the first…" (1915, p. 182; bracketed material added)

The most vexing issue lurking beneath Saussure's muddled surface is, of course, the notion 'changes of little importance'. How can one determine what changes are important? As Aristotle and countless pragmatists after him could have reminded Saussure, 'importance', like 'relevance' or 'similarity', are context-dependent notions, a matter of perspective, lodged in the proverbial eye of the beholder.

It is symptomatic that in selecting his two diachronic examples in the second quotation above, Saussure chose first a grammatical change (*pas*) that began seven centuries earlier and had been consolidated and done with for centuries, where the two forms are identical only as *written*, and where neither

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4. One must again note that the *Course* was not written by Saussure himself, so that the muddle may well be due to the two former students who assembled the books from class notes, then edited and published it three years after Saussure's death (see ch. 1).

the native speaker nor the linguist have ever had any reason to consider them synchronic variants. Saussure's second example, of a phonological 'variation' (*chaud*), spans more than a millennium.

Saussure's 'changes of little importance', those minute unobtrusive ripples of synchronic variation that he suggests we can safely ignore, turn out to sit the very heart of diachronic change. And it is their piling up in succession, one on top of the other, that produces the bizarre, unnatural-seeming synchronic consequences we will survey below.

Unlike Saussure's muddled hedge and Chomsky's theory-laden idealization, Bloomfield seems to have considered the segregation of synchrony from diachrony, at least implicitly, a matter of methodological convenience:

> "…We can study linguistic change only by comparing related languages or different historical stages of the same language…" (1933, pp. 16–17)

The long-distance comparativist bias of the 19th Century's Grand Tradition is evident in what Bloomfield chose to ignore: First, the study of low-level synchronic variation in the same language; and second, the grammaticalization-cum-internal-reconstruction work of Bopp, Meillet and Jespersen.

6.2   Crazy synchronic phonology

The phenomenon we will survey here is not limited to grammar, but has been observed earlier in phonology, where the succession of perfectly natural sound changes often lead to a rather bizarre end product. While my inspiration here was Hyman's (1973) paper, I will illustrate the phenomenon with some run-of-the-mill Swahili data.

In Swahili, a number of phonological changes, all mundane and unimpeachably natural, applied in succession, first to the consonant /g/ and then to the sound sequence /ki/, most conspicuously the *ki-* noun prefix (class 7/8 sg.):

(2) a. **Voiced consonant lenition**: g > zero / V – V
     b. **Gliding**: ki > ky /---V
     c. **Palatalization**: k > ch /---y
     d. **Glide swallowing**: y > zero /ch---

The gliding rule /ki/>/ky/ (2b) had one, equally natural, exception – it does not apply before the stem vowel /i/. The resulting synchronic distribution of noun forms is illustrated in:

(3)

old form	intermediate form	current form	gloss
ki-gengo	ki-engo	chengo	'dwelling'
ki-gama	ki-ama	chama	'association'
ki-gupa	ki-upa	chupa	'bottle'
ki-gombo	ki-ombo	chombo	'instrument'
ki-gini	ki-ini	kiini	'kernel'

What is utterly bizarre about the synchronic distribution of current forms in (3) is, of course, that the most naturally palatalizing vowel /i/ does not palatalize /k/, while the non-palatalizing /o/, /a/ and /u/, and the less-palatalizing /e/, do. The sequence of four natural sound changes in (2), plus the natural exception in the case of /ki-i/, have thus produced a rather unnatural synchronic end product.

6.3   Case studies

6.3.1   The Kimbundu passive revisited

Let us re-consider the Kimbundu passive construction described earlier above (chs 1, 5). Its paratactic source, recall, was the object L-dislocation construction, coupled to the impersonal use of the subject pronoun 'they'. That is, to begin with:

(4)   Nzua, aana   **a-mu**-mono
       John, children **they-him**-saw
       'John, the children saw him'

L-dislocation is one of the most universal, natural, iconic constructions known to linguists. I have yet to encounter a language that does not use it. And the subject and object pronominal agreement used in this construction is the most wide-spread agreement pattern in core-Bantu languages. Of the roughly 500 languages of this sub-family of Niger-Congo, distributed over the bulk of southern and eastern Africa, only a small cluster along the Zambia-Angola-Congo border display this peculiar passive construction. The rest retain the old suffix-marked promotional passive, as in Bemba:

(5)   abaana   **ba**-a-mon-**ewa**   (na Joni)
       children **they**-PA-see-**PASS** by   John
       'The children were seen (by John)'

But in the rather exceptional Kimbundu-type passive, the normal plural-subject pronoun 'they' (cl. 1/2) has become the invariant marker of the passive clause, while the normal object pronoun has become an exceptional subject agreement – but only in the new passive construction, as in (6a) below. The somewhat strange subject of the new passive can be itself now L-dislocation, as in (6b) below:

(6)   a.   **New passive clause**:
       Nzua **a-mu**-mono   (kwa   meme)
       J.   PASS-**he**-saw (by   me)
       'John was seen (by me)'

       b.   **L-dislocated subject of the new passive**:
       Nzua, **a-mu**-mono   (kwa   meme)
       J.   PASS-**he**-saw by   me
       'John, he was seen (by me)'

The reason why object L-dislocation (4) is a natural paratactic source for a syntactic passive construction (6a) is fairly transparent – both constructions topicalize the object, albeit in different discourse contexts. The order of successive diachronic changes in Kimbundu, all of them perfectly natural, was, presumably:

i.   Through highly natural diachronic processes, subject and object pronominal agreement evolved in proto-core-Bantu.[5]
ii.   For equally natural reasons, via phonological erosion of its morphology, the old Bantu passive was eroded and eventually lost in Kimbundu.
iii.   A highly natural replacement, the extant object L-dislocation construction, was then pressed into service to replenish the eroded passive.

Yet the resulting new passive is synchronically bizarre.

6.3.2   The Kihungan cleft and WH-question revisited

As noted by Schachter (1973) and others, the recruitment of a REL-clause structure to fashion cleft-focus and WH-question constructions is highly natural, given that in both constructions the bulk of the clausal information – excepting the pre-posed focused constituent – is presupposed, much like in a restrictive REL-clause. Further, the precursor paratactic construction in (7a) below, with a pre-posed focus constituent, is a highly natural, universal syntactic device; as is the paratactic non-restrictive REL-clause that follows the focused

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5.   See Givón (1976; 2017, chs 3, 4).

constituent; as is the minor simplification of deleting the semantically-empty head noun 'thing' in (7b) below; as is the merging of intonation contours in (7c); as is the next simplification in (7d), whereby both the semantically empty 'be' and the demonstrative are deleted. Thus, in sequence (Takizala 1972):

(7)   a.   **Paratactic source construction**:
      kwe kít, kiim ki   a-swiim-in   Kipes
      be   chair thing DEM **3s/REL**-buy-PA K.
      'It's a chair, the thing that Kipes bought'

   b.   **Paratactic construction simplified**:
      kwe kít, ki   a-swiim-in   Kipes
      be   chair DEM **3s/REL**-buy-PA K.
      'It's a chair, what Kipes bought'

   c.   **Condensed syntactic cleft construction**:
      kwe kít   ki   a-swiim-in   Kipes
      be   chair DEM **3s/REL**-buy-PA K.
      'It's a chair that Kipes bought'

   d.   **Syntactic cleft construction simplified**:
      kít   a-swiim-in   Kipes
      chair **3s/REL**-buy-PA K.
      'It's a chair that Kipes bought'

All the changes in (7) were perfectly natural. But put in succession, they resulted in two synchronic grammatical aberrations: First, in Kihungan as in many other core-Bantu languages, the third-person-singular subject-agreement pronoun for the human noun-class (1/2) is different in REL-clauses than in main clauses, either in tone or in segmental form or both. And second, Kihungan, like all core-Bantu languages, is a strict SVO language. But in object REL-clauses, the subject is post-posed (VS). And that exceptional order is imported from the REL-clause into the fully syntacticized cleft clause in (7d) above. Thus compare (Takizala 1972):

(8)   a.   **Main clause subject agreement with SVO order**:
      Kipes **ka**-swiim-in kit
      K.   **3s**-buy-PA   chair
      'Kipes bought a chair'

   b.   **REL-clause subject agreemen with VS order**:
      kit   ki   a-swiim-in   Kipes
      chair DEM **3s/REL**-buy-PA K.
      'the chair that Kipes bought'

The piling up of three perfectly natural diachronic changes in succession turns out to have produced two synchronic aberrations: An exceptional subject

pronoun, and an exceptional VS order in the syntactic cleft and WH-question that do not, synchronically, include a REL-clause any more. These aberrations have been cleaned out in the fully-syntactic, simplified WH-question pattern, where the normal main-clause subject agreement pattern and SV word-order are restored. Thus, compare the syntactic cleft (7d) above with the syntactic WH-question (9d) below (Takizala 1972):

(9) a. **Paratactic object WH question**:
    kwe khí, kit ki **a**-swiim-in Kipes?
    be what thing that **3s/REL**-buy-PA K.
    'it is what, the thing that Kipes bought?'

   b. **Paratactic WH-question simplified**:
    kwe khí, ki **a**-swiim-in Kipes?
    be what, that **3s/REL**-buy-PA K.
    'It's what, what Kipes bought?'

   c. **Condensed syntactic WH-Q construction**:
    kwe khí ki **a**-swiim-in Kipes?
    be what that **3s/REL**-buy-PA K.
    'It's what that Kipes bought?'

   d. **Syntactic WH-question fully simplified**:
    khí Kipes **ka**-swiim-in?
    what Kipes **3s**-buy-PA
    'What did Kipes buy?'

The Kihungan data demonstrate once again how crazy, unnatural syntax can arise from a sequence of perfectly natural diachronic changes. But it also shows that languages have the resources to clean up and simplify the mess and, over time, bring wild syntactic constructions back to a more natural synchronic state.

Subject post-posing in object-REL-clauses and other object-topicalizing constructions is found in other Bantu languages and elsewhere (Givón 1972). Indeed, object REL-clauses fall in with a whole family of *object-topicalizing* constructions – Y-movement, object REL-clause, object WH-question, object cleft – all of which often display the VS order, as in Classical Arabic, Biblical Hebrew, Spanish, German and more. The natural communicative principle underlying this variation was suggested by Vennemann (1973) in his depiction of German as a T-V-X language: If you topicalize a non-subject, the subject is de-topicalized, given that verbal clauses tend to have only one main topic. If a language has a modicum of pragmatically-controlled word-order flexibility, this principle manifests itself in the post-posing of subjects (VS) in object-topicalizing constructions.

6.3.3   German REL-clauses revisited

As noted earlier (ch. 4), the current syntactic REL-clause patterns of German were assembled from paratactic precursors in three main steps. First, German has a paratactic object-topicalizing Y-movement construction, with its characteristic stressed demonstrative pronoun, as in:

(10)   a.   **Simple clause**:
Martin hat **dem**   Mann **das**   Buch gegeben
M.   has **the/DAT** man   **the/ACC** book given
'Martin gave the book to the man'.

b.   **Y-movement – NOM**:
DER   hat das   Buch dem   Mann gegeben
THAT/NOM has the/ACC book the/DAT man   given
'*That one* gave the book to the man'.

c.   **Y-movement – ACC**:
DAS   hat Martin dem   Mann gegeben
THAT/ACC has Martin the/DAT man   given
'*That one* Martin gave to the Man'.

d.   **Y-movement – DAT**:
DEM   hat Martin das   Buch gegeben
THAT/DAT has Martin the/ACC book given
'*To That one* Martin gave the book'.

This Y-movement construction is highly natural and near universal.

Next, the Y-movement construction was recruited to form the paratactic non-restrictive REL-clause, as in:

(11)   **Non-restrictive (parenthetical) REL-clauses**:
a.   **Nominative**:
Ich kenne die Frau,   **DIE**   hat dem   Mann
I   know   the woman, **THAT/NOM** has the/DAT man
das   Buch gegeben.
the/ACC book given
'I know the woman, **the one** who gave the book to the man'.
(Hist.: 'I know the woman. *That one* gave the book to the man').

b.   **Accusative**:
Ich kenne das Buch, **DAS**   hat Martin dem
I   know   the book, **THAT/ACC** has Martin the/DAT
Mann   gegeben.
man   given
'I know the book, **the one that** Martin gave to the man'.
(Hist.: 'I know the book. *That one* Martin gave to the man').

   c. **Dative**:

Ich kenne den   Mann, **DEM**   hat Martin das

I   know the/ACC man, **THAT/DAT** has Martin the/ACC

Buch gegeben.

book given

'I know the man, **the one that** Martin gave the book to'.

(Hist.: 'I know the man. *That one* Martin gave the book to').

The naturalness of such recruitment is fairly transparent: Both Y-movement and REL-clause are topicalizing constructions. In other words, they share a core feature of their communicative pragmatics; and such **partial functional overlap** is commonly exploited in diachronic change. What is more, by using the case-marked demonstrative one gains a natural means of recovering the case-role of the zeroed out co-referential argument inside the REL-clause, a major theme in the syntax of REL-clauses (ch. 4).

    Later on, paratactic non-restrictive REL-clauses falling under a separate intonation contour as in (11) above were re-analyzed as restrictive REL-clauses packed under a joint intonation contour with their main clause. This re-analysis involved two minor adjustments: De-stressing the old focused – Y-moved – demonstrative pronoun, and removing the intervening pause, yielding:

(12) **Restrictive REL-clauses**:

   a. **Nominative**:

Ich kenne die Frau   **die**   hat dem   Mann

I   know the woman **that/NOM** has the/DAT man

das   Buch gegeben.

the/ACC book given

'I know the woman *who* gave the book to the man'.

(Hist.: 'I know the woman, the one who gave the book to the man').

   b. **Accusative**:

Ich kenne das Buch **das**   hat Martin dem

I   know the book **that/ACC** has Martin the/DAT

Mann gegeben.

man given

'I know the book that Martin gave to the man'.

(Hist.: 'I know the book, the one Martin gave to the man').

c. **Dative**:

Ich	kenne	den	Mann	**dem**	hat	Martin	das
I	know	the/ACC	man	**that/DAT**	has	Martin	the/ACC

Buch gegeben.
book given

'I know the man *to whom* Martin gave the book to'.
(Hist.: 'I know the man, the one Martin gave the book to').

In this case, there is nothing bizarre or unnatural about the resulting REL-clause structure. But its case-marked demonstratives received both their case marking and their pre-posed position inside the REL-clause from their precursor Y-movement construction. Their naturalness as REL-clause markers, as well as the naturalness of their syntactic position – separating main from REL-clause – is motivated by their diachronic source, not by their synchronic use in the REL-clauses.

Since Y-movement constructions are natural and universal, and since the condensation of non-restrictive REL-clauses into restrictive ones is a natural diachronic change, it is hardly surprising that many languages have adopted this general strategy for creating restrictive REL-clauses (Heine and Kuteva 2008).

6.3.4 Some unintended consequences of compressing chained clauses into serial-verb clauses

Serial-verb clauses falling under a single intonation contour are the diachronic product of a paratactic precursor – two or more chained clauses that fell under multiple intonation contours (Givón 1975a, 1991b). When a verb in one of the chained clauses grammaticalizes, often as a case-marker, the resulting serial-verb clause seems like just another, innocuous typological variant. But on occasion the compression of two or more chained clauses into a single serial-verb clause can produce bizarre syntactic consequences. We will survey three such cases below.

6.3.4.1 The *ba*-marked object construction in Mandarin Chinese

The verb *ba* or *jiang* 'grab'/'take' in Mandarin has grammaticalized as an object prefix. In the process, an erstwhile serial-verb clause, itself presumably derived from a paratactic clause-chain, has turned into an emphatic object-topicalizing – Y-movement – construction that seems to favor definite objects. Because the erstwhile verb *ba* or *jiang* in the precursor serial-verb clause

appeared before its object (VO), and because the 'take-object' clause came first in the erstwhile chained (conjoined) configuration, when the verb 'grab'/'take' grammaticalized as an object prefix, the end-product serial-verb clause now displays an OV word order. As noted in Sun and Givón (1985), Mandarin Chinese is still a rigid SVO language, at the text-frequency level of 92%–94%. The new OV construction with *ba* or *jiang* is relatively infrequent in text, as are Y-movement clauses in other languages. The range of the various object constructions with VO and OV order in current Mandarin Chinese is illustrated in (Sun and Givón 1985; tones left unmarked):

(13) a. **Pre-grammaticalized *ba* serial-verb clause (VO):**
          Zhang Xun yi **ba**   [0] duo guo-dian-wen
          Z.   X.   one **grab**   seize electric-text
          'Z. X. (in) one grab seized the telegram'
          (Hist. 'Z. X. grabbed and seized the telegram')

     b. **Indefinite object without OM (VO):**
          Liao Zhongkai cong pi-bao li   tao   chu yi-die
          L.   Z.   from leather-case inside take one-CL
             zhi-piao
             pay-ticker
          'L. Z. took a check from inside the leather-case'

     c. **Definite nominal object without OM (VO):**
          ta ning-kai   na-zhi   chang bozi bailandi
          he twist-open that-CL long neck brandy
          'he twisted open the long-necked brandy bottle'

     d. **Independent-pronoun object without OM (VO):**
          qing ta   dian xi
          ask him point play
          'He invited him to play'

     e. **Definite nominal object with OM (OV):**
          Wan Shengshi mang **jiang** dian-wen   neirong eyao de
          W. S.   quick **OM**   electric-text contents brief ADV
             shuo le   shuo
             speak ASP speak
          'W. S. immediately summarized the contents of the telegram'

     f. **Independent-pronoun object with OM (OV):**
          ni **ba** ta   da   ying le
          you **OM** him fight win ASP
          '(If) you beat him'

The condensation of two chained clauses into a single serial-verb clause, and the subsequent grammaticalization of 'grab'/'take' as an object marker, are both highly natural and widespread diachronic changes in the serial-verb languages of S.E. Asia, Papua-New Guinea and West Africa. But these two natural changes in succession have yielded a strange synchronic distortion in Mandarin, where an exceptional OV word-order applies to some definite objects but not to others, all in an otherwise-rigid VO language.

6.3.4.2 The de-verbal conjunction of Yoruba

In Yoruba, the erstwhile serial verb *si* has been grammaticalized as a conjunction. As a second verb in a clause-chain, the original verb – probably meaning 'join', 'add' or 'repeat' – carried an anaphoric pronoun, most commonly 's/he', which over time was reduced to a mere *floating low tone*. The de-verbal conjunction is now prefixed to the conjoined clause, with the floating-tone pronoun still prefixed to the conjunction, happily floating away as it would with lexical verbs. And it is still there when the subject of the conjoined clause is itself an overt pronoun. Thus (Elimelech 1973; tones omitted):[6]

(14) a. **Nominal subject in the conjoined clause**:
  Yemisi je ewa,   Baruch `-**si** je eran
  Y.   at e beans Baruch **T-C** ate meat
  'Yemisi ate beans, and Baruch ate meat'
  b. **Pronominal subject in the conjoined clause**:
  Yemise je ewa, **o** `-**si** je eran
  Y.   ate beans, **he** **T-C** ate meat
  'Yemisi ate beans, he also ate meat'

Yoruba had undergone two highly natural diachronic changes in succession: First, the reduction of an old, worn out subject-pronoun prefix into a floating tone prefixed to the verb; and second, the grammaticalization of the verb 'join'/'add'/'repeat' into a conjunction. But the synchronic end product of these two changes is somewhat bizarre, both in terms of the *post-subject* position of the conjunction, and in that the conjunction retains the erstwhile verb-prefixed pronominal floating tone.

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6. For an extensive discussion and many more examples of de-verbal conjunctions, see Heine (2014).

6.3.4.3 **Word-order in Ijo**

Ijo (Niger-Congo) is a a rigid SOV language. But currently this order applies mostly to direct objects. Most indirect objects, marked by ex-serial-verb post-positions, follow the main verb (VO), as in (Williamson 1965):

(15) a. **Benefactive (VO):**
   erí duma tuna-ni a **piri**
   he song sing-ASP her **give**
   'He sang a song for her'
   (Hist. 'He sang a song, and gave it to her')

   b. **Dative (VO):**
   erí egberi ghá-ni u **piri**
   he story tell-ASP him **give**
   'He told him a story'
   (Hist.: 'he told a story, and gave it to him')

   c. **Locative-intransitive (VO):**
   erí okí mu toru **beiin**-mi
   he swim go river **cross**-ASP
   'He swam across the river'
   (Hist.: He swam, and went, and crossed the river'

   d. **Locative-transitive (VO):**
   erí aru-bi aki tín **kaka**-mo
   he canoe-the take tree **tie**-DIR
   'He tied the canoe to a tree'
   (Hist.: 'He took the canoe and tied it to a tree')

   e. **Instrumental (OV):**
   erí ogidi **akí-ní** indi pei-mí
   he machete **take-ASP** fish cut-ASP
   'He cut the fish with the machete'
   (Hist.: 'He took the machete, and cut the fish')

   f. **Manner (OV):**
   erí aya baraki **akí** dúma tun
   he new way **take** song sing
   'He sang the song in a new way'
   (Hist. 'He took a new way, and sang the song'

The irregular synchronic word-order situation in Ijo is the result of two highly natural diachronic changes, in order:

● the condensation of chained clauses into serial-verb clauses; and
● the grammaticalization of some verbs into case-marking post-positions.

Even the resulting discrepancy between the majority of indirect objects (15a,b,c,d) that follow the main verb (VO) and the minority (15e,f) that precede it (OV) has a natural diachronic explanation: The order of chained clauses in discourse is determined by the natural order of events. When you give an object to someone (15a) you first grab it and then go and give it to the dative/benefactive recipient. This pattern, set by the high-frequency concrete verb 'give', set up the post-verbal (VO) position of the dative/benefactive in both (15a) and (15b). And likewise when you swim across a river or tie an object to something (15c,d) – the locative goal comes second in the action sequence (VO). On the other hand, when you perform an action with an instrument (15e), or metaphorically with a manner (15f), you first grab the instrument and then perform the action – thus place the instrument pre-verbally (OV).

The synchronic syntactic order of indirect objects in the otherwise-rigid SOV Ijo still reflects the natural order of the precursor – paratactic – chained clauses. Once again, an irregular, counter-iconic synchronic state is the result of successive natural diachronic changes.

6.3.5 German word-order and tense-aspect renovation

Synchronically, standard German is a VO language with flexible subject position, perhaps explained by Vennemann's (1973) TVX principle. But the old Germanic OV order has survived in subordinate clauses, as in:

(16) a. **Main clause, present (VO):**
Der   Mann isst den   Apfel
The/NOM man   eats the/ACC apple
'The man eats/is eating the apple'

b. **Main clause, past (VO):**
Der   Mann ass   den   Apfel
the/NOM man   ate   the/ACC apple
'The man ate the apple'

c. **Object REL-clause (OV):**
Der   Mann **der**   den   Apfel isst…
the/NOM man   **that/NOM** the/ACC apple eats
'The man who eats/is eating the apple…'

d. **Modal-aspectual V-complement (OV):**
Der   Mann **will**   den   Apfel essen
the/NOM man   **wants** the/ACC apple eat/INF
'The man wants to eat the apple'

    e. **Cognition-perception V-complement (OV):**
        Ich wiess **dass** der   Mann den   Apfel isst
        I   know **that** the/ACC man   the/ACC apple eats
        'I know that the man eats/is eating the apple'

    f. ADV-**clause (OV):**
        Wenn der   Mann den   Apfel isst…
        when the/NOM mann the/ACC apple eats
        'when the man eats the apple…'

The resulting mixed word-order is already a less-than-natural arrangement, presumably requiring speakers to perform burdensome on-line mental computations. But since in the spoken language main clauses are much more frequent than subordinate clauses, at a ratio of ca. 4:1 to 9:1, the functional leakage of this mixed VO-OV word-order is not too severe; even less so for children at the early age of grammar acquisition (2–3 years), when subordinate clauses are rare.

In addition, tense-aspect renovation – primarily through the grammaticalization of modal-aspectual main verbs – has increased the frequency of the OV order, since when those verbs become tense-aspect markers, as in (17) below, they drag with them the erstwhile subordinate-clause OV order into what are now re-analyzed main clauses. In the standard written language, such renovation is already well established for 'want' > *future* (17a) and 'have' > *perfect* (17b). But spoken dialects, particularly in the south, have also grammaticalized 'be' > *present-progressive* (17c), as well as replacing the preterit-past with the 'have'-marked perfect. And another form of 'be' had been grammaticalized long ago to mark the passive construction. Thus compare:

(17) a. **Grammaticalized 'want' > FUT (OV):**
        Der   Mann **wird** den   Apfel essen
        the/NOM man   **wants** the/ACC apple eat/INF
        'The man will eat the apple'

    b. **Grammaticalized 'have' > PERF > PAST (OV):**
        Der   Mann **hat** den   Apfel ge-gessen
        the/NOM man   **has** the/ACC apple PAR-eat
        'The man ate/has eaten the apple'

    c. **Grammaticalized 'be' > PROG (OV):**
        Der   Mann ist den   Apfel am essen
        the/NOM man   is the/ACC apple at   eat/INF
        'The man is eating the apple'

d. **Grammaticalized 'be' > PASS (OV):**

Der	Apfel	**wurde**	von	dem	Mann	ge-gessen
the/NOM	apple	**was**	by	the/DAT	man	PAR-eat

'The apple was eaten by the man'

With the main tense-aspects of German all now displaying OV order in the spoken dialects, word-order variability is even more acute, partly mediated by grammatical categories (subordination, tense-aspect), and partly by speech genre (informal/spoken vs. standard/written). But such a synchronic mess was engendered by a concatenation of perfectly natural diachronic changes, in order:

- word-order change from OV to VO in main clauses;
- subordinate clauses retaining the conservative OV order; and
- tense-aspect renovation through the grammaticalization of modal-aspectual main verbs.

6.3.6 The Romance and Bantu object pronouns

Both Romance and Bantu languages, with their rigid VO order, developed pre-verbal clitic object pronouns. This pre-verbal order of de-stressed anaphoric object pronouns is synchronically bizarre, especially that it apparently developed during a period of VO order. This bizarre synchronic situation may be explained by noting that current de-stressed – thus cliticized – anaphoric object pronouns arose from stressed, **emphatic independent pronouns**, most likely fronted by Y-movement. This natural two-step development may be summarized as follows:

- stressed/contrastive independent object pronouns were Y-moved before the verb (OV)
- those pronouns were later de-stressed and became clitic anaphoric pronouns.

As a result of these two natural diachronic changes, there is a sharp contrast in these languages between the position of the current emphatic/stressed independent pronouns (VO) and the position of de-stressed, verb-clitic anaphoric pronouns (OV). Thus compare:[7]

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7. Definite or pronominal post-verbal human objects in both Swahili and Spanish require the obligatory use of a pre-verbal clitic/anaphoric pronoun, a species of object pronominal agreement (Moravcsik 1974).

(18)　a.　**Swahili independent/contrastive pronouns (VO):**
　　　　ni-li-**mu**-ona　**yeye**
　　　　I-**PA**-**3s**-see　　**him/her**
　　　　'I saw *him/her*'　　　　　　　　　　　　　(⊃ not *you*)

　　　b.　**Swahili clitic anaphoric pronouns (OV):**
　　　　ni-li-**mu**-ona
　　　　I-**PA**-**3s**-see
　　　　'I saw him/her'

　　　c.　**Spanish independent/contrastive pronouns (VO):**
　　　　le-vi　　　　　　a　　**ella**
　　　　3s/DAT-saw/1s　DAT　**her**
　　　　'I saw *her* '　　　　　　　　　　　　　　(⊃ not *him*)

　　　d.　**Spanish clitic anaphoric pronoun (OV):**
　　　　le-vi　　　　　　en la　calle
　　　　3s/DAT-saw/1s　in　the　street
　　　　'I saw him/her in the street'

Both the pre-posing of stressed/contrastive independent pronouns (Y-movement) and the diachronic de-stressing of independent pronouns to yield anaphoric pronouns, as well as the automatic cliticization of the latter, are highly natural and universal (Givón 2017, chs 3, 4). Still, piling those three processes in succession, one on top of the other, has yielded a less-than-natural synchronic state.

The Y-movement construction still exists in both Swahili and Spanish, as in (19) below. The independent object pronouns that were converted into the current pre-verbal anaphoric pronouns belonged, obviously, to an older generation of independent pronouns, now replaced by a new generation:

(19)　a.　**Swahili object Y-movement:**
　　　　yeye　ni-li-ona
　　　　3s　　1s-**PA**-see
　　　　'*Him/her* I saw'　　　　　　　　　　　　(⊃ *you* I didn't)

　　　b.　**Spanish object Y-movement:**
　　　　a　　**ella**　vi
　　　　DAT　**her**　saw/1s
　　　　'*Her* I saw'　　　　　　　　　　　　　　(⊃ *him* I didn't)

6.3.7   **No. Uto-Aztecan nominalized subordinate clauses**

In many language families, such as Turkic, Altaic, Japanese, Tibeto-Burman, Cariban, Quechuan, Gorokan, Uto-Aztecan and others, all subordinate clauses are – at least historically – nominalized. The naturalness of this diachronic process is explained by the fact that the syntactic position of the two most common subordinate clause-types, V-complements and REL-clauses – or at least of their paratactic precursors – is a prototypical nominal position, either the object in the VP or headless clausal modifier in the NP, respectively (Givón 2015a, chs 25, 26).

The end product of the chain of the natural diachronic changes that lead to nominalized subordinate clauses is, alas, a less-than-natural synchronic state, where main clauses have finite syntax while subordinate clauses display nominalized non-finite syntax, often with severe limits on tense-aspect-modality and thus expressive power.[8] And the best testimony to the unnaturalness of this synchronic state of affairs is that languages with nominalized REL-clauses, V-complements and ADV-clauses sooner or later undergo the converse diachronic change – **re-finitization** (Givón 2015a, ch. 27).

Ute (Numic, No. Uto-Aztecan) presents an extreme case of this phenomenon. Nominalized clauses come in a number of types in Ute, depending on the grammatical context of nominalization. The main grammatical features of a nominalized clause in Ute are:[9]

- reduced tense-aspect-modal marking
- a nominalizer suffix on the verb
- genitive case-marking of the subject
- an object suffix on the clause (in some contexts)

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8.   This discrepancy is analogous to the word-order discrepancy seen in German, above, between main clauses (SVO) and subordinate clauses (SOV).

9.   As is the case in any category with multiple criterial-membership features, nominalization is thus a matter of *degree.* For an extensive treatment of clause nominalization in Ute and elsewhere see Givón (2001, ch. 11; 2015a, chs 25, 26, 27). The object and genitive cases in Ute, as in most No. Uto-Aztecan languages, have been almost completely merged due to an earlier cycle of VP nominalization. For the details in Ute, see Givón (2011, ch. 5; 2015a, ch. 18).

Consider the range of nominalized clauses – or nominalized VPs – in Ute (Givón 2011):

(20)   a.   **Finite main clause**:
ta'wach<u>i</u> 'u   yoghov<u>u</u>chi paqha-qa
man/s   DEF/s coyote/O   kill-PA
'The man killed the coyote'

   b.   **Nominalized clausal subject**:
ta'wach**i** 'uway   yoghov<u>u</u>chi pakha-qa-**na**
man/**GEN** DEF/**GEN** coyote/O   kill-PERF-**NOM**/s
    ka-'áy-wa-t<u>u</u>   'ura-'ay
    NEG-good-NEG-NOM be-IMM
that the man killed the coyote is not good'
(Lit.: '[The man's killing (of) the coyote] is not good')

   c.   **Complement of cognition-perception verb**:
mamach<u>i</u> 'u   puchuchugwa-qha ta'wach**i**   'uway
woman/s DEF/s know-PA   man/**GEN** DEF/**GEN**
    yoghov<u>u</u>chi pakha-qha-**na-y**
    coyote/O   kill-PA-**NOM-O**
'the woman knew that the man (had) killed the coyote'
(Lit.: 'The woman knew the man's killing (of) the coyote')

   d.   **Object REL-clause**:
yoghov<u>u</u>ch<u>i</u> 'u   ta'wach**i** 'uwáy   pakha-qha-**na**
coyote/s   DEF/s man/**GEN** DEF/**GEN** kill-PA-**NOM**/s
    ka-'áy-wa-t<u>u</u>   'ura-qha
    NEG-good-NEG-NOM be-PA
'the coyote that the man killed was no good'
(Lit.: 'The coyote [of the man's killing] was no good')

   e.   **ADV-clause**:
ta'wach**i**   'uway   yoghov<u>u</u>chi paqha-qhay-**ku**,…
man/**GEN** DEF/**GEN** coyote/O   kill-PA-**NOM**
'when the man killed the coyote,…'
(Lit.: 'Upon [the man's killing (of) the coyote],…'

Equi-subject complements of modal-aspectual verbs and switch-subject complements of manipulation verbs are also nominalized in Ute, with a nominal suffix but little T-A-M marking except for the *irrealis* suffix. But however nominalized these complements may be, the proper plural-subject agreement on the verb, with the suffix *-ka-*, must still be there. Thus:

(21) a. **Equi-subject, sg**:
ta'wachi̲ 'u   youghovʉchi paqha-**vaa-chi̲** 'ásti-kya
man/s   DEF/s coyote/o   kill-IRR-NOM   want-PA
'The man wanted to kill the coyote'

   b. **Equi-subject, pl**:
táa-ta'wachi-u 'úmʉ yoghovʉchi paqha-**qha-paa-chi̲** 'ásti-kya-qha
PL-man-PL   3p/s coyote/o   kill-PL-IRR-NOM   want-PL-PA
'The men wanted to kill the coyote'

   c. **Switch-subject, sg**:
mamachi̲ táa-ta'wachi-u 'umʉ máy-kya yoghovʉchi
woman/s PL-man-PL   3p/o tell-PA coyote/o
   paqha-**vaa-ku**
   kill-IRR-NOM

'The woman told the man to kill the coyote'

   d. **Switch-subject, pl**:
mamachi̲ táa-ta'wachi 'umʉ máy-kya yoghovʉchi
woman/s man/o   3p/o tell-PA coyote/o
   paqha-**qha-paa-ku**
   kill-PL-IRR-NOM

'The woman told the men to kill the coyote'

The diachronic recruitment of nominalization to create subordinate clauses is a natural, widespread phenomenon (Givón 2009, 2015a). But as natural and widespread as it may be, the synchronic end result is often an unholy mess, clashing with the speakers' normal – unmarked – strategy for nominal case-marking and verbal morphology in main clauses.

As noted above, languages with nominalized non-finite subordinate clauses sooner or later undergo the converse diachronic process of **re-finitization** (Givón 2012; 2015a, ch. 27). In No. Uto-Aztecan, the conservative north (Numic, Takic, Yaqui) shades into a middle strip (Tarahumara, Guarijio), south of which nominalized subordinate clauses have disappeared without a trace. Subordinate clauses in the southern languages are now just as finite as main clauses.

The middle strip of Uto-Aztecan is thus of great interest in studying the diachronic process of re-finitization. In Guarijio, one still finds the old nominal suffixes on subordinate-clause verbs, but they have been re-interpreted as part of the new finite morphology. And while the genitive marking of subjects has disappeared in nouns, it is still retained in pronouns. Thus compare (Félix-Armandáriz 2006):

(22) a. **Subject REL-clause:**
tihoé   tapaná   u'má-ka-**(a)me**
man/s yesterday run-PAR-**NOM**
'the man who ran away yesterday…'

b. **Object REL-clause, nominal subject**:
kari   amó karí-ta-ri-**a**   Huaní
house 2s/O house-build-PFV-**NOM** John/s
'the house that John built for you'
(Hist.: 'the house of John's bulding for you…')

c. **Object REL-clause, pronominal subject**:
owítiame Mochibámpo **no'ó**   tetewá-ri-**a**
woman   Mochibámpo 1s/**GEN** see-PFV-**NOM**
'the woman I saw in Mochibámpo'
(Hist.: 'the woman of my seeing in Mochibampo')

d. **ADV-clause, nominal subject**:
temé neipá asi-má   asi-**só**   Huanita
1p/s last   arrive-FUT arrive-**NOM** Juanita/s
'We will arrive after Juanita has arrived'
(Hist: 'we will arrive after Juanita's arrival')

e. **ADV-clause, pronominal subject**:
neipá yau-má-ni-a   **amó**   yau-**só**-pa
last   dance-FUT-1s-EMPH 2s/**GEN** dance-**NOM**-INCH
'I will dance after you dance'
(Hist.: 'I will dance after your dancing')

Complements of utterance verbs in Guarijio seem to have been further re-finitized, with their pronominal subject now marked as nominative. This may be due to analogical pressure from the direct-quote form. No nominalizing suffix is used there, but the participial suffix is, at least historically, a nominalizer. In contrast, the complements of 'know' and other cognition verbs still show a genitive pronominal subject and a nominal suffix on the verb. Thus compare:

(23) a. **Complement of 'say', nominative pronominal subject**:
apoé   chaní temé noka-ri-áta   wewe-**ka**
3s/s   say   1p/s move-PFV-QUOT hit-**PAR**
'He said that we hit him'
(Hist. 'He told our hitting him')

b. **Complement of 'know', nominative nominal subject**:
aapóe nané-na peniátiame wikaht-**ó** María
3s/s know-PRS pretty sing-**NOM** Maria/s
'They know that María sings pretty'
(Hist.: 'They know of María's singing pretty')

c. **Complement of 'know', genitive pronominal subject**:
nané-na-ne **amó** peniási-ka yau-**yo**
know-PRS-1s **2s/GEN** pretty-PAR dance-**NOM**
'I know that you dance pretty'
(Hist.: 'I know of your dancing pretty')

Finally, the complements of both equi-subject (modal-aspectual) and switch-subject (manipulation) verbs still retain the nominal suffix -*(a)me*, as in:

(24) a. **Equi-subject complement of modal-aspectual verb**:
simi-nare-ne ehtudiarwa-ni-**áme** kechewéka
go-DESID-1s study-PRS-**NOM** Quechehueca
'I want to study the Quechehueca language'
(Hist.: 'I want studying the Quchehueca language')

b. **Switch-subject complement of manipulation verb**:
Hustína nahkí ki-kio'ko-ri-**áme** ini-míchio kuitá
Agustina want NEG-get.sick-PFV-**NOM** be-PURP child
'Agustina wants her child to be healthy'
(Hist.: 'Agustina wants her child being healthy')

The diachronic reversion to finite structure is a natural process; it is gradual and piecemeal, progressing construction by construction and creating a variety of intermediate structures that are either more nominalized or more finite. From the perspective of ideal iconicity, ease of speech processing and ease of language learning, such a synchronic state of affairs makes grammars less transparent and, in that sense, less natural.

6.4   Discussion

6.4.1   Naturalness: Commonality vs. ease of processing

One could think of two ways of defining 'naturalness', the first one relatively simple: Just count the *frequency distribution* of forms, either cross-linguistically, cross-users, or in text. The prediction one could make here is:

(25) **Naturalness as high use frequency:**
"The more widespread a grammatical pattern is cross-linguistically, cross-speakers, or in text, the more 'natural' it must be".

The second definition is, at least in principle, *cognitive*, involving sub-criteria such as processing speed, error rate, ease of learning, degree of ambiguity, or regularity of patterns. The prediction one could make here, implicitly admitting a vague correlation with *iconicity*, is:

(26) **Naturalness as ease of cognitive processing:**
"The more irregular, ambiguous and decayed a grammatical pattern is, the harder it is for speakers to learn and process it with high speed and low error rate".

It would of course be salutary if criteria (25) and (26) somehow converged. But when in the course of the diachronic cycle of rise-and-fall constructions change their 'naturalness', it is not clear how such a happy convergence should be expressed.[10]

6.4.2 The temporal curve of the diachronic cycle

The life-cycle of grammatical constructions may be plotted as a bell-shaped curve, with three main phases:

a. At the beginning, most structural features of a recently-innovated construction are carry-overs from its diachronic source construction. This entails a great measure of ambiguity and lack of iconicity, as one construction is used to code two different – albeit related – functions. A good example of this are the conjunctions of Old Hittite, initially marking both conjoined clauses but then transferred whole-hog into the grammar of REL-clauses. During this early phase, the two usages – clause chaining and REL-clauses – resemble each other structurally, presumably resulting in ambiguity, confusion, and the need to monitor the context with greater conscious attention.
b. Over time, as a construction moves on into its mid-life range, the old structural features that make less sense in its new function are zeroed out, as in the Late Hittite REL-clause losing the now-inappropriate conjunctions. The

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10. For a later attempt to integrate the frequency and cognitive criteria for 'naturalness', see Givón (1991a, 1991b, 1991d).

trajectory of constructions during this mid-range phase is that of gradually increasing iconicity, distinctness and regularity – thus decreased ambiguity, confusion and error-rates and increased processing speed and fidelity.

c. Finally, toward the tail end of their life, grammatical constructions acquire a cumulation of irregular, counter-functional features, as local changes pile up one on top of the other. To top it all, their morphology has been gradually eroding, acquiring irregularities and eventually zeroing out. These two downward trends – the cumulation of grammatical changes and phonological erosion – conspire to make old constructions much less useful in communication. As more attractive alternatives become available, decrepit old constructions are retired, replaced by shining new ones.

6.4.3 Naturalness: Synchrony vs. diachrony

If we derive our notion of naturalness – thus universality of grammar – from purely synchronic analysis, chances are that many counter-iconic and communicatively-bizarre synchronic structures may seem perfectly natural. This is so because the inexorable cumulation of successive natural changes conspires to make crazy synchronic syntax rather widespread, thus 'natural' by our criterion (25). Heretical as this may sound, we might be better off seeking and describing naturalness – and language universals – in the rich, complex but coherent domain of diachronic change. In doing so, we may discover first the adaptive – cognitive and communicative – principles that motivate diachrony, and thus indirectly also motivate its end-product, synchrony. In this, we might lift a page from the book of theoretical biology, which long ago discovered that the fundamental principles that govern the baffling distribution of extant living forms are best discovered in the study of development, be it evolution (phylogeny) or embryology and maturation (ontogeny).[11]

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11. For an extensive overview of this issue in biology, see West-Eberhard (2004).

Abbreviation of grammatical terms

1s	1st person singular	IMM	immediate
1p	1st person plural	INCH	inchoative
2s	2nd person singular	INF	infinitive
2p	2nd person plural	IRR	irrealis
3s	3rd person singular	NEG	negative
3p	3rd person plural	NOM	nominative, nominalizer
ACC	accusative	O	object
ADV	adverbial subordinator	OM	object marker
ASP	aspect	PA	past
C	conjunction	PAR	participle
CL	classifier	PASS	passive
DAT	dative	PFV	perfective
DEF	definite	PL	plural
DEM	demonstrative	PROG	progressive
DESID	desiderative	PURP	purpose
DIR	directional	QUOT	quotative
EMPH	emphasis	S	subject
FUT	future	T	tone
GEN	genitive	V	vowel

The SOV mystery and language evolution

7.1 Introduction[1]

> It is quite senseless to raise the problem of explaining the evolution of human language from more primitive systems of communication that appear at lower levels of intellectual capacity.
>
> Noam Chomsky (1968)

> It strains credulity to pretend that language as we know it suddenly sprang up intact as a cultural invention in the absence of extensive cognitive and communicative pre-adaptation.
>
> John Lamendella (1976)

In the preceding two chapters we noted that there were good reasons for suspecting that the synchronic structure of language cannot be understood without reference to its developmental trajectory. While the discussion focused primarily on diachrony and the way it shapes the diverse grammars of individual languages, we also noted intriguing parallels between diachrony and

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1. My understanding of both language and biological evolution was rather rudimentary when the precursor to this chapter was first written in 1977. Only a decade or so later, following an exchange with the late Ernst Mayr, did I go back to reading more carefully the literature of evolutionary biology. In revising this chapter, I have tried to retain at least some of the original flavor of discovery, while weeding out the more embarrassing distortions. A more mature survey of the complexities and connectivities of language evolution, undertaken thirty years later, may be found in Givón (2009). The original footnote in 1979 ran as follows: "I am indebted to Dwight Bolinger, Harry Whitaker, Elinor Ochs and John Lamendella for many helpful comments and suggestions. Above all, I would like to register my indebtedness to Shaggy-Dog Givón (Los Angeles, CA, 1969 – Wolf Creek Pass, CO,1976), who kindled my interest in language evolution, provided many pertinent pieces of raw data, and gave me the idea of writing this chapter. *Requiescat in pace*, charmed prince".

ontogeny. In this chapter I would like to extend the discussion to the third grand developmental trend that has shaped human language, evolution.[2]

While the three developmental trends may display some striking parallels, they have shaped human language in radically different ways, in radically different contexts, and along radically different time-frames.

- **Diachrony**: Traditionally assumed to span long stretches of historical time, diachrony is in fact the concatenation of multiple instances of on-line individual communicative behavior. During each instance, speakers modify their language minutely and subconsciously. The traditionally-presumed historical time-frame of centuries or millennia is but the cumulation of multiple minute changes that take place during successive instances of inter-personal communication. The gradual accretion of such changes bears the most direct responsibility for the current synchronic state of each language, thus also for cross-language typological diversity.
- **Ontogeny**: The relevant time-frame for language ontogeny is the period of cognitive and linguistic growth and maturation of individual speakers. But the end-product, the way each mature individual communicates, must fall within the bounds of variation acceptable to the adult speech community. The effect of child language development on the synchronic structure of each language is thus limited, due to the power imbalance between adults and children, so that the adult model most often prevails in early language acquisition.
- **Evolution**: The relevant time-frame of language evolution spans the ca. 7 million years since *Homo sapiens* split from its putative primate ancestors. Subsequent hominid evolution is responsible for what is common to

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2. My much-delayed attempt to integrate the three grand developmental trends of language (Givón 2009) was inspired by further readings in evolutionary biology, in particular Fernald and White (2000), West-Eberhard (2004), and Tucker and Luu (2012). To begin with, the bio-evolutionary perspective made it possible to understand how minute local steps cumulated into 'historical' diachronic change, much like instances of adaptive individual behavior in biology. The bio-evolutionary literature thus pointed out the intimate role that development and maturation played in phylogenetic evolution. Lastly, the literature amplified the same point in neuro-cognitive evolution. All three developments were anticipated by Ernst Mayr's famous dictum about *behavior as the pace-maker of evolution*: "…evolutionary changes that result from adaptive shifts are often initiated by a change in behavior, to be followed secondarily by a change in structure… The new habit often serves as the pacemaker that sets up selection pressures that shift the mean of the curve of structural variation…" (Mayr 1976, p. 106)

all human languages – language universals. However, such universals may be best expressed as constraints on development; that is, on the possible diachronic changes that shape individual languages, and on the course of language ontogeny. How these three developmental trends interact, and the mechanisms that shape the striking parallels between them, is a foundational question whose resolution will only be hinted at here.

Chomsky's rejection of viewing human language as the product of gradual, adaptive Darwinian evolution rooted firmly in pre-human communication could have been motivated, at least in principle, by two distinct lines of reasoning:

- **Methodological**: Unlike the ample, fine-grained, graduated physical fossil record, no comparable record exists of the multiple evolutionary steps spanning the 7 million years between the communication of our chimp-like ancestors and current human language. Therefore, nothing useful, aside from idle speculation, can be said about language evolution.
- **Theoretical**: The evolution of human communication cannot be described in the familiar terms of Darwinian bio-evolution, with successive adaptations piling one on top of the other. Rather, language evolution must have been a rare exception to the rest of evolutionary biology – a gapped, instantaneous leap (Hauser *et al.* 2002).

As far as I can see, Chomsky's position is clearly the theoretical (ii). But its only discernible justification is, in fact, the lack of fossil record; that is, the methodological (i). But deriving the theoretical (ii) from the methodological (i) is a *non sequitur*. The main thrust of Chomsky's stance is, essentially, the Cartesian dualism of body and mind: In spite of the mounds of evidence suggesting that the evolution of human physical traits, including the cranium, was protracted and gradual, the evolution of human cognition and communication must have been, somehow, instantaneous and gapped.

While not as abundant as the evidence that supported Darwin's initial conjecture of gradual biological evolution driven by natural selection, the evidence for gradual language evolution is not zero either. To wit:

- Comparative evidence from the neurological, cognitive, social and communicative behavior of modern humans and their nearest primate relatives.
- Ontogenetic evidence from the neurological, cognitive, behavioral, social, and communicative development and maturation of modern human children.
- Evidence from living relics – fossils of language – such as pidginization, creolization and Broca's aphasia.
- Analogical evidence from language diachrony.

These four lines of evidence, however indirect and incomplete, may nonetheless hint at the evolutionary process. And since we have no cogent theoretical reasons to assume that language evolution was the one glaring exception to the gradual, adaptively-driven Darwinian model, the two alternatives left to us are:

- Give up on understanding language evolution.
- Use the available incomplete evidence to extrapolate plausible hypotheses that can then be evaluated and eventually tested.[3]

One line of evidence that may yet prove most productive involves the combined data-base of cognitive neuroscience, neuro-linguistics and neuro-genetics. In the past few decades, it has become increasingly possible to map genes or gene clusters onto neurological structures. It has also become possible to elucidate, in an increasingly reliable way, the evolutionary history of our genome. Lastly, it has become increasingly possible to map cognitive and linguistic functions to their supporting neurological structures. Put together, these three advances may yet make it possible to elucidate the gradual course of language evolution.[4]

Moving from the admittedly-sketchy available data to coherent testable hypotheses requires a heady mix of extrapolation, analogical reasoning and abductive inference. All three have been denounced on occasion as speculative. They are nonetheless unimpeachable gambits in the tool-kit of empirical science.[5]

7.2 The neo-recapitulationist perspective

Parallels between ontogeny and phylogeny harken back, at least implicitly, to the biological works of Aristotle, who observed a gradual progression from simple to complex in both his classificatory work – his *scala naturae* – and his embryology. A more explicit statement of how ontogeny may recapitulate phylogeny is due to Haeckel (1874), and a review of some of the issues involved may be found in Gould (1977). What is more, the more current Evo-Devo perspective on the unity of developmental trends (West-Eberhard 2004; Tucker

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3. By 'tested' one means the traditional method of sciene – derive logical consequence of the hypothesis, then subject them to falsificatory testing (see ch. 1).

4. Obviously, I couldn't have written this paragraph in the mid 1970s.

5. For a summary of the role of pragmatic inference in the overall process of empirical science see Givón (2005, ch. 8), as well as ch. 1, above.

and Luu 2012) is a clear vindication – and elaboration – of the recapitulationist perspective in biology.

As Lamendella (1976) pointed out, three features of Haeckel's original formulation have been empirically disconfirmed:

- The assumption that ontogeny recapitulates the phylogeny of adult traits; whereas the facts suggest that such recapitulation pertain to immature traits at corresponding levels of development.
- The assumption that the recapitulation is full; whereas the facts suggest that it is at best partial.
- The assumption that recapitulation is expressed at the level of the entire organism; whereas the facts suggest that it is expressed, selectively, at the level of individual organs.

Lamendella (1976) also noted how the Cartesian cleavage between body and mind still haunts our discussion of recapitulation:

> "…Most scholars have no problem accepting the notion of phylogenetic recapitulation of basic anatomical and physiological systems in the embryo, but there seems to be a general distaste for entertaining the idea that post-natal stages of human cognitive and linguistic information processing might also be a repetition of our species history…"

In the same vein, Lamendella (ms.) noted the interaction between neuro-cognitive development and maturation, on the one hand, and the evolution of culture and culturally-transmitted communication systems, on the other. Thus, protracted post-natal maturation, indeed *neoteny* – the extension of child-like traits to the adult phenotype – facilitates cultural transmission and learning:

> "…The explanation of the biological utility of immature developmental stages lies partially in the further inverse relationship between the state of maturity at birth… and the potential for a species to rise above stereo-typed, automatic responses to a limited range of specific sensory stimuli. Immaturity of neural systems that are nonetheless functional provides the developing individual with flexibility… to adapt to a highly variable environment… Maturation that is partially mediated by individual experience that directs neural growth in an appropriate direction, not only relieves the genetic code of the heavy burden of detailed specification, but also allows individual experience and learning to assume a prime role in the adaptation of both the individual and the group…." (Lamendella, ms., p. 47)

7.3 The SOV mystery

In this section we will survey a range of facts about extant human languages that, I believe, constitute a *typological relic* of an earlier stage of language evolution. In most language families known today, this relic is well attested. In the vast majority of the others, it can be easily reconstructed from internal synchronic evidence to a time-depth going back not farther than 6,000–7,000 BC. Only in a small minority of the world's languages is there no surviving internal evidence of this relic, either due to earlier departure from the putative early stage, or a faster rate of subsequent change.

The facts as I see them may be summarized as follows:

- The majority of known languages and language families exhibit SOV (subject-object-verb) syntax, and so far as one can tell have always been that way.[6] This includes major families such as Altaic, Turkic, Dravidian, Sino-Tibetan, Japanese, Cushitic, Sumerian, all Papua-New Guinea phyla, Khoi-San, Athabascan, Hokan and many others.
- The overwhelming majority of languages or language families that do not currently exhibit SOV syntax still carry clear internal evidence in their morpho-syntax that points toward a reconstructible SOV syntax at some earlier time. This group includes Indo European, Uralic, Niger-Congo, Nilo-Saharan, Afro-Asiatic, Semitic, Iroquois, Sieuxan-Cadoan, Uto-Aztecan, Mayan and probably all other Amerindian and Australian language families.
- Very few language families seem to exhibit no trace evidence of an earlier OV syntax, most of them occupying one geographic corner: Thai-Kadai, Austronesian and Austro-Asiatic.
- Most known instances of natural – non-contact-induced – word-order change, or drift, seem to suggest the drift of SOV > flexible word-order > v-first > SVO.[7] A natural, non-contact-induced drift toward SOV order is extremely rare, with most exceptions turning out to uphold the rule.[8]

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6. That is, no morphological relics in the synchronic paradigms exist to suggest otherwise.

7. See related discussion in Hyman (1975), Stockwell (1977), Vennemann (1973), Creider (1975), Foley (1976), and Givón (1977, 1983b).

8. As noted in the preceding chapter, German may be currently undergoing such a drift due to the renovation of tense-aspects. But the OV syntax of German subordinate clauses is itself a relic of earlier OV syntax. Mardirussian (1978) has also reported an apparent drift back toward SOV in Armenian.

While the evidence is not absolute, it is nigh overwhelming.[9] And the drift away from SOV syntax suggests that other word-orders, particularly (S)VO, are more suited to the current evolutionary stage of human communication, in particular more amenable to the grammaticalization of the two sub-features of topicality – referent accessibility and referent importance.[10]

As elsewhere in empirical science, it is facts that seem arbitrary, and don't cohere with the present theoretical framework, that prompt a new cycle theory building. I would like to open the discussion by posing the two questions that will guide our investigation:

- What was it in an earlier stage in the evolution of human culture, cognition and communication that prompted the first rigid word-order to grammaticalize as (S)OV?
- What were the subsequent changes in human culture, cognition and communication that motivate the drift away from OV syntax?

7.4 Extrapolation #1: Canine communication

The data reported here are the cumulation of seven years of observation of one male Belgian Shepherd dog between October 1969 and August 1976. While informal and strictly qualitative, the observation was both intensive and extensive, tracking the subject's communicative behavior with both canines and humans. Without excusing the informality of the method, its drawbacks were mitigated by the direct and near-constant personal access to the rich pragmatic context of the subject's social and communicative behavior.

The summary below highlights the most salient features of canine – indeed pre-human primate – communication. Anybody who has interacted personally with our best friends will have no trouble recognizing the description. One must still justify the choice of canines over our closer primate kin. The best justification is that, in the main, my canine data closely match the data of primate communication in the wild.

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9. M. Gell-Mann and M. Ruhlen (2011) have more recently made a similar suggestion about the earlier SOV syntax of all human language. Their cross-language documentation is more extensive than the 1979 version of this chapter. However, their generalizations concerning the directionality of word-order change from the initial SOV are not well supported, and they make no serious stab at explanation.

10. See Givón (1988, 2017).

7.4.1 Here and now, you and I, this and that visible

The most striking feature of canine communication is how firmly it is anchored in the current speech situation that is equally accessible to both speaker and hearer. The time is invariably now, the place is invariable here, and the referents are, invariably, either you and I or this and that perceptually accessible on the current scene.

(a) **Time:** Canine behavior strongly suggests ready access to long-term episodic memory of past experiences, as well as some mental representation of the immediate future. Their planning behavior hints at even longer-term representations of future action. But they never seem to communicate about objects or events in displaced time, only about those anchored in the present or the immediate future.

(b) **Place:** Dogs share our sub-cortical episodic ('long term') memory organs, the hippocampus and amygdala, and clearly have memory traces of remote objects and locations. Still, they seldom communicate spontaneously about such objects or locations, only about those present at the shared current scene. They seem, however, to understand human verbal references to salient concrete objects and persons away from the current scene.

(c) **Referents:** As noted above, dogs communicate primarily about referents present here and now. Those referents are invariably concrete entities (nouns), both animate and inanimate, or concrete activities (verbs). It is easy to teach dogs human vocabulary that codes such concrete referents, but nigh impossible to teach them abstract vocabulary, or even concrete adjectives.[11]

(d) **Animacy and agency:** Dogs seem to make a clear distinction between animate and inanimate entities, and thus presumably have some notion, however implicit, of purposive action and agency. Their observational criteria for this distinction are, most likely: "Entities that can move spontaneously without an apparent external cause must possess some internal prompt

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11. While concrete adjectives code concrete properties such as color, size or shape, they code them in isolation from their normal strong association in entities (nouns). This degree of abstraction is apparently enough to make adjectives much harder to teach to dogs; though it is apparently possible to teach them to parrots (Pepperberg 1999), Chimanzees (Rumbaugh and Washburn 2003) and Bonobos (Savage-Rumbaugh and Lewin 1993; Savage-Rumbaugh *et al.* 1993).

(intention) and the power (agency) to execute motion – just like me". There is thus no reason to assume that dogs lack the concept, however rudimentary, of cause-and-effect.

(e) **Events:** When the referent of a canine speech-act is an action/activity (event), it is invariably concrete, as are the coded verbal concepts that humans can teach them.

(f) **Speech-acts:** Canine spontaneous speech-acts are never informative (declarative, interrogative), but only manipulative (commands, requests). Nor do they seem to understand human declarative or interrogative speech-acts.

(g) **Speech-act participants:** Canine behavior suggests that they must understand the difference between speaker and hearer, both in their own communication and in their interaction with humans. In most of their spontaneous speech-acts that are directed at humans, dogs tag themselves as beneficiary and the human interlocutor as agent (you-H do this for me-C). But they clearly understand human communication that reverses the two roles (you-C do this for me-H).

(h) **Mono-propositional discourse:** While dogs' planning behavior suggests that they can mentally represent coherent multi-propositional – multi-action, multi-event – information, the coherence scope of their speech-acts is strictly mono-propositional. They have no trouble interpreting 'fetch the ball', 'sit', or 'roll over' separately, but seem baffled by the sequence 'fetch the ball, then sit, then roll over'.

7.4.2 Socio-cultural context: The Society of Intimates

As Lamendella (1976) suggested, it makes little sense to talk about a communication system outside the socio-cultural context within which it evolved, and was designed to perform its adaptive tasks. The socio-cultural context of canines communication is in most general features identical to that of non-human social primates and early hominids, as well as, within bounds, to the social context of early childhood. The context is that of the **Society of Intimates**, whose most salient characteristics are:[12]

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12. The earliest discussion of the term *Society of Intimates* occurred in the 1979 precursor to ch. 5, above. A more extensive treatment, owing much to collaboration with my late friend and colleague Phil Young, may be found in Givón (2002, ch. 9).

(a) **Small social unit**

The total group size for wild dogs is ca. 10–25 (Goodall-van Lawick and van Lawick 1971). The group-size of chimpanzees in the wild is ca. 15–40 (Goodall 1965), with the variability due to the fluid fusion-fission pattern of the social group. The comparable group size for early hominids, including modern hunters and gatherers, is 25–150 (Dunbar 1992), though Marlowe (2005) gives the median as 25.

(b) **Kin-based social organization and cooperation**

The society of wild canines and many social primates is organized around families headed by a senior female, together with her female descendants and immature male and female progeny. Social cooperation is organized along kinship lines, with the social position of adult males varying considerably from species to species.

(c) **Relatively homogeneous gene pool**

With obvious provisions for exogamy, the social unit is composed of close blood relatives.

(d) **Restricted territorial range**

The canine daily foraging range is ca. 10 km, with a median total home range 1,700 km. In comparison, chimpanzee daily foraging range is 3–5km, with median total home range of 12 km. The comparable figures for modern human hunter-gatherers is a daily foraging range of 9–14 km, with median total home range of 175km, and an average of 7 times per year of moving the home camp beyond the daily foraging range (Marlowe 2005).

(e) **Low rate of socio-cultural change**

Canine, primate and early-human societies are/were extremely time-stable, displaying little cultural change within the lifetime of an individual.

(f) **High informational stability and homogeneity**

With restricted territorial range, a small and stable social group and a low rate of cultural change, information in the canine society of intimates is highly time-stable, and is distributed homogeneously among all members of the social group (excepting the very young).

7.4.3   Information

Information may be divided into two main components:

- **Generic information** – what we all know, share and and can take for granted as members of the same cultural group; knowledge about our shared physical, social and mental universe; what cognitive psychologists call *semantic memory*.
- **Specific information** – what happens at specific times and places to specific persons, animals or and objects; what changes, what is new, what psychologists call *episodic memory*.

Given the salient features of the Society of Intimates, (a) through (e) above, generic information in such a society is time-stable, predictable and universally shared among group members. And due to the group always being (and moving) together and sharing the same here-and-now scene, the bulk of specific new information about what happened and who did what to whom is equally shared. What is then left to communicate about in the Society of Intimates? What *topics* are neither taken for granted generically nor obvious situationally? *What's news*?

There appear to be only three categories of adaptively-vital information that are neither generically nor situationally shared among group members present at the here-and-now scene:

- **Specific internal mental states**: fear, anger, arousal, pleasure, pain, hunger.
- **Specific intents to perform inter-personal acts**: aggression, submission, friendliness, courtship.
- **Urgent external states**: predator, prey, enemy.

These are precisely the most common signals communicated among group members in the canine and primate Society of Intimates.

7.4.4   A note on primate communication

The study of chimpanzees, bonobos and other primates both in the lab and in the wild has grown exponentially since the original chapter was written,[13] with important works such as de Waal (1982), de Waal and Lanting

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13. The few works I surveyed for the original version included Jay (1965), Goodall (1965), van Lawick-Goodall (1968), Schaller (1961, 1963, 1965), Sugiyama (1973), Dingwall (1979), and the overview in Lamendella (ms).

(1997), Cheney and Seyfarth (1990, 2007), Boesch (2002, 2005), Boesch and Boesch-Achermann (2000), Tomasello and Call (1997), Tomasello *et al.* (2005), Tomasello (2009), Zuberbühler (2000, 2001), Rumbaugh and Washburn (2003), Savage-Rumbaugh *et al.* (1993), Savage-Rumbaugh and Lewin (1993), among many others. There are, clearly, considerable neuro-cognitive, socio-cultural and communicative differences between social canines and social primates, evolution having not stood still. Nonetheless, within bounds, the general parameters outlined above of the socio-cultural and communicative ecology of the canine Society of Intimates match remarkably well those of social primates, both in the wild and in the lab.

7.5   Extrapolation #2: Early child language

7.5.1   Communicative mode

Much of what is known about canine and primate communication and its socio-cultural context rings familiar when one considers early childhood communication, from birth to ca. 2 years of age.[14] To summarize briefly:

(a) **Here and now, you and I, this and that visible:** Child communication between birth and ca. 2 years is overwhelmingly anchored in the here-and-now speech situation (Piaget 1952; Clark and Clark 1977; Carter 1974; Werner and Caplan 1963; Bloom 1973; Scollon 1974, 1976; Bates 1974, 1976; among many others).

(b) **Speech acts:** At the early stage of *differentiated crying*, starting ca. 2 weeks after birth, the child's speech-acts are exclusively manipulative, expressing requests for rectification of bothersome conditions such as hunger, pain, itching, discomfort and loneliness, or pleasure at their rectification (Carter 1974; Bates *et al.* 1975; Dore 1975; Bates 1978; Lamendella, ms). With the advent of first words ca. 1 yr. of age, most of the coded communication is still manipulative, with declaratives gradually phasing in and interrogatives lagging far behind (Givón 2009, chs 6, 7, 8).

(c) **Temporality:** The time-axis of child speech-acts in the first two years of life is, overwhelmingly, the present and immediate future, a fact fully predictable from the manipulative nature of the child's early speech-acts. Early declaratives

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14. For an extensive survey and update see Givón (2009, chs 6, 7, 8).

and proto-declarative, such as pointing and attention-directing gestures, are fully anchored in the here-and-now.

(d) **Spatial deixis:** Pointing at objects and persons is the earliest mode of lexical coding, conflating two distinct communicative gestures – attracting the interlocutor's attention to the child, and simultaneously to the intended object (Carter 1974).

(e) **Mono-propositional discourse:** The coherence span of the child's communicative turns during the first two years is overwhelmingly mono-propositional, expanding just before the advent of grammar (ca. 2 yrs) to conjoined clauses.

(f) **Mode of complexity:** During the early acquisition of grammar (ca. 2 years), the mode of increased utterance size and complexity is overwhelmingly that of conjunction (clause chaining). Hierarchic, subordinate clauses are phased in much later (Givón 2009, chs 6, 7, 8).

(g) **Coded lexicon:** At the early stage of lexical acquisition, ca. 1 year of age, the child's spontaneous one-word utterances, all standing for clausal information (state, event), are mostly concrete nouns. Even at age 16 months, when 20% of the utterances are longer than 1 word, only 18% of those words can be considered as 'predicates'. A sample from Bloom's (1973) corpus of a 1-yr.-old's transcripts yields the following distribution:

(1) **word-types of a 1-year-old child:**

category	N	%
object	54	30.5
location	35	19.0
adult human	9	5.0
interjection	13	7.5
"pivot"[15]	36	20.0
predicate	33	18.0
total:	180	100.0

The nouns in Bloom's transcripts are either objects of transitive clauses (O), as in (2c,d) below, or subjects of intransitive clauses (S), as in (2e), but

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15. The category "pivot" comprised one idiosyncratic word, *wid*, that Bloom (1973) declined to classify.

seldom agents of transitive clauses (A). This *absolute* distribution is highly significant, and is no doubt due to the fact that the agent is almost invariantly either the speaker or the hearer. Put another way, agents are recoverable from the situational context and thus can be safely *zero-coded*.[16] As I will suggest further below, this absolute distribution figures prominently in the evolutionary scenario.

The child's one-word utterances – indeed one-word turns – at this stage are interspersed with adult turns that interpret the child's speech-act intent (epistemic/informative vs. deontic/ manipulative) and expand and elaborate on it. Typical examples of such diadic child-adult interaction are:[17]

(2)	adult-child diadic exchanges	speech act interpretation
a.	MOT: What does the cow say Nomi?	epistemic
	NAO: Moo.	
	MOT: Moo.	
b.	MOT: Doggie.	
	NAO: Me, me.	
	MOT: I don't think you want any apple juice now.	deontic.
c.	NIN: Open	
	MOT: Okay.	deontic
	NIN: More book.	
	MOT: Okay, do you want another book?	deontic
d.	EVE: Napkin.	
	MOT: Oh, do you want a napkin too?	deontic
e.	EVE: Baby.	
	MOT: What is Eve doing?	epistemic
	EVE: Carrying baby.	

(h) Pre-grammatical pidgin communication

Just prior to the acquisition of grammar ca. 2 years of age, the child's multi-propositional communication, with each proposition now coded by 2–3 words, bears all the marks of pre-grammatical pidgin (Bowerman 1973; Ochs-Keenan 1974a, 1974b, 1975a, 1975b; Ochs-Keenan and Schieffelin 1976; Ochs-Keenan

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16. For an extensive survey of zero-coding of information, see Givón (2017).

17. For further details and data sources see Givón (2009, chs 6, 7, 8)

et al. 1979; Ochs-Keenan and Schieffelin, eds 1979; Slobin 1977; MacWhinney 1982).[18] Thus, Bowerman (1973) observes:

> "…early child speech is 'telegraphic' – that is consists of strings of contents words like nouns, verbs and adjectives, and lacks inflections, articles, conjunctions, prepositions and post-positions and, in general, all functors or 'little words' with grammatical but not referential significance…" (1973, p. 3–4)

(i) **Cross-turn spreading of utterances**

In both the early 1-word stage, when the coherence scope of the child's message is mostly mono-propositional, as well in the subsequent 2-word stage when message coherence scope turns multi-propositional, the message is typically distributed across adjacent child-adult turns, with the adult expanding and elaborating on the child's short turns (Ervin-Tripp 1970; Scollon 1974, 1976). Thus Ochs-Keenan *et al.* (1979) observe:

> "…caretaker and child together construct a single proposition. We suggest that a child may learn how to articulate [full] propositions through such a mechanism. That is, she may learn how to encode [full] propositions by participating in a sequence [of adjacent turns] in which she contributes components of a proposition…" (1979, pp. 267–268; bracketed material added)

7.5.2 **Socio-cultural context**

The socio-cultural ecology of L1 acquisition during the child's first 1–2 years, whether in the confines of the nuclear family, the extended family or the extended clan at the home site of the hunters-gatherers (Marlowe, 2005, 2010; Hrdy 2009), resembles in all major respects the Society of Intimates of canines and social primates described above (Section 7.4.2). With the added caveat that a vast power and knowledge asymmetry exists between the child and adult care-givers – older siblings/cousins, familiar adult kins – in the early years. This asymmetry dissipates gradually over time.

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18. See extensive update in Givón (2009, chs 6, 7, 8).

7.6   Pre-grammatical pidgin as an evolutionary stage

As noted earlier (ch. 5), human language can be processed in two radically different modes, the pre-grammatical (pidgin) mode, and the syntactic (grammatical) mode, with the major differences between them recapitulated as:

(3) | **pre-grammatical processing** | **syntactic/grammaticalized processing** |
|---|---|
| a. topic-comment constructions | subject-predicate constructions |
| b. loose clause-chaining (simple clauses) | tight hierarchic subordination (complex clauses) |
| c. separate intonation contour over simple clauses | unified intonation contours over complex clauses |
| d. flexible-pragmatic word order | rigid-grammatical word order |
| e. nearer to 1:1 noun-to-verb ratio in text | higher noun-to-verb ratio in text |
| f. no grammatical morphology | rich grammatical morphology |
| g. slower, attended processing | faster, automated processing |
| h. higher error rate | lower error rate |

Again, as noted earlier, the diachronic process of grammaticalization, via which grammatical morphology and syntactic constructions arise in tandem, involves construction-by-construction changes in which pre-grammatical paratactic structures change to grammatical-syntactic structures. During the first two years of language development, the child's communication is overwhelmingly pre-grammatical, and earlier on mostly mono-propositional. Only toward the third year of their life do children begin to acquire grammar.

Pre-grammatical Pidgin communication is not devoid of regularities, but rather displays a number of universal, transparently iconic 'rules'. Most of those are later integrated into grammatical communication. The most salient rules of pre-grammar are:[19]

(4) **Rules of pre-grammatical communication**
   i. **Intonation rules:**
      a. **Stress and predictability:**
         "Information chunks that are less predictable are stressed".

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19. This formulation of the regularities of pre-grammatical Pidgin communication comes from a later date (Givón 1988; 1989, Chapter 3; 1995, ch. 9).

   b. **Melodic contours and mutual relevance:**
"Information chunks that belong together conceptually are packaged together under unified intonation contours".

   c. **Rhythm and pauses:**
"The size of the temporal break between information chunks corresponds to the size of the cognitive or thematic distance between them".

  ii. **Proximity rules:**

   a. **Proximity and relevance:**
"Information chunks that belong together conceptually are kept in closer spatio-temporal proximity".

   b. **Proximity and scope:**
"Grammatical functors ('operators') are placed closest to the chunks of lexical or propositional information ('operands') to which they are most relevant".

  iii. **Linearity rules:**

   a. **Linear order and importance:**
"More important information chunks are fronted".

   b. **Linear order and unpredictability:**
"More unpredictable ('new') chunks of important information are fronted".

  iv. **Quantity rules:**

   a. **Zero coding and predictability:**
"Predictable or already-activated information is left unexpressed".

   b. **Zero coding and relevance:**
"Unimportant or irrelevant information is left unexpressed".

The acquisition of grammar by children is gradual and proceeds through intensive interaction with adult interlocutors, who contribute active feedback, interpretation, expansion and correction. What is eventually acquired is, by and large, the adult grammatical model. Children do engage in their own spontaneous grammaticalization, producing constructions that are not attested in the adult input (Bowerman 1973). But such spontaneous innovations are most often rejected by the adult interlocutors, and are eventually weeded out of the child's language, given the overwhelming power imbalance between child and adult.

Natural second-language acquisition by adults seldom proceeds beyond the pre-grammar pidgin stage. This is also, in all essential detail, the language of Broca's aphasia. As an illustration, consider (Menn 1990, p. 165):

(5) …I had stroke… blood pressure… low pressure… period… Ah… pass out… Uh… Rosa and I, and… friends… of mine… uh… uh… shore… uh drink, talk, pass out…

…Hahnemann Hospital… uh, uh I… uh uh wife, Rosa… uh… take… uh… love… ladies… uh Ocean uh Hospital and transfer Hahnemann Hospital ambulance… uh… half'n hour… uh… uh it's… uh… motion, motion… uh… bad… patient… I uh… flat on the back… um… it's… uh… shaved, shaved… nurse, shaved me… uh… shaved me, nurse… [sigh]… wheel chair… uh..

Given the multiple contexts in which pre-grammatical Pidgin is the preferred mode of multi-propositional communication, I see no alternative but to assume that in language evolution as well, the first stage of multi-propositional discourse was a pre-grammatical pidgin.[20]

7.7   The evolution of grammar: A hypothesis

7.7.1   Ground-zero: Shift of the communicative context

It is utterly senseless to discuss the evolution of human language without considering first the changes in the adaptive context that prompted it. As noted earlier, the Society-of-Intimates context in which primate communication was embedded motivated the following constraints on pre-human and early-human speech-acts:

- mono-propositional coherence scope
- strictly manipulative speech-acts
- anchoring in the here-and-now
- largely un-coded lexicon
- strong context dependence

The socio-cultural context of pre-human communication also guaranteed the extreme time-stability and intra-group sharing of **generic-cultural** knowledge. Likewise, the here-and-now anchoring of communication guarantees the intra-group sharing of **specific-situational** knowledge.

The change we must contemplate now is one that shifted, however gradually, both categories of **shared knowledge**, so that both the cultural-generic

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20. The same general trend was also suggested by Bickerton (1981). See overview in Givón (2009, chs 9, 10, 12).

and situational-specific knowledge ceased to be universally shared within the social group. This change must have made **declarative information** an adaptive necessity. I would like to suggest that the rudiments of this change are well-documented in the evolutionary history of early humans – *homo habilis* and especially *Homo erectus*. It involved:[21]

- an expanded foraging range for both big-game scavenging and hunting by males as well as gathering by females;
- splitting into smaller foraging parties;
- the establishment of a stable, well-defended home base where both the too-old and the too-young could be left safely during the day.
- moving the home-base periodically over the yearly cycle.[22]

This new cultural-geographic pattern created an **information imbalance** within the social group, in terms of both the generic and specific contexts. Complex generic knowledge gleaned by the small scavenging, hunting and gathering parties was no longer automatically available to the whole group. New hunting, gathering, tool-making and fighting skills became specialized and required teaching. Likewise, the specific situation-based context was not shared any more by the entire group. Adaptively-crucial new information was now vested in scattered individuals and small sub-groups. So that adaptively-urgent new specific information was not available to all group members in the shared here-and-now.

7.7.2   Changes in the communication system

7.7.2.1 Noun coding: From deixis to well-coded nouns

Given the previously-evolved referential device of pointing (deixis) for establishing **joint attention** to a referent, the first step of coded communication must have been, as it is still in child language, the lexicalization of referent nouns. Since the range of adaptively-relevant well-coded objects and situations must have been, to begin with, fairly restricted, the verb – action, state,

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21. In revising this section, especially regarding the contextual shift that prompted the rise of human communication, I benefitted from access to the more recent literature of evolutionary anthropology, too vast to acknowledge all here; most specifically Klein (1989/1999), Marlowe (2005, 2010), Hrdy (2009), and Bickerton (2005).

22. Marlowe (2005) suggests that such a move, prompted by exhausting the carrying capacity of the local habitat, occurs on the average 7 times a year.

event – could have been easily inferred by a simple cultural calculus: What else does one do with game animals? With food items? With shelter? With a tool? With a hungry child? With a conspecific of the opposite sex? With a predator? With an enemy? In the hunter-gatherer Society of Intimates, the answers – the verbs – are universally obvious. And as in early child communication, the lexicalized noun must have initially been the same *absolutive* array – either the object of a transitive event (O) or the subject of an intransitive event (S).

7.7.2.2 Verb coding: From one-word to two-word clauses

When increased cultural and environmental complexity made the calculus of inferring the verb less tenable, lexicalized verbs were added to the one-word utterance, much like in the two-word stage of early childhood communication (Bowerman 1973). Since at the beginning the verbs were still fairly predictable from the context, they were added as *afterthought* (R-dislocation) following the more entrenched lexicalized noun. That is, in the paratactic structures:

(6) **Early paratactic two-word clauses:**
   • transitive: o,v (deer, kill)
   • intransitive: s,v (deer, run)

Eventually, the separate intonation contours of these early paratactic clauses were merged, yielding the corresponding syntactic clauses under joint intonation contours; respectively:

(7) **Early syntactic two-word clauses:**
   • transitive: ov (deer kill = 'kill the deer')
   • intransitive: sv (deer run = 'the deer runs')

7.7.2.3 From mono-propositional to multi-propositional discourse

With the gradual accretion of adaptively-vital information that was not universally shared among group members, the move from mono-propositional to multi-propositional discourse became inevitable. As noted earlier, behavioral evidence suggests that both canines and non-human primates have mental representations of coherent multi-event sequences in their *episodic memory*. The cognitive pre-adaptation for multi-propositional discourse had thus been already in place. Multi-propositional discourse depends on multi-even coherence; that is, on the fact that adjacent events in a sequence are relevant to each other, as in hunting sequences, bulb-foraging routines, tool-making routines, mating sequences, food-preparation routines or raiding sequences.

The most concrete element of cross-event coherence is **referential coherence** – the recurrence of an important topical referent over successive events (see ch. 2). In human communication, this element is most commonly the agent (A) of transitive events or the subject (S) of intransitive events. The most natural pre-grammatical pidgin device for coding recurrent referents is **zero anaphora**.[23] The most common device for coding unpredictable new referents is ʟ-**dislocation** – fronting of the new topic. Both have been listed in (4) above as part of the 'rules' of pre-grammatical communication. The pre-grammatical pidgin that must have emerged as the early mode of multi-propositional discourse must have, therefore, had the following clause types:

(8) a. **Transitive:**
     • new topical agent: ᴀ, ᴏᴠ
     • recurrent topical agent: [0] ᴏᴠ
  b. **Intransitive:**
     • new topical subject: s,ᴠ
     • recurrent topical subject: [0] ᴠ

7.7.2.4 Grammaticalization as an evolutionary process

There is no reason to believe that the evolution of grammatical communication from pre-grammatical pidgin did *not* follow the sequence seen in diachrony and child-language acquisition, leading to the gradual emergence of:

● tight, hierarchic syntactic construction out of loose paratactic clause-chains;
● grammatical morphology out of lexical words.

But the early SOV word-order of human language predates this stage, having been already established during the earlier phase of mono-propositional pidgin communication (see (6), (7) above). It was then carried over to multi-propositional pidgin communication, then onward to grammaticalized-syntacticized language.

The early SOV order of human language is thus an **evolutionary relic** of homo sapiens' early mono-propositional pidgin communication. Its adaptive rationale was rooted in single-event cognition, rather than in multi-event discourse coherence.

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23. For detail, see ch. 2, above, as well as Givón (2017).

7.7.2.5 **The drift away from SOV**

As noted at the outset, SOV is still the most common rigid word-order in human language. Wherever it has changed, the natural drift seems to be:

(9) **Natural drift in word-order change:**
SOV > pragmatically-controlled flexible word-order > v-first > SVO

The adaptive impetus for this drift does not reside in **single-event cognition**, but rather in **multi-event discourse coherence**. The dead-giveaway is that the earliest stage of drift – from SOV to pragmatically-controlled flexible word-order – involved three discourse-pragmatic 'rules', two of which commonly conflate into the same communicative devise (Givón 1988; see (4) above):[24]

(10) **Discourse-pragmatic word-order devices:**
    a. pre-posing unpredictable new information   (ʟ-dislocation)
    b. pre-posing important information   (ʟ-dislocation)
    c. post-posing more predictable old information (ʀ-dislocation)

Given that most recurrent/predictable nominal referents are zero-coded (see (8) above, as well as ch. 2), the **pre-verbal subject** position (SV) in the evolved grammaticalized SOV order is the direct consequence of the discourse-pragmatic word-order device (10a,b), thus motivated by the adaptive demands of **multi-propositional discourse**. The **pre-verbal object** position (OV), on the other hand, was the product of the earlier evolutionary phase of **mono-propositional discourse**, and motivated there by the prior lexicalization of nouns before verbs (see (6), (7) above).

7.8 **Discussion**

7.8.1 **Vestigial relicts of early communicative modes**

As noted earlier, our capacity for pre-grammatical communication remains an enduring feature of the human linguistic tool-kit, as is evident from its ready availability in early child language, adult 2nd-language pidgin, and

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24. The bulk of grammar, both morphology and syntactic constructions, has relatively little to do with event cognition, and most to do with cross-event coherence in discourse, be it narrative or conversation. For an extensive construction-by-construction account, see Givón (2001). A more theoretical overview may be found in Givón (2005).

Broca's aphasia. A broadly similar communicative genre is telegraphic speech (Janda 1976). In bio-evolutionary and neurological terms, this is testimony to the relatively recent evolution of grammatical communication.

In the same vein, the rules of pre-grammatical communication (4) have been incorporated whole hog into extant grammars.[25] One may thus consider the use of zero-coding of referents that are either highly accessible in the anaphoric context or unimportant (passive agent, antipassive patient; see Givón 2017, as well as ch. 2, above) as another surviving relic of pidgin communication. In the same vein, universal intonation and word-order devices such as contrastive stress, clause-level intonation contours, L-dislocation and R-dislocation may also be considered such relics.

7.8.2   Recapitulation and developmental trends

What is meant by 'recapitulation' has changed considerably over the notion's protracted history. The foundations were laid down by Aristotle's work in biology, involving first the recognition that biological structure is functionally motivated (*De Partibus Animalium*). Aristotle's bio-classification was presented then as a graduated *scala naturae* of increased size, complexity and 'perfection' (*Historiae Animalium*). And his study of embryo development (*De Generationem Animalium*) implicitly recapitulated the graduated *scala naturae*.

The late 18th and early19th Centuries added the explicit notion of phylogenetic evolution (Lamarck 1809), to which Darwin affixed the adaptive motivation – natural selection. Haeckel's (1874) observed parallelism, couched in the metaphor "ontogeny *recapitulates* phylogeny", was an explicit integration of Aristotle's disparate observations into the Darwinian paradigm. With proper delimitation of scope and context, recapitulation survived into the expanded theoretical agenda of modern evolutionary biology (Gould 1977).

The modern integration of the third developmental trend, on-line individual adaptive behavior and life-time learning, owes much of its original impetus to Lemarck's (1809) idea of inheritance of acquired traits. Having been first debunked by Darwin (1859), it was eventually fleshed out into a credible mechanism, beginning with Baldwin (1896) and Waddington (1942, 1953), and on to Mayr (1976), Fernald and White (2000), West-Eberhard (2004) and Tucker and Luu (2010), among many others. This slow expansion of the recapitulationist agenda allows us to view individual on-line adaptive behavior as the key *shared*

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25. See Givón (1989, ch. 3).

mechanism of ontogeny and phylogeny; and then to view language diachrony as the concatenation of multiple instances of on-line individual communicative behavior – thus the linguistic equivalent of individual adaptive behavior. In sum, then:

(11) **The three developmental trends:**

trend	biology	language
phylogeny:	bio-evolution	language evolution
ontogeny:	embryology, maturation	language acquisition
adaptive behavior:	on-line adaptive behavior	language diachrony

The time-scale of diachrony was traditionally assumed to be the uniquely-human scale of cultural history – decades, centuries, millennia. This view was foisted upon us by the traditional method of *comparative reconstruction*, a method that imposed on language diachrony the misleading perspective of large, gapped temporal spans. Such a perspective was articulated uncritically by both Saussure and Bloomfield. But in fact, diachronic change is the concatenation of successive instances of on-line individual adaptive behavior. And realizing this affords us a clearer view of the profound unity of the three developmental trends of human language, not only in terms of analogy, but also in terms of homology; that is, shared mechanisms (West-Eberhard 2004).

Abbreviation of grammatical terms

A   agent
L   left
O   object
R   right
S   subject
V   verb

CHAPTER 8

Language and ontology

8.1   Introduction: How real is reality?[1,2]

> The world is all that is the case.
>
> L. Wittgenstein, *Tractatus* (p. 5)
>
> The limits of my language means the limits of my world.
>
> L. Wittgenstein, *Tractatus* (p. 115)

It is a sad tribute to the conceptual poverty of a scientific discipline, even a would-be one, that a practitioner feels bound to apologize, abjectly, every time s/he takes an inferential-abductive leap and comes up with ideas whose inductive or deductive provenance is less than 100-percent secure. In writing the old version of the preceding chapters ca. 40 years ago, especially when I was about to make an adventuresome guess, I found myself impelled to propitiate the wrathful Gods of Science for real and imaginary infractions. For the force of habit, even more so of bad habits, is alas nigh irresistible. I would like therefore

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1. This chapter remains, despite the intervening years, the most speculative in the entire book, as well as the most fun to write and re-write. The original version recorded my indebtedness to Martin Tweedale, Tora Kay Bikson, Haj Ross, Derek Bickerton, Pete Becker, Dwight Bolinger and Joe Goguen for many helpful comments and suggestions. More than ever, they remain absolved of the wild conjectures and flights of fancy that have been allowed into the manuscript; especially that some of them – T. K. Bikson, Pete Becker, Dwight Bolinger – are no longer with us and cannot protest. The revised chapter benefitted enormously from comments from Mike Posner and Esa Itkonen. Needless to say, they too are absolved of any responsibility for the way I chose to interpret their generous advice.

2. The term 'ontology' as used throughout this chapter harkens back to an ancient Greek verbal root *ont-* that, when a separate word, appears mostly as a nominalized-participial form *ont-on* 'being', 'having been' but never as the infinitive **ont-ein* 'to be' or a finite verb. By extension, ontology may also suggest 'coming into being'.

to open this concluding chapter by exorcizing bad scientific habits, and cannot imagine a better way of doing that than to offer the following observation, made clearer to me after better acquaintance with the work of pragmatist philosophers of science (Peirce 1931, 1934, 1940, 1955; Hanson 1958; see ch. 1). May it be chanted daily like a mantra:

(1) "While observed facts, facts deduced from facts, and logical consequences deduced from theories are the flesh and bones of scientific inquiry, its heart and soul are, still, abductive speculation about where the facts might fit, and why they are the way they are".[3]

The tentative nature of abductive reasoning is of course well known, e.g. Anttila (1977):

(2) "…Abduction is always a gamble, whereas deduction, with little risk and low return, never introduces anything new…" (1977, p. 14)

A logician worthy of his tool-kit should be able to acknowledge first the limits of deduction, as Wittgenstein did in his *Tractatus*, noting that a deductive system, taken by itself, is a flawed instrument for gaining new knowledge, seeing as how all its propositions can be reduced to either tautologies or contradictions. In the same vein, induction in and of itself does not advance us much farther beyond the facts – or at best more general summaries of the facts – toward understanding and explanation.

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3. This is not to deny the useful role of deduction in the process of scientific inquiry. As Karl Popper noted in his seminal *The Logic of Scientific Discovery* (1934/1959), deduction plays an important role in testing hypotheses, by first deducing their logical consequences and subjecting those to empirical, oft inductive, testing. If such testing shows the logical consequences of the hypothesis to be factually true, one can then apply deductive reasoning and conclude that there was a *failure to falsify*, so the hypothesis lives to see another day (and more testing). If the empirical tests indicate that the logical consequences of the hypothesis are not true, the hypothesis is then judged falsified by reasoning through *modus tolens*. That is (see ch. 1, above; also Itkonen 2005):

a. Hypothesis H $\supset$ consequences C1, C2, C3
b. C1, C2, C3 are not true $\supset$ Hypothesis H is not true

All this is not to deny, either, the usefulness of deduction in closed axiomatic systems such as logic or mathematics. But then, those systems do not pertain to empirical issues.

In a lecture at UCLA sometime in the late 1970s, the speaker offered as part of his conclusion the following observation:[4]

(3) "…the structure of our linguistic description of events reflects the structure of the events themselves…"

This somewhat tautological statement was made during a discussion of Wittgenstein's (1953) grand thesis of *meaning as use*. In his discussion of meaning in 'ordinary language' (as against logic), Wittgenstein used the analogy of tools. Their 'meanings', he noted, cannot be simply discerned from their observable attributes – color, shape, size, length etc. Rather, one needs to know their **use** in order to understand what they 'mean'. By analogy, to understand the meaning of words we must know the **context** in which they are used:

(4) "…Think of the tools in a tool box: there is a hammer, pliers, a saw, a screw-driver, a ruler, a glue-pot, glue, nails and screws. – The functions of words are as diverse as the functions of these objects… "*All* tools serve to modify something". Thus the hammer modifies the position of the nail, the saw shapes the board, and so on…" (1953, pp. 6–7)

Whether inadvertently or not,[5] Wittgenstein borrowed a familiar Classical theme, reaching all the way back to Aristotle – that body parts are very much like tools, so that by knowing their observable physical attributes we know little of what they 'mean'. Only by considering their purpose or use can we understand their 'meaning', thus also understand why they are made the way they are. Put other way, their physical design is **adaptively motivated**:

(5) "…if a piece of wood is to be split with an axe, the axe must of necessity be hard; and, if hard, it must of necessity be made of bronze or iron. Now exactly in the same way the body, which like the axe is an *instrument* – for both the body as a whole and its several parts individually have definite operations for which they are made; just in the same way, I say, the body if it is to do its *work* [= function], must of necessity be of such and such character…" (*De Partibus Animalium*, p. 650; italics and bracketted material added)

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4. Robert van Valin, "Remarks on meaning, language and culture", lecture given to the Anthropology Dept., UCLA, Febr. 27, 1978.

5. Wittgenstein was notoriously indifferent to antecedence, as this explicit disavowal in the *Tractatus* suggests: "…the reason I give no sources is that it is a matter of indifference to me whether the thoughts that I have had have been anticipated by someone else…" (1918, p. 3).

But what in the name of Tarnation could our lecturer have meant in (1)? A pictorial isomorphism between the description and the object being described? In the 1980s, this theme became a major preoccupation under the rubric of **iconicity**, stimulated by the work of C. S. Peirce and precipitating a frontal attack against Saussure's arbitrariness doctrine (Haiman 1985; ed. 1985; see ch. 1). But even the pioneering semiologist Peirce could not help but notice the limits of linguistic iconicity – the fact that language represents not only concrete easy-to-picture objects but also abstract notions and functions with no clear iconic representation. Peirce thus noted that the linguistic sign is a mixed bag, in which more motivated, natural-looking icons (*physis*) are intermixed with more symbolic, arbitrary conventional rules (*nomos*):[6]

(6) "…Particularly deserving of notice are icons in which the likeness is aided by conventional rules…" (1940, p. 105)

More to the point, scientific descriptions – or the facts they purport to represent – are hardly 'objective'. More often than not, they are contaminated by the theoretical **perspective** of the perceiver-describer. Or, as the Peircean philosopher R. N. Hanson (1958) noted, facts are **tainted by theory**. They are only meaningful within the bounds of a particular theory. This is, indeed, in line with Kant's synthesis of the **pragmatic middle ground** between the two reductionist extremes in epistemology, Aristotelian empiricism and Platonic rationalism. To quote Kemp's interpretation of Kant on the less-than-objective nature of sensory input, thus of solid facts:

(7) "…We do not find them already organized… but rather organize them ourselves… the order and regularity in the appearance, which we entitle *nature*, we introduce ourselves. We could never find them in appearance, had not we ourselves, by the nature of our mind, originally set them there…" (1968, p. 23)

Suppose you were my guest in pre-Columbian Southwest Colorado; and suppose I took you on a walk up the sun-drenched southern slopes of the San Juan mountains; and suppose we both saw in the distance, at the very same time, a man walking up a parched low hill, saw him sitting down on a pile of rocks, then raising his arms, face uplifted, eyes shut, then holding that posture for a long time. And suppose then a third party materialized on the spot and

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6. See extensive discussion in Givón (1989, ch. 3).

asked: "What is that man doing?" To which you might have responded: "He is mourning his dead mother"; while I, disagreeing (as I am often prone to do), said: "I think he is praying to the Great Spirit".

And suppose it then transpired, just for the lark of it, by a fluke or a stretch, that I was right and you were wrong. But, being deferential to the man's evident grief-or-prayer, we both refrained from asking *him*. And suppose that the savvy third party who asked the question, having heard our conflicting answers, then said: "You two have no disagreement about the *event itself*, only about its *interpretation*. See, the observable facts – the man walking up the hill, his sitting on the pile of rocks, his raised arms and uplifted face, his staying in that uncomfortable posture for a long spell – are not in dispute, for they are all necessary parts of *either* event, mourning or prayer. Given more context, you might resolve your interpretive conundrum. But the 'objective' event is still an integral part of *both* interpretations".[7]

Our conundrum is, of course, the assumption that 'reflect' in (3) above is the traditional empiricist relation between two entities that exist independently of each other; as Aristotle (apparently following Epicure) stated in the opening paragraph of *De Interpretatione*:

(8)   "…Now spoken sounds [=words] are symbols of affections of the soul [=thoughts], and written marks are symbols of spoken sounds. And just as written marks are not the same for all men [=are language specific], neither are spoken sounds. But what these are in the first place signs of – affections of the soul – are the same for all men [=are universal]; and what these affections are likenesses of – actual things – are also the same for all men…" (*De Interpretation*, p. 25)

As it turns out, both mature non-reductionist philosophy of science and cognitive neuro-science concede the constructionist, interpretive, theory-laden nature of facts, as well as the somewhat circular, multi-layered relation between fact and theory; so that what is fact vis-a-vis the current ('upward') cycle of theory-building is already a theoretical construct vis-a-vis the preceding

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7.   Esa Itkonen (i.p.c.) has reminded me that Wittgenstein (1953) had a somewhat similar invented example, used for the very same purpose: "…Imagine a picture representing a boxer in a particular stand. Now this picture can be used to tell someone how he should stand, should hold himself; or how he should not hold himself; or how a particular man did stand in such and such place; and so on…" (1953, p. 11).

('downward') cycle.[8] Thus, while Kant conceded that there might be, somewhere deep down the layered hierarchy of repeated facts-to-theory progression, *the world as it is of itself* (*die Welt an sich*), he also noted that it was unlikely we would ever know it. What we know will remain – alas, if one is bothered by the indeterminacy – *the world as it is to us* (*die Welt für Uns*).

8.2   Intermezzo I: Nature vs. artifice

What Aristotle also suggested, in the very same paragraph (8) that launched his epistemological empiricism, was that the semiotic relation between sounds and meaning was *arbitrary* (non-universal; 'not the same for all men'); whereas the reflection relation between objects and their mental representation was *natural* (universal; 'the same for all men').

The preoccupation with what comes from nature (*physis*) vs. what is the artifice product of convention (*nomos*) permeated all three main branches of Classical Greek philosophy – physics, epistemology and ethics. Aristotle, for example, opted for an arbitrary, conventional view of physics (divine Creation), language and ethics, but for naturalness in his discussion of both our mental representation of objects (8) and biological design (5).

Epicure, on the other hand, considered physics, mental representation, ethics, *and* the semiotic relation equally natural. Predating Aristotle in his empiricism, Epicure asserted that our mental constructs are derived from sensory data. Both Epicure's naturalism in physics and his empiricism in epistemology can be seen in:

(9)   "…To begin with, nothing comes into being out of what is non-existent. For in that case anything would have arisen out of anything, standing as it would in no need of its proper source… The whole of being consists of bodies and space. For the existence of bodies is everywhere attested by sense itself, and it is upon sensation that reason must rely when it attempts to **infer the known from the unknown**. And if that which disappeared had been destroyed and become non-existent, everything

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8.   I owe my late colleague Jake Beck (i.p.c.) the story of the 'upward' progression of visual analysis of colors, whereby in the retina and mid-brain's optic tectum extremely abstract computations are performed that do not correspond one-on-one to the 'perceived' colors of the rainbow. The latter, what we eventually think we see, only emerge through repeated re-analysis in the cortical visual areasV1-V2-V3-V4 in the ventral trend of the occipital lobe (Bartels and Zeki 2000; Roe *et al.* 2012).

would have perished, that into which the things were dissolved being non-existent…" (Diogenes Laertius, *Lives of the Eminent Philosophers*, vol. II. X, p. 569; boldfacing added)

And again, in rejecting the creationist account of nature:

(10) "…the atoms move with equal speed… some of them rebound to a considerable distance [and when collide, rebound]… each atom is separated from the rest by void, which is incapable of offering any resistance to the rebound; while it is the solidity of the atom which makes it rebound after a collision… Of all this there is no beginning, since both atoms and void exist from everlasting… Moreover, there is an infinite number of worlds, some like this world, other unlike it." (*ibid*., p. 575; boldfacing added)

Epicure's insistence on naturalness is also extended to language, where, much like Aristotle, the linguistic argument is integrated into his empiricist epistemology:

(11) "…Hence even the names of things were not originally due to convention [*ex arkhes = nomos*], but to the nature [*physis*] of the men of each tribe [, who,] under the impulse of specific feelings or specific sensory perceptions[,] uttered specific cries. The air thus emitted was moulded by their individual feelings or sensory perceptions, and differently according to the specific regions which the tribes inhabited…" (*ibid*., p. 605; bracketed material added)

Lastly, Epicure extended his naturalist perspective to his pleasure-based human ethics:

(12) "…Wherefore we call pleasure the alpha and omega of a blessed life. Pleasure is our first and kindred good. It is the starting point of every choice and of every aversion, and to it we come back, inasmuch as we make feeling the rule by which to judge every good thing. And since pleasure is our first and native good…" (*ibid*., p. 655)

In Aristotle's treatment of human morality, the basic question is laid out as follows:

(13) "…For this reason also the question is asked, whether happiness is to be acquired by learning or habituation or some sort of training, or comes by virtue of some divine providence or again by chance…" (*Nicomachean Ethics*, p. 1737)

And likewise:

(14) "…Now some think that we are made good by nature, others by habit-
      uation, others by teaching. Nature's part evidently does not depend on
      us, but as a result of some divine cause is present in those who are truly
      fortunate; but argument and teaching, we may suspect, are not powerful
      with all men…" (*ibid.*, p. 1864)

Aristotle moves on to assert that what is natural and universal in human
behavior is our striving for pleasure and happiness – a la Epicure; but that only
in people with 'superior refinement' or 'active disposition' does this natural
inclination transform into more admirable ethical values, such as honor, which
is 'the end of political life':

(15) "…most men, and men of the most vulgar type, seem (not without some
      reason) to identify the good, or happiness, with pleasure; which is the
      reason why they love the life of enjoyment… But people of superior
      refinement and active disposition identify happiness with honour; for
      this is, roughly speaking, the end of political life…" (*ibid.*, p. 1731)

What is more, morality is anchored in people's natural sociality, again an
Epicurian theme:

(16) "…now by self-sufficient we do not mean that which is sufficient for a
      man by himself, for one who lives a solitary life, but also for parents,
      children, wife, and in general his friends and fellow citizens, since man
      is sociable by nature…" (*ibid.*, p. 1734)

Plato was the most conspicuous exponent of epistemological rationalism,
holding that our knowledge of the external word is determined by **innate ideas**
already in our mind, where an idealized mental 'form' (*eidon*) corresponds to
every messy, variable external object. Here is how Socrates explains the logic
of this doctrine in the *Meno* dialogue:

(17) "…Thus the soul, since it is immortal and has been born many times,
      and has seen all things both here and in the other world, has learned
      everything that is. So we need not be surprised if it can recall the knowl-
      edge by virtue of everything else which, as we can see, it once pos-
      sessed…" (*The Collected Dialogues of Plato*; Hamilton and Cairns, eds
      1961; *Meno*, p. 364)

To some extent, this idealization is also reflected in Plato's discussion of the
naturalness of the sound-meaning correspondences in language – provided

one could decide who speaks for the real Plato. In *Cratylus*, for example, Hermogenes first cites Cratylus as tending toward an Epicurian – naturalist – view of language:

(18) "…I should explain to you, Socrates, that our friend Cratylus has been arguing about names. He says that they are natural and not conventional – not a portion of the human voice which men agree to use – but that there is a truth or correctness in them, which is the same for Helens as for Barbarians…" (*ibid.*, *Cratylus*, p. 383)

He then volunteers that he himself holds Aristotle's position of arbitrariness:

(19) "…I have often talked over this matter, both with Cratylus and others, and cannot convince myself that there is any principle of correctness in names[,] other than convention and agreement…" (*ibid.*, *Cratylus*, p. 383)

Socrates then opts for Cratylus' Epicurean-naturalist position:

(20) "…And Cratylus is right in saying that things have names by nature, and that not every man is an artificer of names, but he only looks to the name which each thing by nature has, and is able to express the true forms [*eida*] of things in letters and syllables…" (*ibid.*, *Cratylus*, p. 429)

He then proceeds to support his argument with a veritable tour-de-force of hilarious fake etymologies of complex Greek words.[9]

The seeming ambiguity about Plato's own thinking persists in the discussion of naturalness vs. arbitrariness of human morality. Thus, in the *Republic* Socrates seems to argue for the naturalness of 'just' (*dikos*), suggesting that whoever applies justice only to cases of harming a friend but not to harming an enemy is wrong, violating the universality and natural justice:

(21) "…If, then, anyone affirms that it is just to render each his due, and he means by this that injury and harm is what is due to his enemies from the just man and benefits to his friends, he was no truly wise man who said it. For what he meant was not true. For it has been made clear to us that in no case is it just to harm anyone…" (*ibid.*, *Republic* I, p. 585)

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9. Socrates' etymological slights of hand in the *Cratylus* dialogue inspired several generations of Neo-Platonic Hellenistic grammarians in Alexandria to develop a more empirical account of the morphologically-complex Greek verbal paradigms (Itkonen 2010).

In the *Laws*, however, Clinias argues for the non-naturalness of morality and the naturalness of war:

(22) "…Humanity is in a condition of public war of every man against every man, and private war of each man with himself…" (*ibid.*, *Laws* I, p. 1228)

But further on in the *Laws*, Athenian seems to argue for natural morality:

(23) "…There is nothing, then, of all a man owns so natively alive as the soul to shun evil but follow on the trail of the chief good…" (*ibid.*, *Laws* V, p. 1315)

Still, the very same Athenian then switches position, arguing that only selfishness is truly natural:

(24) "…But of all the faults of the soul the gravest is one which is inborn in most men, one which all excuse themselves and none therefore attempts to avoid – that is conveyed in the maxim that 'everyone is naturally his own friend', and that it is only right and proper that he should be so, whereas, in truth, this same violent attachment to self is the constant source of all manner of misdeed in every one of us…" (*ibid.*, *Laws* V, p. 1318)

Whether in their physics, epistemology or ethics, the Classical philosophers remained preoccupied with what was natural and universal, as against what was the artifact of habituation, convention and law – and thus arbitrary and non-universal. This preoccupation remains a major matrix of Western social thoughts all the way to the Enlightenment, where the two poles of the debate were fixed for seeming eternity:

"Man is naturally peaceable and timorous, at the slightest danger his first movement is to flee; he becomes warlike only by dint of habit and experience".   J.-J. Rousseau, *The State of War*

"During the time men lived without a common power to keep them all in awe, they are in that condition which is called war; and such a war as is of every man against every man".   T. Hobbes, *Leviathan*

8.3   On construing a universe: Space, time and being

There is a wealth of evidence from natural language to suggest that the semantic features by which we classify the universe of nouns (entities) are arranged in a familiar implicational hierarchy. At the very top of the hierarchy one finds the most generic classificatory features of 'abstract', 'temporal' and 'concrete'. These three are translatable into, respectively, 'exist', 'exist in time' and 'exist in space'. The progression along this scale is of decreased abstraction, yielding the implicational hierarchy:

(25)   exist in space ⊃ exist in time ⊃ exist (but not vice versa)

This implicational hierarchy suggests that what exists in space must also exist in time, and what exists in time must also exist, but not vice versa. That is, if a 'a chair' exists in space, it also exists in time, thus also exists. An event or state such as 'their victory', 'the celebration' or 'Yesterday' exists in time and thus exists. And abstract notions such as 'serendipity', 'love' or 'freedom' exist, but neither in time nor in space.

The implicational-hierarchic relation of the three most-general attributes of nominal entities can be also represented as a *ven diagram* of successive inclusion:

(26)
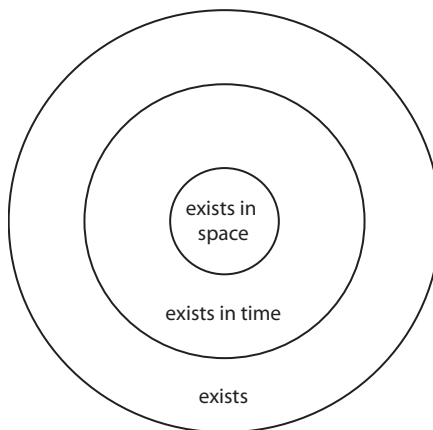
Several facts about natural language suggest that the implicational hierarchy (25) of degree of concreteness is cognitively real. First, there is the well-known property of **selectional restrictions**, a fancy jargon for 'the kind of predications that must be true of a nominal entity'. A number of non-temporal, non-spacial predications, such as similarity, identity or lack thereof may qualify all nominal entities. Thus, for example:

(27) a. This chair/event/idea is **the same** as that one.
      b. This chair/event/idea is **different**.
      c. This chair/event/idea is **similar**.

In the same vein:

(28) a. This woman/event/idea is **important**.
      b. We **talked about** that woman/event/idea.
      c. I **don't like** this woman/event/idea.

It is of course true that a number of predications are specific to temporal entities, the middle of our hierarchic scale, but are incompatible with either abstract or concrete nouns, and thus behave non-hierarchically:

(29) a. The celebration **happened/took place** last week.
      b. *The chair/idea **happened/took place** last week.

However, another group of predications are compatible with both concrete and temporal nouns but not with abstract nouns, thus upholding the hierarchy:

(30) a. The field **begins** here and **ends** there.
      b. The celebration **began** on Friday and **ended** on Tuesday.
      c. *My idea of freedom **begins** at 8:00am and **ends** sometime after noon.

Some normally abstract notions can, of course, undergo a **figurative semantic shift** and acquire a temporal sense, as in:

(31) a. Chaos **began** right at 8:00pm when they closed the bar.
      b. Noam's abstract ideas **began to interfere** with his sleep.

But as predicted by the hierarchy, many predications – 'be behind the barn', 'break'/'be broken', 'bend'/'be bent', 'touch'/'be touched', 'appear on the scene', 'eat'/'be eaten', etc. – can only qualify concrete nouns, and thus uphold the top of the hierarchy.

A second set of language facts that suggest the existence of the implicational hierarchy (25)/(26) involve the diachronic process of **semantic bleaching**, via which spatial concepts develop temporal senses but never vice versa; and likewise temporal concepts develop abstract senses of 'existence' or 'identity' but seldom vice versa. Consider, for example, the abstract verb 'be' in any language. Historical evidence suggests that such a verb always arises from semantic bleaching of some more concrete spatial-locative verb such as 'sit', 'stand', 'lie', 'stay' or 'sleep'. Thus, for example, the historically younger Spanish copula *estar*, etymologically related to our more concrete verbs 'stand' and 'stay', still

maintains both its concrete locative sense and its temporal sense, but never the most abstract sense of 'existence'. Thus:[10]

(32) a. **Spatial:** está en la casa 's/he is in the house'
      b. **Temporal:** esta celebrando 's/he is celebrating'
      c. **Abstract:** *está un hombre '*he is a man'

But the older copula *ser* can only be used in the more abstract sense:

(33) a. **Spatial:** *es en la casa '*s/he is in the house'
      b. **Temporal:** *es celebrando '*s/he is celebrating'
      c. **Abstract:** es un hombre 'he is a man'
      d. **Abstract:** es guapa 'she's pretty'

A similar historical process of semantic bleaching from concrete-spatial to temporal to abstract may be seen in the widespread development of articles – from *spatial-deictic* demonstratives ('this', 'that') to the *discourse-deictic* – thus temporal – articles ('a', 'the'). Thus consider:

(34) a. **Spatial deixis:** Give me *that* fork, willya?
      b. **Discourse/temporal** *That* was all I heard. Now *this* is what
          deixis: I think…
      c. **Definite article:** Well, *that* man came over last night and…
      d. **Indefinite article:** I met *this* woman yesterday and…

In the same vein, almost universally, locative deictics such as 'there' and other spatial expressions develop into temporal deictic expressions such as 'then', but not vice versa (Traugott 1975).

Lastly, in the grammaticalization of verbs into tense-aspect markers, concrete verbs of spatial location, motion or possession are bleached into various temporal operators, most commonly:[11]

(35) a. sit/stand/lie/stay > progressive aspect
      b. go > future tense/modal
      c. come/arrive/have > perfect > perfective/past

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10. See Wright and Givón (1987); Givón (2015a, ch. 12), as well as ch. 2, above. Likewise, the verb *-laala/-leele* 'sleep', 'lie down' in Bemba has become the progressive aspect marker *-laa-/-lee-*. A more classical example is one of the verbs 'be' in Classical Greek, *men-ein* that is still used as the locative 'stay' but is also grammaticalized as a verb suffix with either a progressive or passive-auxiliary use.

11. See Givón (1973d); Traugott (1975); Heine and Kuteva (2002, 2007), *inter alia*.

8.4 Tao and the un-construed universe

Suppose, given the presumed randomness of the pre-cognized universe (Kant's *die Welt an sich*), undifferentiated and not yet organized by conscious-ness, we were to launch into the massive perceptual-cognitive-evolutionary task of construing the universe, gradually bringing order into the primordial chaos. Here the accounts of various mystical traditions may or may not be helpful, but are nonetheless instructive. For example, the Old Testament assigns an initial state of chaos to the just-created universe:

(36) be-re'shit   bara'   'elohim
     in-beginning create/PERF/3sm God
         'et-ha-shamayin   ve-'et-ha-'aretz;
         ACC-the-heaven(s) and-ACC-the earth

'In the beginning God created the heaven(s) and the earth;

ve-ha-'aretz   hayta   tohu   va-vohu   ve-ħoshekh
and-the-earth be/PERF/3sf confusion and-chaos and-darkness
         ʕal   pney   ha-t'om
         over face/of the-precipice

and the earth was confusion and chaos and darkness over the preci-pice…' (Gen. 1:1–2)

After which, the first step God takes is to introduce the first binary distinction, differentiating the original darkness into light and dark:

(37) va-yo-'mar   'elohim: "yɨ-hi'   'or";
     and-3sm-say/PRET God   3sm-be/JUSS light
         va-yɨehi'   'or;
         and-3sm/be/PRET light

and God said: "Let there be light!"; and there was light;

va-ya-r'   'elohim 'et-ha-'or   ki-ţov,
and-3sm-see/PRET God   ACC-the-light SUB-good
and God saw the light (and) that it was good,
         va-ya-vdel   'elohim beyn   ha-'or
         and-3sm-divide/PRET God   between the-light
             u-veyn   ha-ħoshekh…
             and-between the-dark

and God divided between the light and the dark…' (Gen. 1:3–5)

Two preliminary ontological axioms must be now considered, the first one a version of Descartes' *cogito ergo sum*, re-cast as the axiom of *self-existence of the cognizer* (or, for that matter, of the Creator):[12]

(38) **Cartesian axiom of existence of the cognizer:**
"If someone construes, cognizes or creates a universe, that someone must perforce exist".

The second, Kantian axiom, pertains to the existence of the construed universe:

(39) **Kantian axiom of existence of the construed external world:**
"If a universe is construed or cognized by someone, then it must perforce exist".

Axioms (38), (39) are the ontological foundations of all inquiry, perception and cognition. They are, in principle, not deduced from any prior knowledge, but are *pre-conditions* to all knowledge.

Another ontological axiom that is taken for granted by the post-Socratic epistemological tradition is that not only are the cognizer and the object of cognition distinct, but, most crucially, the former has *no direct access* to the latter:

(40) **Post-Socratic axiom of no direct access to knowledge of the external world:**
"The mind has no direct/innate access to knowledge of the world".

While not logically derived of axioms (38), (39), the separation axiom (40) has been a cornerstone presupposition of post-Socratic Western epistemology. Most mystical traditions, on the other hand, take it for granted that the separation decreed by (40) is not necessary, so that knowledge can be arrived at directly and without the laborious procedures decreed by either evolution or Western epistemology. The mystics thus envision the **fundamental unity** of mind and world, thus **direct access** to knowledge – leastwise by the enlightened.

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12. Descartes' *cogito* is an instance of the general presupposition associated with the grammatical subject of verbal clauses (see Keenan 1976a, as well as ch. 2, above).

As an example, consider Lao Tse's opening description, in the *Tao Teh Ching*, of the pre-construed universe of *Tao*:[13]

(41)   The Tao that can be told is not the real Tao,
       Names that can be given are not real names,
       Nameless is the Father of heaven and earth,
       Named is the Mother of all things. (TTC, sutra 1)

The mystic has set up here the fundamental distinction between the featureless, dimensionless pre-cognized universe of *Tao* ('the Father') and the cognitively-organized universe of distinctions and features or names ('the Mother'). The pre-dimensional, pre-cognized *Tao* is further described as:

(42)   Tao is an empty bowl,
       Forever drawn from
       It remains full, fathomless,
       The fount of all things.
       In it sharp edges are blunted,
       Tangled knots untied,
       Bright lights are tempered,
       Turmoils submerged.
       It remains a dark deep pool,
       Its source unknown,
       Father of all things,
       Prelude to Eternity. (TTC, sutra 4)

Unlike the Biblical account, the Taoist perspective on Creation is much closer to Western cosmology prior to the advent of the Big Bang theory, thus also to Epicure's non-creationist physics – that the universe had no beginning, but has always existed in some form or another. However, unlike Epicure's objectivist perspective, Lao Tse declines to further specify the primordial pre-cognized universe of Tao. Distinctions and features are not objectively there, but rather are introduced by the cognizing mind – a true Kantian perspective.[14]

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13. From my own translation of the *Tao The Ching*, traditionally attributed to Lao Tse (ca. 6th Century BC).

14. Esa Itkonen (i.p.c.) notes that another mystical tradition, Hinduism, recognizes the *Brahman* as the early, pre-cognized state of the universe, akin to *Tao* (Itkonen 1991).

Probably the most compelling (if metaphoric) account of the relation between the pre-differentiated universe of *Tao* and the distinction-bound cognized post-*Tao* universe is given as follows:[15]

> (43) Thirteen spoken unite at the hub,
> But the wheel hinges on an empty hole.
> You mold clay into a cup,
> But the space within is what is filled.
> Walls and a roof make a house,
> But the empty inside is where you live.
> Thus, while the visibles have their purpose,
> It is the invisible that is most real. (TTC, sutra 11)

Given axioms (38), (39) and (40) above, and having thus presupposed the existence of both the universe and the cognizing mind, we are still bereft of the actual means for construing distinct entities within the brand-new universe. For the universe we start with is the chaotic Biblical *tohu va-vohu,* or Lao Tse's undifferentiated *Tao*. What such a primordial universe still lacks are some criterial properties or **dimensions** by which the cognizing mind can differentiate individual entities. We may take it for granted that the most generic features of the cognized post-*Tao* universe, the ones that must emerge first, are existence, time, and space. But while the latter two have some discernible beef on the hoof, what is the ontological status of abstract existence?

8.5   Intermezzo II: Sense, reference and 'The World'

8.5.1   Sense vs. reference

If we were to construct – or construe – a universe, it is safe to assume that Kant was probably right about the presumed existence of some objective world – *die Welt an sich* – independent of our perception or cognition. He was probably equally right, however, in adopting the caution that all we really deal with in our perception, cognition and language is the subjective *die Welt für uns.*

Adherents of the extreme objectivist research programme that eventually, in the late 1920s, came to be called **Logical Positivism** – beginning with Frege

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15. In Taoist cosmology-cum-epistemology, the *Tao* is both the pre-dimensional source of all that is but also the parallel 'deep' reality of the dimensioned universe of cognized, usable objects. The latter, however useful in everyday life, is said to be an illusion, akin to the Buddhist *Samsara.*

(1884, 1892, 1893), then Russell (1905b, 1908, 1956), then Carnap (1956, 1959, 1963) – may have convinced themselves that the domain of reference of human language is some objective Real World (RW) defined in strict logical terms.[16] But ample evidence from language and cognition suggests that the Kantian *Welt an sich* is largely irrelevant to the way language organizes our cognitive representation of the **relevant universe**, and the way we deploy grammar to communicate about it.

In their discussion of the meaning of nominal expressions, the logical positivists re-introduced Aristotle's[17] distinction of **sense** vs. **reference** (a.k.a. intention vs. extension; a.k.a. connotation vs. denotation; respectively). Put plainly, our experience of entities in our world is double-edged: We may construe them first as existing, referring entities, located at some point on our time-space grid. But that tells us relatively little about what **type** of entities they are. In order for our experience of referring entities to be **meaningful**, we must construe them as members of particular types, classes, or kinds. They need to have some **experiential properties**, evoke a description. Consider:

(44) a. **The horse** ran away.
      b. **A horse** is a riding animal.
      c. This is **the horse** I rode home.
      d. This is **a horse**.
      e. This one is **big/black/slick/fast**.

In (44a,c), 'the horse' or 'this horse' is used as a referring expression. In (44b,d), 'a horse' is used as a non-referring **description**, or as referring to the **type** 'horse' rather than to a **token** of that type. The use of the adjectival predicate in (44e) is in a way akin to the non-referring nominal predicate in (44d), furnishing us with a description of the type (44b) or of a token (44e).

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16. As Frege himself conceded (1893, Appendix II), *Russell's Paradox* (Russell 1908) made the formal objectivist program questionable, introducing in set-theory terms ("The set of all sets that don't include themselves, does it or does it not include itself?") the problem of perspective, or context, the pragmatic bogeyman that keeps bedeviling all logic-bounded approaches to language and cognition (see discussion in Givón (2005, ch. 1).

17. In *De Sophisticis Elenchis*, where a referring nominal expression is Aristotle's *sensus divisus*, and a non-referring or generic one is *sensus compositus*.

8.5.2   The domain of reference: The Real World vs. the Universe of Discourse

The treatment of reference in linguistics is a historical by-product of the Logical Positivist tradition of Frege, Russell and Carnap. In that tradition, the range of propositional modalities was restricted to *true* and *false*, with the choice having to do with how propositions mapped onto the so-called **Real World** (RW). Propositions that mapped onto states or events in the RW were said to be true. Those that contradicted states or events in the RW were said to be false. And those that coded states or events unattested in the RW but not contradictory to any were said to be *possible*, or 'lacking truth value'.

In parallel, reference ('denotation') was held to be a mapping between referring nominal expressions in language and entities that *existed* in the RW (Russell 1905, Carnap 1959; Strawson 1950; *inter alia*). Truth value of propositions containing nominal expressions depended, at least in part, on whether those nominal expressions did or did not have denotation in the RW.

As an illustration of this approach, consider the propositions in (45) and (46) below:

(45)   a.   *The present king of France* is bald.
      b.   *The present queen of England* is bald.

(46)   a.   There is a king of France (and only one).
      b.   There is no one that is both king of France and bald.
      c.   There is a queen of England (and only one).
      d.   There is someone that is both queen of England and bald.

According to the logic-bound approach to reference, in asserting (45a) one asserts two contradictory propositions – the false (46a), and the true (46b). And further, the falsity of (46a) is due to **failed denotation**. In asserting (45b), on the other hand, one is not being contradictory. Rather, one asserts two propositions, one involving a **successful denotation** (46c), the other that just happens to be factually false (46d).[18]

It is of course remarkable that human languages code the entities in (45a) and (45b) with exactly the same grammatical device – a definite NP – paying no heed to their denotation in the RW, or to the truth value of the propositions

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18. Esa Itkonen (i.p.c.) points out that the later analysis of such example by Strawson (1950) suggests that no contradiction is derived here. Since the issue is complex and technical, I have elected not to delve into it further here.

in which they are embedded. Likewise, human languages ignore RW-anchored denotation and truth-value in marking indefinite NPs:

(47) a. She came over yesterday riding **a unicorn**.
    b. She came over yesterday riding **a horse**.

The inescapable conclusion is that the grammar of human languages, and the mind behind it, march to a different drum than the logician's in matters of reference. In human language, it seems, reference – denotation – is not a mapping from linguistic expressions to individuals existing in the RW. Rather, it is a mapping from linguistic expressions to individuals established verbally in the **Universe of Discourse**.

It is of course true that the Universe of Discourse and the proverbial RW enjoy considerable overlap in normal human communication, which often deals with extant humans and their everyday affairs. But when the two worlds part company, the grammar of reference cheerfully disregards denotation in the RW, opting instead for denotation in the Universe of Discourse.

Indeed, the grammar of reference can, and on occasion does, disregard denotation altogether. Thus compare:

(48) a. She's looking for **a horse**; **it** escaped last Friday.
    b. She's looking for **a horse**; and **it** had better be white.

'A horse' in (48a) denotes an entity in the **universe of discourse**. 'A horse' in (48b) does not. But the grammar of English applies the referring anaphoric pronoun *it* to both, the RW horse that escaped last Friday (48a) and the imagined white horse yet to be encountered (48b).

8.5.3 Referential intent

It is of course possible for a logic-based approach to reference to make each possible Universe of Discourse a separate realm of denotation for referring linguistic expressions. The **Possible Worlds Semantics** of the 1960s-1970s (Kripke 1963, 1972; Cocchiarella 1965; Hintikka 1967; Purtill 1968; Scott 1970; Montague 1970; Lewis 1972; *inter alia*) was a formal attempt to do just that. It remains to be seen, however, whether the proliferation of *indexing* under this approach accomplishes much more than the mere re-branding of major islands of pragmatics that still remain impervious to truth-conditional logic.[19]

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19. The title of Montague's (1970) paper "Pragmatics and intentional logic" is a tacit concession to the inherently pragmatic nature of the *Possible Worlds* programme.

In one clear sense, reference in the Universe of Discourse is already a pragmatic enterprise, in that it reaches outside the bounds of the atomic proposition. Every Universe of Discourse is opened up – established – by a particular **speaker** who then **intends** entities in that universe to either refer or not refer. And it is this **referential intent** of the speaker that seems to be more relevant to the grammar of reference in human language. Thus, a nominal expression 'horse' in (44) or (48) above is *of itself* devoid of reference, having only a lexical-semantic **sense**. It is their use in particular propositional contexts that allows us to utter (48a) and (48b) with two distinct intents in mind, one referring to an extant 'horse' in the current Universe of Discourse (48a), the other referring only to the *type* 'horse' but not to any actual individual (48b). And it is the speaker's referential intent that determines which of these two interpretations will hold.

Contrast now (48) above with (49) below:

(49) a. She will be riding **a new horse** tomorrow, **the one** she just bought.
      b. She will be riding **a new horse** tomorrow, if she can find **one**.

The referring 'horse' in (49a) pertains to the current universe of discourse. The non-referring 'horse' in (49b) pertains to some future universe – a 'possible world'. The grammar of natural language, however, seems to be sensitive in *both* cases to their denotation in some universe of discourse.

We owe Quine (1953) the original observation that in human language there is a strong interaction between reference properties of nominals and the **propositional modalities** under which they are embedded. As an illustration, consider the reference properties of the indefinite nominals in (50) below:[20]

(50) a. **Realis modal scope**: She rode a unicorn.
        (i)   **Referring**: ⊃ There was a specific unicorn there, and she rode it.
        *(ii) **Non-referring**: *⊃ There was no unicorn there, but she rode it.
      b. **Irrealis modal scope**: She will ride a unicorn.
        (i)   **Referring**: ⊃ There is a specific unicorn, that she'll ride.
        (ii) **Non-referring**: ⊃ She'll ride some unicorn, as of yet unspecified.
      c. **Negative modal scope**: She didn't ride a unicorn.
        *(i) **Referring**: *⊃ There was a specific unicorn, but she didn't ride it.
        (ii) **Non-referring**: ⊃ She didn't ride *any* specific member of the type 'unicorn'.

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20. See also Givón (1973b; 2001, ch. 10).

Lastly, we noted earlier (chs 2, 3) that the grammar of some languages distinguishes between referring and non-referring nominals under the scope of *irrealis* modalities, where English marks more explicitly definiteness. Thus recall (Bemba; Givón 1973a, 1973b):

(51) a. **Referring**:
          n-ka-mona   **umu**-ana
          1s-FUT-want REF-child
          'I will see a/the child'   (⊃ I have a specific child in mind)
      b. **Non-referring**:
          n-ka-mona   **mu**-ana
          1s-FUT-want REF-child
          'I will see a child'   (⊃ I have no specific child in mind)

The distinction between the referring child in (51a) and the non-referring one in (51b) has nothing to do with the RW, since the future is just a 'possible world'. Rather, it has to do with the **Universe of Discourse** as construed in the speaker's mind and verbally established, and in which nominals can be **intended** to either refer or not refer.

8.6   The lexicalization of mundane experience[21]

8.6.1   Preamble

We return now to our self-assigned task of constructing – or construing – a universe chock-full of differentiated entities, unlike the pre-differentiated *ur*-universe of *Tao* or *tohu wa-vohu*. We have, recall, agreed to take two axiomatic presuppositions for granted:

● That we, the Cartesian observers, do exist (38); and
● That the Kantian universe also exists, independently of our cognition (39).

Now, if one were to start from scratch construing a universe full of well-differentiated entities, what are its primitive dimensions – above and beyond existence, time and space? And is there a particular order by which one may proceed introducing those dimensions? Put another way, if our task were to let distinct, individuated entities emerge out of the primordial pre-cognized chaos, what should be our first step? Perhaps the way human languages organized their vocabulary, thus their construed experience of the universe, might give us some hints.

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21. For the original discussion, see Givón (2001, ch. 2).

One of the silliest nit-picking exercises that linguists love to engage in is the perennial typological quibble about '*my* language lacks lexical classes', or 'this/that language doesn't have this/that lexical class'. When the argument is subjected to even the most cursory analysis, it boils down to **lack of word-class morphology**, be it inflectional or derivational. But grammaticalized morphology is only one of the three main criteria for word-class membership, and the least reliable of the three, though to linguists the most visible. These criteria are:

- morphology
- syntactic distribution
- semantic clustering

The reason why morphology is the least reliable criterion for word-class membership has to do with the morphological cycle of grammaticalization: Morphemes rise and fall over their historical lifetime, so that one could catch a particular morphology in a particular language at any phase of its rise-and-fall cycle, from the most distinct and regular to the most decrepit and bizarre.[22]

Syntactic criteria are infinitely more reliable and universal, and may be given in terms of the syntactic slots that are typically occupied by members of a particular word-class.

(52) a. **Prototypical nominal slots: Clausal subject and object; head of the NP**

The kind woman   gave   the book   to the child
———————————   —————   —————————
      SUBJ.   DIR. OBJ.   IND. OBJ

b. **Prototypical adjectival slots: Modifier in the NP; copular predicate**

That   little   dog (is) feisty
         ———   ———
         ADJ   ADJ

(53) **Prototypical verb slot: Head of the VP**
   a. The horse **galloped**
   b. The man **went** to the store
   c. The woman **mounted** the horse
   d. The girl **sent** her brother to school
   e. The woman **wanted** to leave
   f. They **made** him quit
   g. The child **knew** that her mother was there

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22. See chs. 5, 6, above as well as extensive discussion in Givón (1971; 2015a, chs 1, 2, 3), Heine and Kuteva (2009).

While these syntactic distributional criteria are not absolute, they are reliable statistically to the level of 90–95% in text. That is, if you quantify the distribution of any of the three main word-classes in natural text, they would occupy their prototypical syntactic slots 90–95% of the time.

Semantic criteria for word-class membership are also extremely reliable, provided one keeps in mind the difference between prototypical vs. less-prototypical members (say, 'dog' vs. 'serendipity', 'big' vs. 'stupendous', or 'walk' vs. 'contemplate', respectively), as well as the difference between prototype vs. non-prototype discourse genres (face-to-face everyday communication vs. written academic text, respectively). And as in the case of our syntactic criteria, the frequency of prototypical nouns, verbs or adjectives in natural everyday communication behaving like prototypical members of their class far exceeds the frequency of semantic or syntactic deviants.

With these cautions in mind, members of the three main lexical word-classes can be set apart semantically by a cluster of four major criterial features. These features may be considered the most *generic* semantic features of our conceptual lexicon, and are at the top of the hierarchy of semantic features by which humans classify their mundane experience. To wit:

- temporal stability (rate of change over time)
- complexity (number of clustered features)
- concreteness (physicality, spatiality)
- spatial compactness (degree of spatial concentration or scatter)

While analytically distinct, these features exhibit strong associations, so that in many instances the presence of one turns out to be predictable from the presence of another. Nevertheless, the feature of **temporal stability** is in a sense *primus inter pares*, giving coherence to the experiential cluster as a whole.

Nouns, verbs and adjectives may be placed on the scale of temporal stability of coherently-bundled experience. By 'coherently-bundled' we mean either **spatial contiguity** or **temporal simultaneity** or both.

In recognizing the primacy of time and space in the categorization of experience we merely recapitulate Immanuel Kant, who in his *Critique of Pure Reason* singled out time and space as the most primordial features of experience. Indeed, he considered them *synthetic apriori* – factual but *presupposed*; or, in more modern parlance, *wired in* and thus prerequisites to all other features of experience:

(54)   "…the representation of space must be presupposed. The representation of space cannot, therefore, be empirically obtained from the relations of outer appearance. On the contrary, this outer experience is itself possible at all only through that representation…" (*Critique of Pure Reason*; in Smith 1929, p. 68)

8.6.2   **Nouns**

● **Temporal stability**

Prototype members of the class *noun* occupy the most time-stable end of the scale. That is, the properties of prototypical nouns change only little over our repeated perceptual scans, thus over experienced time. If it is a *chair* now, it is likely to still be a *chair* in five minutes, an hour, or a day – in size, shape, color, texture, consistency or usage. Of course, a fine gradation still exists within the class, so that a *child* may change faster than a *tree*, and that faster than a *house*, and that faster than a *rock*, etc.

● **Complexity**

One important reason for the great temporal stability of nouns is that they are **bundles of many co-experienced features**. And as all natural categories, they exhibit strong **feature-association**. For example, the noun *horse* has prototypical size, shape, color, weight, sound, smell, part-whole composition, behavioral propensities, cultural uses, etc. Consequently, when either rapid change or deviance crop up in one feature, the relative stability of the rest insures that a less prototypical individual remains within a reasonable range (say, one standard deviation) of the population's prototype (mean, norm). A miniature horse is still a horse; as is a pink horse, or a three-legged horse, or a horse that has been trained to moo like a cow or walk upright, or a horse that refuses to be ridden.

● **Concreteness**

The time-stability of prototype nouns also owes much to the fact that they are concrete and made out of relatively-durable materials. Their bundled – co-experienced – properties, such as size, color, shape or consistency, thus change only slowly as individual features as well.

● **Compactness and individuation**

The fact that prototype noun entities tend to be spatially compact rather than scattered all over the perceptual map is just another way of saying that they exhibit **spatial coherence**. That is, the sub-parts of a prototype noun entity tend to occupy contiguous space. So that while scattered nouns do exist ('celebration', 'Tuesday', 'rain'), they tend to be non-prototypical in other ways too – *abstract*, *mass*, or *less durable*.

● **Countability and individuation**

One important consequence of prototype noun intities being compact is that they also tend to be relatively small, thus **figures** occupying a relatively small portion of the much-vaster perceptual field – the **ground**. This is how they stand out vis-a-vis the ground. Several noun entities may thus occupy a portion of the ground, with the consequence that prototype nouns ('dog', 'tree', 'rock') tend to be **individuated** or **countable**, as against non-prototypical *mass* nouns ('rain', 'love', 'water', 'sand', 'freedom').

8.6.3 Verbs

● **Temporal instability**

Prototype verbs occupy the other end of the time-stability scale as compared to nouns. They are coherent bundles of experience of relatively **short duration**. They code rapid changes in either the state, condition or location of some subject or object noun entity, as in e.g. 'shoot', 'kick', 'break', 'jump', 'leave', 'drop', etc.

As elsewhere, a healthy range of variation exists in this category too, so that some verbs are less prototypical, and may code events of longer duration ('work', 'read', 'depreciate', 'cool off', etc.). Other verbs, less prototypical yet, may code longer-enduring *states* ('dream', 'sleep', 'sit', 'love', 'know', 'want', 'regret', 'mourn', etc).

● **Temporal compactness**

While the prototype noun entity is spatially compact but temporally durable, the prototype verb is just the opposite – temporally compact but spatially more diffuse. The temporal compactness of verbs is just another way of acknowledging their low temporal instability.

● **Concreteness**

The experiential phenomena bundled as prototype verbs are most typically **events** that involve **concrete nominal entities** as participants. The verb then codes either the physical **action**, or physical **change**, or spatial **motion** of those concrete nominal participants. But this is again a matter of degree. Thus, 'shoot', 'kick', 'break' or 'run' are fairly concrete, but the less prototypical 'hear', 'see' or 'contemplate' codes invisible mental events, with no discernible action or change. And the even less prototypical 'depreciate', 'elapse', 'mean' or 'equal' are less concrete yet, involving abstract notions, conventions or inferences.

● **Complexity and spatial diffuseness**

While not always as multi-featured as nouns, prototype verbs often exhibit considerable semantic complexity. This is due in part to the fact that prototypical events or actions often involve **several participants**. Thus, for example, a typical event of 'giving' involves a giver (agent), a gift (patient) and a recipient (dative), all distributed over space and each an individuated, spatially compact, temporally durable nominal entity in its own right.

Many verbs also have complex temporally-sequenced sub-components, as in, for example, 'build', 'cook', 'compose', 'carve', 'draw', 'hunt' etc. But here again one may find gradation, so that some verbs are less temporally complex, involving only a single feature of change, as in e.g. 'cool off', 'elongate', 'fall', 'wake up', etc.

● **Agency and mental activity**

Many prototype verbs code **actions**, i.e. events initiated deliberately by a human or animate **agent** capable of **volition**. Such verbs are, for example, 'talk', 'leave', 'walk', 'attack', 'explain', 'argue', etc. Other verbs involve no concrete action but some **mental activity**, as in e.g. 'want', 'know', 'understand', 'think', 'regret', 'dream', etc. Such verbs often denote the **mental state** rather than change or volition. Finally, some verbs code events or state that involve neither action nor mental activity, as in 'fall', 'heat up', 'deteriorate', 'dry up', 'break down', 'elapse', 'be', etc.

8.6.4 Adjectives

While prototype nouns code bundles of co-experienced features ('horse', 'chair', 'woman', 'tree'), the cognitive status of adjectives is a bit more murky. In some respects, adjectives recapitulate one feature of verbs – the fact that a verb-coded event ('break', 'walk', 'talk to', 'give', etc.) cannot be experienced independently of its noun-coded participants. In a similar vein, prototype adjectives are not experienced directly q*ua* adjectives. Rather, they are single properties of prototype noun entities, abstracted from those more-complex bundles of experience. This facet of adjectives is alluded to, somewhat obliquely, by Bertrand Russell:

(55)   "…The universal whiteness is a *concept*, whereas a particular white patch is a *percept*….Such *general qualities* as whiteness never exist in time, whereas the things that do exist in time are all particular [percepts of nouns]…" (Russell, *Relations of universals and particulars*; in Russell 1956, p. 122; bracketed material added)

If one translates Russell's 'percept' as 'experience', then it may be said that 'white' is only experienced directly when it is bundled together with the other properties of a noun-coded white entity such as 'horse', 'wall', 'egg', 'cloud', 'snow', etc. From this central fact about adjectives follow most of their other main semantic properties.

● **Temporal stability**

Many languages do not code durable single properties of nouns as adjectives, but as stative verbs or even nouns. But as Dixon (1982) has noted, if a language has the lexical category *adjective* at all, it tends to include, at the very least, the most **durable physical properties** of prototype nouns: size, shape, color, consistency, texture, weight, smell, taste. This reinforces our view (and, incidentally, Russell's) that prototype adjectives are single-property concepts abstracted from the direct experience of multi-property noun entities. It also explains why prototype adjectives occupy the same extreme time-stable end of our temporal stability scale as prototype nouns.

Less prototypical adjectives may code durable but *non-physical* states or character traits, such as 'good', 'bad', 'brave', 'cowardly', 'helpful', 'impetuous', 'contemplative', 'thoughtful', 'conservative', etc. The fact that such states are mental or evaluative rather than physical may contribute to their lower temporal stability.

Likewise, less-prototypical adjectives may also code temporary states, such as temperature ('hot', 'cold'), feelings ('happy', 'sad', 'angry', 'cheerful', 'attentive', 'distracted'), health ('well', 'ill') or social states ('busy', 'idle', 'unavailable', 'friendly', etc.).

● **Simplicity**

Prototypical adjectives are single-feature concepts, abstracted out of more complex experience of noun entities or verb-coded events. This fact accounts, at least in part, for some adjectives exhibiting lower temporal stability than prototype noun entities. In nouns, as we've noted, while one of the clustered features may be less time-stable, the others may be durable. Thus, while a 'person' may change in size, strength or age, its humanity, animacy or gender – and whatever else those entail – endure much longer.

● **Concreteness**

The most prototypical, time-stable adjectives are durable physical properties of concrete nouns (Dixon 1982). It is their single-feature status, their simplicity, that makes them more abstract than prototype nouns.

● **Inherentness**

Since the perceptible physical traits of nouns tend to be their most time-stable features, they are also the nouns' most *inherent* properties. To some extent, this carries over into non-physical adjectives, particularly those that code evaluative judgements of character traits, such as 'good', 'bad', 'brave', 'thoughtful', 'nice', 'mean', etc. By analogy with the prototype of physical adjectives, these too tend to be considered inherent properties of the human or animate entity. The cultural-cognitive ontology implicit here is that character traits are like physical traits, largely fixed for the duration of one's life.

Our scale of temporal stability of the three lexical word-classes may be summarized as follows:

(55) **Scale of temporal stability**

most stable .... **least stable**

tree, green   sad, know   work, shoot
- -
noun adj   adj verb   verb   verb

8.7   Some evolutionary correlates of spatio-temporal experience

8.7.1   Preliminaries

Having noted, after Kant, that the most primitive dimensions used by sentient beings to construe their experience must have been linear time and three dimensional space, it is of interest to see if the evolutionary progression of bio-organisms points to anything remotely capable of supporting such a conjecture. To start with, the logic of time-space concepts suggests an asymmetrical, one-way-conditional relation between space and time, so that time is independent of space but space presupposes time. That is:

(56)   space ⊃ time (but not vice versa)

In plain words, no entity can exist in space unless it also exists in time; but some entities are more abstract, and thus exist only in time but not in space.

8.7.2   Experience in a one-dimensional universe of linear time

Consider first mono-cellular organisms that, given their small size, float freely in the warm primordial aquatic soup. They have no capacity for controlled motion, and their small amoeba-like size makes them indifferent to gravity, thus

to the vertical dimension of space. Their sensory input is not spatially-biased, but is distributed roughly equally on all sides. So is their access to water-soluble chemicals or floating biological nutrients. Such organisms bear testimony to their indifference to spatial dimensions by having **spherical symmetry**, presumably because relevant input is distributed equally in all directions. The only primitive dimension they seem to be sensitive to is linear time. This is evident from the fact that their growth and propagation, by cell division, is strictly timed by their metabolism, which in turn is also finely timed. They divide virtually on cue, every few minutes. The mechanisms by which they 'reckon' time are strictly biochemical, a highly reliable metabolic clock. Reaching a certain protoplasm size, they split, by a well-known process called **mitosis**, whereby first the chromosomes double their number by each reproducing a matching double, then separating and migrating to two opposite poles within the protoplasm. The cell membrane then pinches itself in the middle, whereby the one becomes two, each now carrying a full set of chromosomes and a roughly-equal portion of the protoplasm. In multi-cellular organisms like ourselves, non-sexual cell division proceeds essentially the same way to this very day.

The external **cell membrane** of mono-cellular organisms is, incidentally, the first instantiation of clear separation between the cognizing organism and the external world, as well as of our axiom (40) of **no direct access** to knowledge of the now-well-segregated external universe.[23]

Time is a linear ordered dimension of successive adjacent points, governed by a strict logic of **precedence**, which may be given as:

(57) a. **Transitivity**: If point *a* precedes point *b*, and *b* precedes *c*, then *a* also precedes *c*.
  b. **Non-reflexivity**: Point *a* cannot precede itself.
  c. **Non-reciprocity**: If point *a* precedes point *b*, then *b* cannot precede *a*.

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23. Roughly speaking, a mono-cellular organism, past the most primitive stage, is held inside its external *cell membrane*. Inside that membrane one finds the *protoplasm*, the bulk of the cellular body, with various *organelles* (mitochondria, chloroplasts) responsible for metabolism (growth, maintenance). The *chromosomes*, responsible for genetic inheritance, are made of nucleic acids (RNA or DNA), and are either dispersed in the protoplasm or held inside the internal membrane of the *nucleus*.

d. **Exclusivity**: If point *a* directly precedes point *b*
and *b* directly precedes *c*, then there could be no other point
such that it both follows *a* and precedes *c*.

Entities like the mono-cellular organisms described above exist, as far as
their cognition is concerned, in a uni-dimensional temporal universe. Their
experience of unique entities in their cognized universe must be assumed to
abide by the following criteria of time-stability:

(58) **Time-stability criteria for unique entities**
a. Entity *x* is unique if at any point *a* in time it is identical to itself and
only to itself, but not to any other entity *y*, *z*, etc.; and further,
b. If at any point *b* in time that directly follows *a*, entity *x* is still iden-
tical to itself and only to itself.

8.7.3 Experience in a universe of time plus one spatial dimension: Early stationary organisms

In order to construe entities that are distributed not only in time but also
in space and then guarantee their uniqueness, one needs to consider another
criterion, that of **spatial exclusivity**:

(59) **Spatial uniqueness of entities at any given time:**
"An individual entity *a* is always identical to itself, and never to any
other entity *b*, *c*, *d*, etc., if at any given time it occupies a position in
space that cannot, at the same time, be occupied by any other entity".

Criterion (59) needs of course to allow for common apparent exceptions such
as enclosure or part-whole relations; that is, allow for **complex entities**. as in:

(60) a. She carried the baby in her womb.
b. Trees are made of roots, trunk and leafy branches.
c. The salt was dissolved in water.

Presumably, such cases can be handled by recognizing **hierarchically struc-
tured** complex entities, with nested sub-parts and a cyclic bottom-up applica-
tion of criterion (59).[24]

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24. For a general discussion of the definition of complexity as hierarchic struc-
ture, see Simon (1962), Givón (2009, ch. 1).

Consider now the life of an early multi-cellular organism, say a member of the *coelenterata* phylum such as sea anemones, that is heavy enough to be subjected to **gravity**, and thus sinks downward at the larva stage till it lands on, and attaches itself to, a rock or the ocean floor. The sensitivity of such organisms to one spatial dimension, the **vertical**, is obvious from their strong vertical body-shape differentiation: Their bottom is fashioned to be attached to the rock or ocean floor, and their top is occupied by flexible food-grabbing tentacles and sensory organs sensitive to light, touch and chemical input (smell/taste), all surrounding the upward-pointing opening of the alimentary canal. The reason for the **vertical differentiation** of such organisms is obvious – being on the ocean floor, all the relevant sensory and food input comes from above. In contrast, their horizontal radial symmetry suggests utter indifference to further front-back and left-right differentiation of their horizontal plane. Given their stationary attachment to the bottom, further body-design or cognitive differentiation beyond the vertical is irrelevant to their adaptive needs.

Sea anemones appear to have the same adaptively-determined orientation as shrubs and trees: A very strong vertical differentiation, in the case of flora dividing the nutrient-absorbing roots from the sunlight-demanding leaves, but relative indifference to the two horizontal dimensions, whose input from the four winds is roughly equal.

8.7.4 Motion and the advent of a three-dimensional universe

Suppose you took a sea anemone now, detached its base from the rock, topple it on its side, and then endowed it with capability for motion – by either wiggling its body, flapping its flexible tentacles, or crawling on the ocean floor. If it now moved towards food, it is the former top, with its digestive-cavity opening, flexible grabbing tentacles and sensory capacities, that will become the new **front**. And with the body now being prone, the former vertical axis is now the front-back axis – given the organism's coherent motion towards potential food-source or away from predators. This forward-moving organism now has, perforce, two added spatial dimensions to contend with: The new vertical dimension of up/down – **back vs. belly**; and, unless it moves by corkscrew wiggle, the added third spatial dimension of **left vs. right**.

The organisms we just described are well known, e.g. moving marine mollusks or aquatic worms. Their second spatial dimension, the new vertical, is adaptively significant, since more input of either light or gravity-affected nutrients comes from above rather than from below. What is more, if they move

by crawling on the ocean floor, the up-down differentiation is even more adaptively significant. Their third spatial dimension, on the other hand, while being a necessary consequence of their prone orientation and front-ward motion, is adaptively superfluous, leastwise for the moment. This is evident from the fact that they exhibit full left-right symmetry.[25]

8.7.5   Purposive motion and the advent of agency

With the rise of forward-moving aquatic mollusks and worms, the general spatial design of higher organisms, the vertebrates, has been set in cement, seemingly for eternity. Their feeding aperture and perceptual capacities – the latter soon giving rise to a central-controlling nervous system, the brain – are increasingly concentrated in their motion-defined front. And while their motion towards nutrients may have at first been random, it soon becomes governed by the direction of perceived food. Which eventually brings about **controlled purposive motion**, toward food or away from threatening predators.

Purposive motion, as well as a growing capacity for grabbing either free-floating food or self-propelled prey, has now rendered our forward-moving organism a **volitional agent**. Its prior cognitive universe of dumb nouns and stative adjectives has now become a universe of **active-agentive verbs**, both of intransitive motion ('move toward the light'), of action upon dumb objects ('eat the kelp') and other purposeful animates ('catch the fish', 'mate with the male').

Without implicating humans and their sophisticated cognition, action and language, we have nonetheless arrived at organisms whose sensory-motor-cognitive capacities are sophisticated enough for survival in a spatio-temporal universe. Not only that, but organisms whose cognition and behavior must construe and navigate such a universe. Such organisms must now be able to differentiate between a growing variety of dumb objects, some adaptively irrelevant, others potential food, breeding sites or hiding sites; others moving randomly, harmless and unthreatening; others moving purposefully, perhaps potential prey striving to escape; others yet potential predators bent on devouring you, or potential conspecific mates.

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25. The advent of the *left-right asymmetry* of the higher-vertebrate brain is still aeons to come.

But what cognitive capacities are required for differentiating random vs. purposive motion? Put more narrowly, how does one spatio-temporal moving organism make judgements about the volition and agency of another?

8.7.6 From purposive motion to causation and agency

Purposive motion toward food source (prey) or away from danger (predator) could have been the *ur*-action that gave rise to sentient-beings' *ur*-concept of agency. While still free-falling and swaying with the tides in the primordial soup, the pre-motile organism may have already been capable of the following default inference:

(61) **Inference about random motion as the default ground:**
"If it doesn't break the statistically-more-frequent background norm of the multiple entities that float either randomly or downward all around me, it must be, at most, part of the spatial *ground* that demands no further adaptively-urgent attention".

Construing a volitionally-moving agent, on the other hand, required the following complex set of linked inferences:

(62) **Motion under own power and the inference of intention or purpose:**
a. If an entity is a less-common, smaller figure standing out over the larger ground (the norm); and
b. If its motion seems non-random, violating the statistical norm of either random sway or steady gravity-controlled sinking; and
c. If it is larger than the normal gravity- or tide-impelled flotsam; and
d. If it looks and moves and behaves sort-of **like me**;
e. Then its motion may also be considered **like my motion**; and
f. Given what I know **by direct access** about my own purposive motion;
g. Then this moving entity must be impelled to move by the same invisible **internal force** that makes me move – **purpose, intention**.

Inference (62d) also reveals another ontological pre-condition to knowledge, this one contrasting with axiom (40) above, the one that decreed no direct access to knowledge of the external world. Inference (62d) now allows exceptions to (40) just in case the object of cognition is either the **cognizer itself** or one **like the cognizer**. That is:

(63) **Axiomatic inference of other entities' volition, purpose and agency:**
   a. I, the cognizing organism, have privileged direct access to my own mind, thus privileged **self-knowledge**.
   b. By extension, then, when other animate-looking entities that are **like me** also seem to move non-randomly, just like me, then
   c. I am entitled to infer that their non-random motion is due, just like my own non-random motion, to their **volition**, **purpose** and **agency**.
   d. In this limited instance, then, of interpreting the non-random motion of other animates that look like me, I may claim the same direct access to their mind as I have to my own.

Inference (63) is at the bottom of our intuitive assumption that we can have access to **other minds** (see (65) below).

Re-consider now the most common verb types listed in (53) above, with just a few additions:

(64) a. The horse **galloped**
      b. The rock **fell**.
      c. The man **went** to the store
      d. The cocoanut **fell** to the ground.
      e. The woman **hit** the horse
      f. The cocoanut **hit** the child.
      g. The girl **sent** her brother to the store.
         ----
      h. The woman **wanted** to leave.
      i. The child **knew** that her mother was there.

Event types (64a,c,e,g) all involve animate subjects, and thus supply the type of data-base that should allow the cognizer to infer a volitional-purposive agent **acting under its own power**; that is, axiom (63) above. Event types (64h,i), with an animate dative subject, suggest another set of possible inferences to supplement (63) above:

(65) **Axiomatic inference of other minds:**
   a. Some of an entity's volitional acts may be **invisible**, thus **entity-internal**;
   b. Now, if that entity is **like me**,
   c. Then such invisible internal acts must be – like mine – **mental**.

8.7.7 The ontology of causation

The intended agentive-transitive events such as (64e,g) above raise another issue: What is the experiential justification, and the chain of inferences from obvious to less obvious, that license the cognizer to consider an event as the product of 'causation'? Two distinct inferential steps seem to be involved here. We will take them in order.

(a) **From temporal sequentiality to logical conditionality**

The notion of 'cause' is not the product of direct observation. Rather, it is a **metaphysical construct**. This construct is arrived at by re-branding some event *a* that

- precedes another event *b* in time, and
- has a one-way conditional relation to event *b*

as the 'cause' of event *b*. The first inferential step is thus a logical extension from temporal precedence to logical-conditional necessity:

(66) **Inference from temporal precedence to logical conditionality:**
"If an event *a* always precedes event *b* but never vice versa, and if event *b* never occurs unless event *a* occurs first, then event *a* must be the **logical pre-condition** to event *b,* so that a **one-way conditional** relation holds between them; that is: $b \supset a$".

(b) **From conditionality to causality**

By an act of *metaphysical fiat*, now, event *a* that always precedes event *b* and is thus its logical pre-condition is re-branded as the 'cause' of event *b*:[26]

(67) **Metaphysical re-branding of conditionality as causality:**
"If event *a* always precedes event *b* but never vice versa, and if in addition event *b* never occurs unless event *a* has occured first, so that event *a* is the logical pre-condition to event *b*, then event *a* is re-branded as the 'cause' of event *b*".

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26. Esa Itkonen (i.p.c.) has objected to my branding the notions of 'cause' and 'causer' metaphysical, suggesting that they are, instead, sound empirical observation with considerable psychological reality (Itkonen 1983). I agree that causation is an important *explanatory* concept with manifest *psychological* reality, as is suggested in (67) and (68), as well as (73) further below. But that does not make it less metaphysical.

'Causes' are events commonly – though by no means exclusively – involving a volitional agent that initiated the 'cause' event. Such an agent can now itself be re-branded, by another metaphysical *fiat*, as the 'causer' of the resulting event. That is:

(68) **Metaphysical re-branding of agent of cause as causer:**
"If the behavior of a volitional agent initiates – thus 'causes' – an event *a*, and if event *a* is branded as the 'cause' of event *b*, then the agent that initiated and 'caused' event *a* can also be branded as the 'causer' of even *b*".

The metaphysical *fiat* (68) is originally due to Zeno Vendler (1967), who interpreted it as a transformation from **cause event** to **causer agent**. That is:

(69) a. Because John stayed, Mary left.
      b. Ergo, John's staying causes Mary to leave.
      c. Ergo, John caused Mary to leave.

8.8 The ontological unity of experience, action and interpersonal behavior

8.8.1 Preamble

We started our ontological exploration by entertaining Wittgenstein's assertion that our relevant universe is exhaustively mapped by our cognition or language, so that 'the limits of my language are also the limits of my world'. We also noted that this could only make sense if the world in question were the Kantian *Welt für Uns*, a world mapped by our cognition. And that in this sense Wittgenstein's claim is *tautological*, true by definition and thus, in his own terms in the *Tractatus*, vacuous.

Taking the Kantian two-faceted universe for granted as our point of departure in the sentient organism's **discovery** – or **construal** – of the accessible universe, we can now see that the act of mental construal of both facts and explanations is tantamount to a gradual **expansion** of one's universe. So that, while physics has traditionally prided itself as the meta-discipline of human science, in a fundamental way it is the science of mind/brain and language – including our human-constructed math – that sets the upper limits on the universe that is accessible to investigation by the physicist. In this section I will probe this expanding range of construal not outward, towards the Kantian external universe, but inward, toward our personal and inter-personal universe.

8.8.2 Causality, agency and information: Norms vs. counter-norms

From the previous discussion it has emerged that the expansion of human knowledge is not a passive Empiricist enterprise of acquiring bits of 'objective' knowledge about the external Carnapian world, but rather an active process of construing, gradually, more and more of a partly-subjective Kantian universe. This process may be described as one of **informational integration,** whereby bits of newly-construed information that make no sense by themselves are integrated into a pre-existing network of previously-construed – and well-integrate – knowledge. This is fully consonant with Posner's (1975) and Smith and Kosslyn's (2005) view of **complex mental structures**. It is just as consonant with Spitzer's (1999) view of long-lasting knowledge and memory – both semantic and episodic – as a **network of nodes and connections**, as well as with Gernsbacher's (1990) view of comprehension as a process of **structure building**.

Now, since new bits of knowledge, be they perceived or construed, are potentially infinite, and since the organism's finite lifetime and immediate task-demands impose strong restrictions on how much information can be attended to at any given time, a stringent measure of **selectivity** must be imposed on competing simultaneously-construed bits of new information, and thus an imposition of strict **task-urgency** considerations. This is in line with the vast literature on **selective attention**.[27]

The first and most general consideration involves the notion of **norms vs. counter-norms,** and the definition of "new information" in terms of frequency-distribution. In this connection, recall our earlier discussion (ch. 2) about the difference between topical vs. non-topical referents, a difference that involves a strong frequency bias – important topics are **figures** that are much more rare than unimportant ones, the **ground**. Recall also our earlier discussion (ch. 3) of the pragmatics of negation:

(70) a. **norm**   b. **counter-norm**

A: Hi. What's new?   A. Hi. What's new?
B: My wife is pregnant   B: My wife is not pregnant.
A: Oh, how nice! Congratulations!   A: Oh, I didn't no she was supposed to…

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27. See Posner (1975, 1978, ed. 2017), Smith and Kosslyn (2005), *inter alia*.

We noted there that negative information is only valid in the context of the corresponding affirmative having been presupposed, thus made the **norm** or **ground**. But why is this so?

The strong restrictions on negative information noted in ch. 3 only make sense in the context of high-frequency norms (ground) vs. low-frequency exceptions (figures), whereby valid "information" may be described as a surprise vis-a-vis the expected high-frequency norm. That is, as **novelty**. Telling people what is the common, frequent case is not of much interest, since we take it for granted they already know that (Grice 1968/1975). Only information that violates the high-frequency norm is of interest. This is why the affirmative (70a) is valid new information. Wives in our culture are most of the time not-pregnant, so that their pregnancy is an exception to the frequency norm, and thus informative.

This account is fully consonant with what we know about figure-ground relations in perception and cognition: The figure is only salient if it is a greater **statistical rarity** vis-a-vis the high-frequency ground. It is the perceptual repetitiveness – thus, paradoxically, the seeming emptiness – of the vast ground that makes the statistically more rare and perceptually smaller figure salient information. That is:[28]

(71) **The Frequency definition of information:**
"A frequent, recurring experience soon loses its informational saliency and becomes **ground**. A rare, surprising experience is informative and salient, thus a **figure**".

Which brings us back to the discussion of causation and agency as explanation. What makes an event salient new information is that it stands out on the statistically-prevalent ground, or norm, of non-events. That is, non-events – **stasis** – are the statistical norm, and events – **change** – the counter-norm. What

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28. In re-acquainting myself with Shannon and Weaver's (1949) classic, a mathematical approach to communication, I was struck by how detached it was from any consideration of the mental state of the recipient/interlocutor, and thus from a pragmatic – contextual – definition of 'information'. Likewise, it seemed detached from the figure-ground perspective that underlies perception, cognition and attention. However, Attneave's (1954, 1959) adaptation of Shannon and Weaver's mathematical theory of information does include frequency and figure-ground as important criteria for 'informativeness'. And the figure-ground perspective, thus at least implicitly a frequency-dependent definition of information, is a core ingredient of Gestalt Psychology (e.g. Koffka 1935).

impels us to explain events in terms of causation, rather than leave them be as merely temporally sequenced or, at best, occurring in a selective temporal order (one-way conditional), is the imperative of **explaining what is not obvious**, what is not predictable from the general frequency norms, what is surprising. In this connection, recall our discussion (ch. 1) about the initial abductive step in the cycle of scientific discovery (Hanson 1958):

(72) **Hypothesis formation by abduction:**
    a. New facts *a,b,c* don't fit into – perhaps even contradict – current theory *X*.
    b. But if a new theory *Y* could be devised,
    c. Such that the new facts *a,b,c* would fit snugly into it,
    d. Then, till further notice, new theory *Y* must be the case.

What makes new facts intriguing both to the organism and to the scientist, and thus **demanding explanation**, is that they violate the prevailing frequency norm, the domain of old, well-plowed facts and the prevailing theory that accommodates them. The cognizing organism's integrated knowledge – our current coherent theory – advances gradually under the impact of surprising new facts that violate the current frequency norm. Given this perspective, causal explanation of events, and of their conditionally-ordered temporal sequence, makes perfect sense, since it purports to explain surprising, non-obvious counter-norms. That is, in full parallel with (72) above:

(73) **The abduction of causal explanation by the cognizing organism:**
    a. Event *b* always follows event *a*, a fact that doesn't fit into our current non-causal theory *X*.
    b. But if we replaced our non-causal theory *X* with a new causal theory *Y*, in which event *a* is viewed as the 'cause' of event *b*, the fixed conditional order of the two events now makes perfect sense.
    c. What is more, we know from personal introspection that the most natural explanation of caused events that we ourselves have partaken in is our own intensional action as agents.
    d. Therefore, an intentional agent of event *a* must have 'caused' event *b*.

Our metaphysical concept of 'cause' thus turns out to be a reasonable explanatory construct within the procedural norms of scientific inquiry. Through such procedures, new facts are always evaluated in the **context** of the current theory – a.k.a. **current knowledge**.

8.8.3   Context, behavior and communication

Whatever the original impetus for the rise of human sociality,[29] it must have evolved hand in hand with human communication. Both are heavily dependent on trying to assess the knowledge (epistemic) and intention (deontic) states of one's interacting conspecific. In the case of social behavior, such assessments are a prerequisite for empathy and cooperation. In the case of communication, such assessments, at any given point during a communicative transaction, allow the speaker to capitalize on what the hearer already knows, so that only non-redundant information needs to be communicated. Communication thus abides by the same principles that govern the acquisition of information from the external environment; that is, in full accord with our figure-ground principle (71) above:

(74)   Only information that is not predictable to one's interlocutor from either one of the three traditionally-accessible sources of knowledge needs to be transacted. Those three information sources are:

- **Generic-cultural knowledge** of the external, social and mental world;
- **Situational-deictic knowledge** available to all present on the current scene;
- **Discourse-specific information** previously transacted in the current discourse.

In the process of communication, information from these three sources must be considered the current high-frequency background norm, the ground or **communicative context** vis-a-vis which chunks of new information are transacted and evaluated – given the speaker's assessment of the hearer's **deontic** state of readiness and willingness to accept the new information (Grice 1968/1975).

The three sources of background information in (74) correspond, within bounds, to the three well-known cognitive capacities described by psychologists of memory and attention (Attkinson and Shiffrin 1968; Squire 1987; Schneider and Shiffrin 1977; Posner 1975, 1978; Baddeley 1986, 1992; Smith and Kosslyn 2005; *inter alia*); respectively:

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29. Over the years, evolutionary anthropologists and psychologists have proposed many precursors to human sociality as 'the' impetus for our social evolution; among them mother-infant bonding (Hrdy 1999), mating (Miller 2000), brain size (Dunbar 1992, 1998), and religion (Dunbar 2017), *inter alia*.

(75) a. Permanent semantic memory
      b. Current attention focus and/or working memory
      c. Permanent episodic memory

All three predate human communication, and are the cognitive prerequisites to both our sensory and motor interaction with the external Kantian universe. Communication simply piggy-backed on them, and they still define the communicative context – or ground – vis-a-vis which we transact new chunks of language-coded information.

8.8.4   The outer bounds of information

One may as well recall, lastly, Wittgenstein's critique of the uselessness of deductive logic as a means for transacting new information:

(76) "…The propositions of logic are tautologies. Therefore the propositions of logic say nothing (They are the analytical propositions)… It is clear that one could achieve the same purpose by using contradictions instead of tautologies… The propositions of logic demonstrate the logical properties of propositions by combining them so as to form propositions that say nothing… Not only must a proposition of logic be irrefutable by any possible experience, but it also must be unconfirmable by any possible experience… Hence there can *never* be surprises in logic…" (1918, pp. 121–129)

In his inimitable way, Wittgenstein thereby excluded all logic-bound axiomatic systems from relevance to human communication. This must be so because our language-coded communication demands that new information be *both* surprising (non-tautological) and compatible (non-contradictory) – vis-a-vis the context of currently-organized knowledge. It is our reliance on that pre-existing context that makes human language the instrument of communication that it is.

Chunks of new language-coded information must straddle an **informational middle ground** between tautology and contradiction. The first gives us no incentive to attend, the second denies our presuppositions. It is only by constant recourse to the hearer's knowledge context, be it generic, situational or discourse-specific, that we communicate using human language.

8.9   **Closure**

The conclusion to this chapter is also the conclusion to the book, though it is still not clear to me how such a book can be closed. To the extent that one could highlight first the methodological perspective pursued here, it amounts to a repudiation of the Platonic-Saussurean-Chomskian tradition of idealization, thus the linguist's exclusive reliance on the introspective method that discerns a clean 'underlying' system – *competence*, *langue*, *essence* – underneath the messy reality of language use. In this connection, the Cynic philosopher Diogenes of Sinope is reputed to have had the following exchange with his nemesis, Plato:

(77)   "…As Plato was conversing about ideas and using the nouns "tablehood" and "cuphood", he [Diogenes] said: "Table and cup I see; but your tablehood and cuphood, Plato, I can nowise see". "That's readily accounted for" said Plato, "for you have the eyes to see the visible table and cup, but not the understanding by which ideal tablehood and cuphood are discerned…" (Diogenes Laertius, *Lives of the Eminent Philosophers*, vol. II, p. 55)[30]

This book is thus, first, a plea to expand our data-base past Saussure's *internal linguistics* and Chomsky's *competence*, to language-use and the behavioral data of communication, cognition, neurology, diachrony and acquisition.

To the extent that the theoretical perspective pursued here can be summarized independently of the method, this book suggests, first more narrowly, the inter-dependency of three perspectives on language:

- communicative function
- diachronic change
- cross-language diversity.

But these are but the bare top of a large – and largely submerged – iceberg. The main theoretical thrust here is a plea for de-segregating our understanding of

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30. On the face of it, Plato trumped the Cynic, having had the last word. Which brings to mind an apocryphal account by my late friend Pete Becker, who recalled Gregory Bateson's report upon returning from the celebrated Piaget-Chomsky debate on *Language and Learning* (Piattelli-Palmarini ed. 1980). "Piaget was right", Bateson is reported to have said, "but Chomsky won the debate. That Chomsky, what a gutter fighter".

language from the narrow disciplinary bounds imposed on us for the past 100 years by various schools of structuralism. It is thus a plea for looking at language in its broadest context, especially in terms of its cross-disciplinary connectivity to mind and brain and the empirical disciplines that investigate them; then onward to culture and, ultimately, evolutionary biology.

While the explorations by our philosophical forebears have been indispensable to understanding the roots of our current predicament, it is important to liberate linguistics from the kind of pre-empirical presupposition about clean, pristine, analytic systems that philosophers and logicians, by the very nature of their method, have imposed on language over the millennia. For the dirt that comes with messy behavioral data may be salutary and revealing, rather than just *performance noise* that obscures *the system* and must be filtered out. To cite an inspired poet:

> Ring the bells that still can ring,
> Forget your perfect offering,
> There's a crack in everything,
> That's how the light gets in.
> L. Cohen, *Anthem*

Abbreviations of grammatical terms

3sm	3rd person singular masculine
ACC	accusative
ADJ	adjective
DIR. OBJ.	direct object
FUT	future
IND. OBJ.	indirect object
JUSS	jussive
NREF	non-referring
OBJ	object
PERF	perfect
PRET	preterit (perfective, past)
REF	referring
SUB	subordinator
SUBJ	subject

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General index

Languages index

In his foreword to the original edition of this classic of functionalism, typology and diachrony, Dwight Bolinger wrote: "I foresee it as one of the truly prizes statements of our current knowledge ... a book about understanding done with deep understanding – of language and its place in Nature and in the nature of humankind... The book is rich in insights, even for those who have been with linguistics for a long time. And beginners could be thankful for having it as a starting point, from which so many past mistakes have been shed". Thoroughly revised, corrected and updated, On Understanding Grammar remains, as its author intended it in 1979, a book about trying to make sense of human language and of doing linguistics. Language is considered here from multiple perspectives, intersecting with cognition and communication, typology and universals, grammaticalization, development and evolution. Within such a broad cross-disciplinary context, grammar is viewed as an automated, structured language-processing device, assembled through evolution, diachrony and use. Cross-language diversity is not arbitrary, but rather is tightly constrained and adaptively motivated, with the balance between universality and diversity mediated through development, be it evolutionary or diachronic. The book's take on language harkens back to the works of illustrious antecedents such as F. Bopp, W. von Humbold, H. Paul, A. Meillet, O. Jespersen and G. Zipf, offering a coherent alternative to the methodological and theoretical strictures of Saussure, Bloomfield and Chomsky.

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