Interfaces in Grammar

Edited by Jianhua Hu and Haihua Pan

Language Faculty and Beyond 15

Internal and External Variation in Linguistics

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Volume 15

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CHAPTER 1

Introduction

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If human language were solely governed by and thus a mere product of the faculty of language in the narrow sense (Hauser, Chomsky, Fitch 2002), then variations among languages would not be expected to occur. The reason why we speak different languages lies in the fact that the faculty of language itself, characterized as a recursive system, may not be directly responsible for the actual diverse forms of natural language, though it does constitute the core of language. It is thus hypothesized that language variations may result from the interfaces in grammar. As is well known, there are two kinds of interfaces. One is the interface at which the faculty of language interacts with other cognitive systems not solely devoted to language. The other is the one that is associated with the interactions between different modules of grammar including phonology, morphology, syntax, semantics, and even pragmatics. If it is the interface properties that are responsible for variations among languages, then these variations might occur not only at the interface between different modules of grammar, but also at the one between the faculty of language and cognition. Although the interface between the faculty of language and other cognitive systems is an important area of study, our priority has been given to those studies on the interactions between different modules within the grammar when selecting papers, as we believe that interfaces between these modules are closely related to the internal structure of the faculty of language, which interests most linguists working within the generative paradigm. To understand the internal structure of the faculty of language, we have to investigate not only each individual component of the language faculty, but also the connections and interactions between these components. As a matter of fact, an in-depth investigation into the interactions between different components of grammar may also provide a window into the connections between the faculty of language and cognition as well as the Basic Property of language: "a digitally infinite array of hierarchically structured expressions with systematic interpretations at interfaces with two other internal systems, the sensorimotor system for externalization and the conceptual system for inference, interpretation, planning, organization of action, and other elements of what is informally called 'thought'." (Berwick and Chomsky 2016: 89–90)

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This volume, as an important contribution to the theoretical and empirical study of the interactions of grammatical components in Chinese and other languages, consists of chapters investigating the common structural properties that may be considered as possible candidates for UG. It addresses syntactic and semantic issues such as anaphora universals over non-isomorphic languages, the role that the forces of attraction and repulsion play in the grammar of natural languages, computational and semantic aspects of resumption, the dichotomy between inner and outer reflexive adverbials, system repairing strategies at interfaces, the v-copy construction in Chinese, the scope of disjunction, interactions between focus, negation and event quantification, null object constructions and VP-Ellipsis, child language acquisition of nominal structure, word order and referentiality as well as second language acquisition of interface properties in Chinese double NP constructions.

In his contribution entitled "Unifying UG and language variation", Edward L. Keenan addresses the problem we often encounter in our study of Universal Grammar (UG). When we work on grammars of particular languages, we would try our best to characterize them as precisely as possible. Then the result is: the more we do precise work on different languages, the more their grammars assume specific traits not present in grammars of other languages under study. This will inevitably lead to the result that our grammars increasingly diverge rather than converge on some sort of UG. Then the challenge is how to find commonalities among non-isomorphic structures, i.e., how to generalize over increasingly diverse structures to find common structural properties that may be considered as candidates for UG. He uses the examples that concern Binding Theory to show that the anaphor-antecedent relation and the property of being an anaphor are universally invariant though grammars for different languages may not be structurally the same at any "level of structure".

The contribution "Elements of syntax: Repulsion and attraction" by Henk van Riemsdijk presents an autobiographical overview of his struggle in coming to grips with the undeniable central role that the forces of attraction and repulsion play in the grammar of natural languages. According to Henk van Riemsdijk, Martinet's principle of push chains and drag chains, which was thought to apply to both syntax and phonology, was a source of inspiration to him since 1967. He thinks that if there are some very general principles of design that co-determine the structure and functioning of syntax, it would be very strange to find that such principles are completely absent in phonology and vice versa. He points out that the fundamental formal similarity between phonology and syntax is one of the core insights of the late Jean-Roger Vergnaud's work.

In his contribution "Computational and semantic aspects of resumption", Alain Rouveret argues that the linking of resumptive pronouns to the periphery in Welsh

should be dealt with as a strictly narrow-syntactic phenomenon, not as an interface one. He finds that resumptive dependencies give rise to reconstruction effects, which can also be detected in intrusive dependencies involving a strong island with a different derivational history. It is shown that the internal structure of the pronouns involved is exclusively responsible for the various reconstruction options in both resumptive and intrusive dependencies, and that Welsh resumptive and intrusive pronouns may exhibit similar reconstruction properties, though with distinct syntactic origins, they are linked to the periphery via different mechanisms operating at different derivational levels.

The contribution "Causality, comitativity, contrastivity, and selfhood: A view from the left periphery and the *v*P periphery" by Wei-Tien Dylan Tsai is concerned with the dichotomy between inner and outer reflexive adverbials, which are claimed to have a far greater range of interpretative possibilities closely associated with their syntactic distributions when participating in anaphoric relationships. To account for the dichotomy between these two kinds of reflexives, Tsai proposes that the inner Self merges to the VP/*v*P layer, while the outer Self merges to the IP/CP layer. The inner selfhood is defined as comitativity plus a contrastive focus with a *v*P scope, expressing aloneness, privateness, and physical presence, while the outer selfhood is defined as causality plus a contrastive focus with a sentential scope, expressing voluntariness, exclusiveness, spontaneousness, naturalness, etc., depending on the kind of constituent subject to modification. It is pointed out that the "selfhood" discussed in the paper can be understood not only in terms of the general theory of syntax-semantics mapping, but also in terms of the "topography" of adverbials, which is by and large determined by their morphological makeups in a particular language.

The title of the contribution by Victor Junnan Pan is "System repairing strategy at interface: *Wh*-in-situ in Mandarin Chinese", which explores the role that prosody plays in clausal typing. In certain contexts, *wh*-words in Chinese are ambiguous between an existential reading and an interrogative reading. However, in actual conversations, the relevant *wh*-words are never ambiguous when different combinations of stress with intonation are placed on the relevant sentences. Pan claims that the encoded prosodic forms can be analyzed as phonological features in the feature bundles associated with a given lexical item in the Lexical Array. Since these prosodic features have semantic effects on the output of the computational system at the Conceptual-Intentional interface, they satisfy Legibility conditions, and therefore, they do not violate the Inclusiveness condition. However, prosodic marking is only activated as a last resort in cases where semantic ambiguity arises, which can be viewed as a system repairing strategy at interfaces in the sense of Reinhart (2006).

In his contribution "The v-copy construction in Mandarin: A case temporarily reopened", Huba Bartos discusses the so-called *verb-copy construction(s)* of Mandarin Chinese, where two (or even more) copies of the same verb surface in a single clause. Recent studies within the framework of the Minimalist Program (Chomsky 1995, 2000, 2001) show that these constructions involve both VP-level and V-level operations (V-copy is not one construction, but a group of surface lookalikes, with different underlying structures), and syntactic effects are heavily interspersed with semantic/pragmatic and phonetic considerations. However, some other recent contributions (Fang & Sells 2007; Hsu 2008) seem to call several assumptions of the earlier analyses into question, and present data neglected by those proposals. Bartos' chapter briefly reviews the earlier accounts, examines and mostly refutes the new potential counter-arguments, and refines the earlier analysis of himself to cater for the full range of structural variation involved, by incorporating certain compatible components of Gouguet's (2005) and Tieu's (2009) proposals.

In his contribution "The syntax of *either* and disjunction", Paul Law argues that the scope indicator *either* is base-generated in place in overt syntax, and disjunction is syntactically balanced coordination, whereas the structural relation between *either* and disjunction is subject to a phase-theoretic locality constraint to the effect that there can be no phase intervening between them. Under this analysis, *v*P, NP (or DP) and CP are all phases. It is claimed that apparently unbalanced disjunction where *either* does not occur adjacent to disjunction is in fact syntactically balanced coordination, with parts of the second disjunct possibly deleted by independent processes such as gapping or extraposition. Some facts recalling locality constraints on movement are shown to be due to conditions on deletion independent of movement.

The contribution "Focus, negation and event quantification in Chinese: How focus helps shape negation in natural language" by Peppina Po-lun Lee discusses the focus sensitivity of the two Chinese negators *bu* and *mei* (translated as "not" in English). It shows that *bu* and *mei*, though are both negators in Chinese, vary in their degree of dependency on focus: *bu* is assumed to be a focus-sensitive operator, with its interpretation totally dependent on the placement of focus when there is one, and focal mapping would then be triggered upon its direct association with focus. On the other hand, *mei* does not lexically encode a dependency on the placement of focus, and its seemingly focus sensitivity results from its dependency on the non-focused part. It is claimed that the role of focus in *mei*-sentences is to provide the backgrounded event description. Materials within the TP scope of *mei*, excluding the focus, will be structurally mapped to the background part to set up its restrictive domain, and everything within its scope to the nuclear scope.

Haihua Pan's contribution "Null object constructions, VP-Ellipsis, and sentence interpretation" discusses issues related to VP-Ellipsis and null object constructions

in Mandarin Chinese. It argues that it is not true that no null object construction (NOC) sentences can be analyzed as VP-ellipsis in Mandarin Chinese, and that the reason for the fact that the interpretation patterns of the relevant sentences deviate from those of their English counterparts is not because there is no VP-ellipsis in Chinese but because Chinese pronouns and reflexives exhibit some special properties different from those in English. It claims that the so-called NOC sentences are ambiguous in structure and can be analyzed as either VP-ellipsis or NOC. It further claims that it is not the parallel vs. non-parallel distinction but the semantic and discourse constraints of coordinate constructions with *too* and *ye* 'also' in VP-ellipsis that help explain why some VP-ellipsis sentences are ungrammatical in English and Chinese, respectively. Hence, discourse factors play a crucial role in the interpretation of coordination constructions in both Chinese and English.

The contribution "The acquisition of nominal structure, word order and referentiality in Chinese: Corpus and experimental findings on the numeral phrase" by Thomas Hun-tak Lee and Zhuang Wu investigates the mapping between nominal structure, word order and referentiality from the perspective of language acquisition, using early naturalistic child Mandarin data and experiments with preschool Mandarin-speaking children. It is argued that the Subject Specificity Constraint prohibits non-specific individual-denoting numeral phrases, though it does not exclude numeral phrases used for definite reference. It is shown that contrary to earlier studies, both Inner Modifier Nominals (IMN) and Outer Modifier Nominals (OMN) can be definite; their difference lies in the fact that while IMN can be specific or non-specific, OMN cannot be non-specific. It is found that Mandarin-speaking children are sensitive to the Subject Specificity Constraint from the very earliest stage of grammatical development, as they use numeral phrases primarily in object position for both specific and non-specific reference while using them in subject position only for definite reference or for denoting quantity. However, Mandarin-speaking children produce IMN sparsely, and do not use OMN in their naturalistic speech. While IMNs appear to some extent in the adult input to the children, OMNs are virtually absent. Thus the distinction between IMN and OMN is not visibly present in the positive evidence available to Mandarin-speaking children. The experimental findings in this chapter show that children have a poor grasp of the linguistic distinction between IMN and OMN, and the overall results indicate that interface properties that involve the mapping between nominal structure, word order and referentiality will take young children some years to acquire. It is concluded that given the poverty of the stimulus, the semantic difference between the two types of modified nominals, reflected in interactions with stress and focus, appears to be a late acquired interface property in child grammar.

The contribution "Syntax/semantics interface and interpretation of Chinese NP_1NP_2V construction by Japanese speakers" by Li Zeng and Dongfan Hua investigates the L2 acquisition of the interpretation of Chinese NP_1NP_2V construction by Japanese-speaking learners of Chinese. It argues that the canonical OSV interpretation of Chinese NP_1NP_2V is a syntactic phenomenon while the SOV interpretation of Chinese NP_1NP_2V involves the interactive effect of semantic compatibility and prominence, a phenomenon at the syntax-semantics interface. It is found that, while they can acquire the canonical OSV interpretation, Japanese speakers have difficulties in accessing prominence to distinguish the acceptable SOV interpretation from the unacceptable one. Their results show that the L2 acquisition of the syntax-semantics interface property is more difficult than that of the syntactic property.

In response to an increasing interest in interface studies on language, Jianhua Hu, Haihua Pan, Aijun Li, and Peppina Po-lun Lee organized a symposium on the interfaces of grammar in Beijing (19–21 October, 2011). The Symposium (International Joint Symposium on the Interfaces of Grammar), supported by the Innovation Project of the Chinese Academy of Social Sciences (CASS) and sponsored by the Department of Chinese, Translation and Linguistics and the Halliday Center for Intelligent Applications of Language Studies of the City University of Hong Kong as well as by the Hong Kong Polytechnic University – Peking University Research Center on Chinese Linguistics and the Commercial Press, brought together more than forty scholars working on phonetics, phonology, syntax, semantics, pragmatics, first language acquisition, and second language acquisition, with a focus on the interactions between different modules of grammar. After the Symposium, Kleanthes K. Grohmann, one of the series editors of the *Language Faculty and Beyond* (LFAB) of John Benjamins Publishing Company, contacted the organizers for the possibility of developing a book from the papers presented at the Symposium. We (Jianhua Hu and Haihua Pan) then took the responsibility to solicit papers. After a rigorous external review process, eleven papers were selected from the keynote and invited speakers for the volume. We are very much grateful to Kleanthes K. Grohmann and Pierre Pica for including the present volume in the LFAB series they are editing. We are also indebted to Anke de Looper, the editor of John Benjamins Publishing Company, for her editorial assistance. Sincere thanks should also go to all the reviewers of the chapters in this volume. Finally, we wish to express our deepest gratitude to Edward L. Keenan, Hen van Riemsdijk, Alain Rouveret, and all the other authors of this volume for their kindness in accepting our invitation and contributing their papers to the current volume.

Beijing, September 27, 2018

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CHAPTER 2

Unifying UG and language variation

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We consider the problem of formulating universal generalizations about natural languages given that as work on grammars of particular languages proceeds with increasing precision and detail, the specific form of and conditions on rules increasingly diverges. Formally the problem becomes one of how to generalize over non-isomorphic structures.

1. A challenge in linguistic theory

Theoretical linguists consider that ordinary natural languages – ones we grow up speaking, such as English, Malagasy, Mandarin,… are all cut from the same mold. They are all instances of the human linguistic faculty, as they all derive from our mind/brain, perhaps more specifically our faculty of language in the narrow sense (Hauser, Chomsky, Fitch 2002) and we have no reason to think that these differ across language groups. We have many cases in which young children from one language and culture area move to another early in life and learn the new language natively.

Now normal scientific standards of enquiry require that the grammars we define of particular languages – English, Malagasy, Mandarin,… be explicit, precise, and comprehensive. The latter requirement is crucial. Claiming that the generative mechanisms in several languages are the same or highly similar based merely on a small sample of each language is not scientifically compelling – we can just choose samples that appear similar. Rather it is entire grammars that we must compare (using to be sure ordinary statistical sampling techniques). This allows that we write the grammars of different languages in different, appropriate, symbolisms but then generalize over these grammars to find their commonalities.

Standard approaches to generative grammar do not however operate in this way. If they did, we would independently build grammars of different languages and then compare the results. Rather they tend to try to present the grammar of each language immediately as a special case within a universal notational format. The set

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of grammatical categories and features they can draw from is (largely) fixed, and the rule types they can use are fixed, though conditions on their application may vary.

The challenge we are concerned with here arises as follows. As we work intensively on formulating a grammar for a given natural language L, our formalizations become increasingly precise and specific to L. The result is that the more we do precise work on different languages the more their grammars assume specific traits not present in our grammars of other languages under study. Thus our grammars increasingly diverge rather than converge on some sort of UG (Universal Grammar). The challenge then consists of generalizing over increasingly diverse structures to find common structural properties that we may consider as candidates for Universal Grammar. In more technical jargon, how do we find structural commonalities among non-isomorphic structures?[1]

The purpose of this paper is to consider one case where we show how to do this. Our example concerns Binding Theory, in which it is commonly held (see Chomsky 1986; Buring 2005) that antecedents of anaphors c-command them and that this is part of UG. Here we show that this isn't true, but despite this morpho-syntactic diversity in the presentation of anaphor-antecedent pairs we still find a non-vacuous generalization which, I claim, is universal (or at least a plausible and falsifiable candidate for being a universal).

The following analogy may prove helpful. Imagine that you are a Martian examining the mathematical behavior of earthlings. You observe different mathematical "utterances" such as the following:

Budapest 203:7 = 29
63

Paris, Rio de Janeiro 203|7
63 29

Los Angeles, Beijing, Seoul
29
7|203
14
63
63

Our Martian studies these examples of mathematical behavior and figures out that the speakers start with two numbers, compute a third which when multiplied by the second yields the first. Ah! Epiphany! Earthlings divide! This latter is the explanatory generalization. Merely devising some deletion rules that derive the

1. For discussion of the relation between UG and the output of grammars of particular languages see Chomsky 1995: Introduction, and Culicover and Jackendoff 2005: Ch 2, though these works focus more on the general architecture of syntactic theory than the apparently more mundane issues we raise here.

Hungarian and French/Brazilian notations from the American one, or derive all from a common source, does not *explain* what these instances of behaviors have in common. Learning that Earthlings divide is the generalization, and it is not simply another notation.

2. A Binding Theory example

Drawing on Keenan&Stabler (2003) we present a mathematically rigorous concept of *language invariant* and illustrate morpho-syntactic invariants over structurally non-isomorphic expressions in different languages. We support two **Anaphora Universals**: for all NL (Natural Language) grammars:

A. Lexical anaphors are structural invariants and
B. The Anaphor-Antecedent (AA) relation is a structural invariant

For A,B to make sense we must provide a language independent definition of (*lexical*) *anaphor, the AA relation*, and *structural invariant*. Then we illustrate with model grammars (for real languages) how morphological identity is **structural** in exactly the same sense as notions like **c-commands, is a VP**, etc. In our model grammar of English, anaphors satisfy the expected c-command conditions. But in our model grammar of Korean, nominal case marking may override constituency; and in our model grammar of Toba Batak, representative of W. Austronesian languages, voice morphology overrides constituency. An example in the Appendix from Tagalog shows a combination of the Toba and Korean strategies. Our definition of *grammar* is intentionally broad, intended to cover all specific grammar formalisms (HPSG, LFG, Minimalism,…) and we intend to build into our notation no universal claims at all. All universals must be explicitly stated (axiomatically or derived as theorems).

Def 1 A **grammar G** can be represented as a four-tuple $<V_G, Cat_G, Lex_G, Rule_G>$, where, omitting subscripts, V and Cat are non-empty sets – the *vocabulary* and the *category symbols* respectively. (Note that for different G both the vocabulary and the set of grammatical categories can vary). The set of *possible expressions* is $V^* \times Cat$, noted PE_G. (In general, for A any set, A^* is the set of finite sequences of elements of A). Lex, the set of lexical items of G, is a *finite* subset of PE_G, and Rule is a set of *structure building* partial functions of bounded arity from $PE_G{}^*$ into PE_G (*bounded arity* = for some *n*, all sequences in the domain of F, are of length < n). L(G), the *language generated by* G, is the closure of Lex_G under the $F \in Rule_G$. That is, it is all the expressions built up by starting with Lex and applying the structure building functions any finite number of times. NB: an *expression* is an ordered

pair consisting of a string of vocabulary items and a category symbol. Possibly a natural grammar for English would have two distinct lexical expressions with the same string coordinate, as (*respect*,N) and (*respect*,V), or (*judge*,N) and (*judge*,V).

2.1 Definition of *structure*

Different theoretical approaches – LFG, HPSG, Relational Grammar, Minimalism,… assign different structures to even simple expressions such as *Dana is singing*. But they agree that *Dana is singing* and *Robyn is dancing* have the *same* structure. Relational judgments of *sameness of structure* provide a more robust basis for assessing universal claims than do absolute judgments of structure. On our view "the structure" of an expression is derivative – it is whatever it has in common with those expressions that have the *same* structure as it.

Grammars proposed in the literature often have just a few structure building functions: Merge (Move), Function Application, Type Lifting, Composition, perhaps Pred+Argument, Coordination, Negation (structure specific). Normally a structure building function is *partial* – it only applies to sequences of expressions satisfying certain conditions. Expressions derived by the same functions in the same way are *isomorphic*. So the *structure* of an expression codes its derivational history. A given expression may have many different structures.

A *structure preserving* map h from L(G) to L(G) is a bijection which doesn't change how expressions are constructed. If z is built by applying a structure building function F to a pair (x,y) of expressions then h(z) is derived by applying that same function F to the pair (hx,hy). So h(F(x,y)) = F(hx,hy). In the jargon of the business, structure maps are called *automorphisms*. And two (unambiguous) expressions have the *same structure* if and only if there is an automorphism h mapping one to the other (in which case its inverse maps the other to the one).

The *invariants* of a grammar G are those expressions, properties of expressions and relations between expressions,… that are unchanged by any automorphism. An expression which is mapped to itself by all the automorphisms is a *grammatical invariant* – it can't be replaced by anything else without changing structure, that is, without changing how expressions are derived. We expect case markers, voice markers, and other heads of functional categories to be grammatical invariants. On the other hand, proper nouns (of the same subclass – masculine, singular, etc.) are not invariant. An automorphism might interchange (*John*,NP_{prop}) and (*Sam*,NP_{prop}) since, pretheoretically, they are not structurally distinct. Note that we are not free to *stipulate* that an expression is invariant. Given a grammar its automorphisms are determined. Whether a given expression is mapped to itself by all of them is a theorem, not a stipulation. Similarly a property P of expressions is *invariant* if for all expressions x, if x

has P then h(x) has P, all automorphisms h.[2] We might expect that in a grammar of English the property of having category VP is a grammatical invariant – no automorphism could map a VP to anything other than a VP. But whether all automorphisms preserve all categories depends on the specific grammar we're looking at, it does not follow from the definition of grammar + invariant. Keenan&Stabler (2003) exhibit a model of agreement in which an automorphism may interchange the masculine and feminine agreement affixes and interchange the masculine and feminine nouns. So the property of being a N_{masc} is not invariant in that G.

Lastly a (binary) relation R between expressions is *structurally invariant* iff whenever x bears the relation R to some y then h(x) bears R to h(y), all automorphisms h. For example *has the same category as* is typically but not always invariant. By theorem, *is an* (*immediate*) *constituent of* and *c-commands* are always invariant[3] (which doesn't mean that these relations are useful or enlightening). We expect agreement relations to be invariant – if x agrees with y then h(x) should agree with h(y), all automorphisms h. And we contend on the basis of our models that the anaphor-antecedent relation is universally invariant – an empirical claim as the invariance does not follow from the definition of grammar + invariant.

Of general interest are semantically defined properties and relations, as it makes sense to ask if they are invariant in all grammars, that is, universal. Keenan&Stabler (2003) argue that the property of being *logically true* (true no matter how the world is) is <u>not</u> invariant. For Example (1a) and its negation *It is not the case that* (1a) are not logically true:

(1) a. At least thirty-six and not more than forty-six senators are vegetarians
b. At least forty-six and not more than thirty-six senators are vegetarians

But *thirty-six* and *forty-six* are not syntactically distinct, so the automorphism which transposes *thirty* and *forty* and maps all other lexical items to themselves will interchange (1a,b) and interchange their negations. But (1b) is logically false, so its negation is logically true. (1a) is not logically false and so its negation is not logically true. Thus automorphisms do not preserve logical truth, whence they do not preserve entailment (ϕ *entails* ψ iff ψ is true in every situation in which φ is true), consistent with Chomsky (1986: 205 fn 11). Let us now see how anaphora conditions can vary and yet be universal (invariant in all acceptable grammars for natural languages).

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2. Note that if h(x) has P then $h^{-1}(h(x)) = x$ has P. Thus our definition tells us that P is invariant iff for all expressions x, x has P iff for all automorphisms h, h(x) has P.

3. For all expressions s,t, s is an *immediate constituent* (IC) of t iff for some structure building function F and some expressions $t_1,\ldots,t_n$, $t = F(t_1,\ldots,t_n)$ and for some i, $s = t_i$. s is a *constituent* of t iff either sICt or for some expression u, u is a constituent of t and sICu. s is a *sister* of t iff for some u, sICu and tICu and $s \neq t$. s *c-commands* t if and only if t is a constituent of some sister u of s.

2.2 Semantic definitions of *anaphor* and *R-expression* (Keenan 1989)

We define some semantic notions that apply to predicate-argument structures. We limit ourselves to n-place predicates P_n, for n = 0, 1, and 2, as P_2s provide the minimal environment in which non-trivial anaphora arises. Natural language P_ns contain much semantic structure – they may be stative like *resemble* or activity like *destroy*, arguments may bear different thematic relations to them – Agent, Patient, etc. But all we need for minimal anaphora is the number of arguments a predicate takes. So we will take P_ns to denote n-ary relations over a non-empty domain E (arbitrarily chosen and held constant here). The set of 0-ary relations is just the set {T,F} of truth values.[4] P_1s denote unary relations (subsets of E), and P_2s denote binary relations (subsets of E × E, that is, sets of ordered pairs of elements of E). DPs combine with P_{n+1}s to form P_ns and semantically are functions mapping n+1-ary relations to n-ary ones. Consider first the denotations of DPs combined with P_1s:

(2) a. Some poets daydream
b. All poets daydream
c. Most poets daydream

In (2a) we treat *some poet* as denoting a function SOME POET which maps a set B, such as the set of objects that daydream, to T (true) iff the set POET has a non-empty intersection with B, that is, POET ∩ B ≠ Ø. ALL POET maps DAYDREAM to T iff POET ⊆ DAYDREAM (that is, each x in POET is also in DAYDREAM). And (MOST POET)(DAYDREAM) = T iff POET ∩ DAYDREAM outnumbers POET – DAYDREAM, the set of poets who do not daydream. Note the special case of proper nouns. Classically we think of *John* as denoting an object j in E, noted j ∈ E, and *John daydreams* is true if j ∈ DAYDREAM. To treat *John* as a function mapping P_1 denotations to truth values we interpret *John* as I_j, the *individual* generated by j:

Definition For each b∈E, I_b maps a subset A of E to T (true) iff b∈A.

This is equivalent to the classical view, but now *John* and *some poet* denote functions of the same type so we can interpret *John or some poet* directly.

4. Lest the denotation set for P_0 seem ad hoc we note that in general the denotation set for n-place predicates given a domain E is just $P(E^n)$, the power set of E^n. So an n-place predicate denotes a subset of E^n, that is, a set of sequences of length n of elements of E. Now consider the case with n = 0. E^0 is a set, the set of those sequences of elements of E of length 0. There is only one such, the empty set, ι. So E^0 = {ι} and the power set of E^0 is $P(\{\iota\})$ = {ι,{ι}}, standardly noted {0,1} or, here, {F,T}.

The crucial step is to see how the functions mapping unary relations to truth values extend to ones mapping binary relations (possible P_2 denotations) to P_1 denotations. In fact their values are uniquely determined there. In *John praised every teacher* we know just what set is denoted by *praised every teacher*. It is the set of those b ∈ E which stand in the PRAISE relation to each t ∈ TEACHER. That is, the set of b ∈ E such that (EVERY TEACHER) holds of bPRAISE, the set of things that b praised. In general, for F a function denotable by a subject of a P_1, say ALL(POET), or I_j, etc. the value F assigns to a binary relation R is the set of b such that F(bR) = True. These functions are provably (Keenan 1989) just those that satisfy the *Accusative Extensions Condition* (AEC), (3). Informally it says that if X denotes a function which satisfies it then whenever John praised just the objects that Bill criticized (i.e. jPRAISE = bCRITICIZE) then John praised X and Bill criticized X have the same truth value (both true or both false).

(3) A map F from n+1-ary relations to n-ary ones (n = 1 or 0), satisfies the AEC iff for all a,b ∈ E, all binary relations R,S
if aR = bS then a ∈ F(R) iff b ∈ F(S).

This says that whether F puts an object j in the set it maps a binary relation R to is decided solely by the set of objects that j stands in the relation R to. Such F can be denoted by DPs of arbitrary complexity: *most of John's students, most teachers and between ten and twenty per cent of the students at the meeting*, etc.

Reflexives, like *himself*, do not satisfy the AEC. Suppose that John praised just Bill, Lucy, Sam, Linda, and Roy and that those are just the objects that Sam criticized. Then *John praised himself* is false but *Sam criticized himself* is true. Note that we can interpret *himself* as a function SELF from binary to unary relations: it maps a relation R to the set of objects b such that b stands in the relation R to b:

(4) $SELF(R) =_{def} \{b \mid (b,b) \in R\}$

SELF fails the AEC but satisfies a weaker condition, the *Accusative Anaphor Condition* (AAC), below. This guarantees that if Joe criticized exactly the people he (Joe) adores then *Joe criticized himself* and *Joe adores himself* do have the same truth value.

(5) AAC: For all a in E, all binary relations R,S
if aR = aS then a ∈ F(R) iff a ∈ F(S)

Def 2

1. A DP is an *R-expression* iff it always denotes a function satisfying the AEC
2. A DP is an *anaphor* iff it always denotes a function satisfying the AAC and in some models denotes a function which fails the AEC.

Def 2 is our promised semantic definition of anaphor and R-expression. They are defined in terms of denotations, not syntactic indexing or arbitrary stipulations. Also worth noting is that the complex phrases italicized below are anaphors by this definition:

(6) a. Some student criticized *every student but himself*
b. Bill criticized *both John and himself*
c. No student praised *only himself and the teacher*

The reader may make up a model in which the students John praised are exactly those Bill criticized, but that *John praised every student but himself* and *Bill criticized every student but himself* have different truth values.

3. Anaphora universals over non-isomorphic languages

We exhibit grammars which vary as English, Toba Batak, and Korean do but in which *being an anaphor* and *is a possible antecedent of* are invariant.

3.1 Mini-English (Eng)

Lex

P_1:	laughed, cried, sneezed	P_2:	praised, criticized, interviewed
DP:	John, Bill, Sam, Dan	DP_{refl}:	himself
Conj:	and, or		

Rules

There are two: **PA** (Merge/Move) and **Coord**. (*PA* abbreviates *Predicate Argument* and *Coord* abbreviates *Coordination*). The first line in the **PA** rule says that it combines two expressions, x of category DP and y of category P_1 to form x followed by y, of category P_0 (Sentence). The other lines are understood similarly. Note that the concatenation order varies.

PA

(x, DP)	(y,P_1)	→	$(x^\frown y, P_0)$
(x, DP)	(y,P_2)	→	$(y^\frown x, P_1)$
(x, DP_{refl})	(y,P_2)	→	$(y^\frown x, P_1)$

So a DP concatenates with a P_1 on its right to form a P_0, and with a P_2 on its left to form a P_1. A DP_{refl} like *himself* just concatenates with P_2s, not P_1s. **Eng** does not derive (*himself laughed*, P_0), which is why *himself* and *John* have different categories.

Now the coordination rule (included to ensure Mini-English has infinitely many expressions) has, surprisingly, one interesting property.

First, for all strings x ≠ y and all categories C except Conj,

Coord

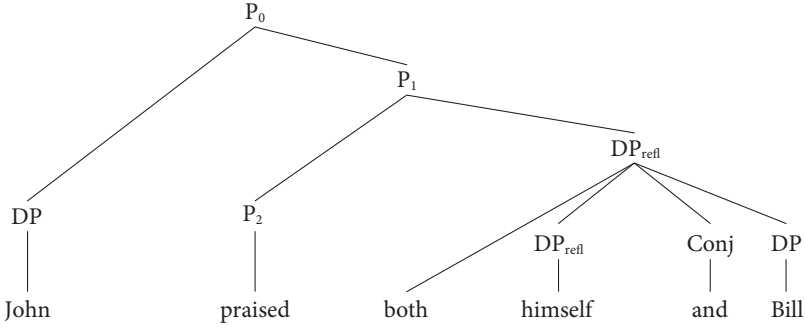
(and,Conj)	(x,C)	(y,C)	→	(both x and y, C)
(or,Conj)	(x,C)	(y,C)	→	(either x or y, C)

Second, for all C ≠ C' ∈ {DP_{refl}, DP}

(and,Conj)	(x,C)	(y,C′)	→	(both x and y, DP_{refl})
(or,Conj)	(x,C)	(y,C′)	→	(either x or y, DP_{refl})

The second condition says we can coordinate *John* with *himself* and the result has the same category as *himself*, namely DP_{refl}. Here is a sample P_0 derived by **Eng**.

(7)



Semantically P_ns and proper nouns are interpreted as already given. *Himself* is interpreted as SELF, defined above. All categories which allow the formation of boolean compounds denote in sets with a boolean lattice structure. So a conjunction of expressions is interpreted as the greatest lower bound of the denotations of the conjuncts; disjunctions as least upper bounds. Specifically given two DPs interpreted by functions F and G, their conjunction denotes (F∧G) understood pointwise: (F∧G)(R) = F(R)∧G(R). Disjunctions are handled dually, denoting (F∨G). Conjunctions and disjunctions of P_0s are interpreted by the standard truth tables for conjunction and disjunction, and conjunctions and disjunctions of P_ns for $n > 0$ are interpreted by intersections and unions. And from Keenan&Stabler (2003) we have:

Theorems on invariants of Eng

1. For all categories C, PH(C), the set of expressions of category C, is invariant.
2. For all x in L(Eng), x is an anaphor iff Cat(x), the category of x, is DP_{refl}. As a corollary to **1.** the property of being an anaphor in L(Eng) is invariant. In addition the set of phrases of category DP_{refl} is infinite (as it includes compounds in *and* and *or* of DPs with DP_{refl}s).

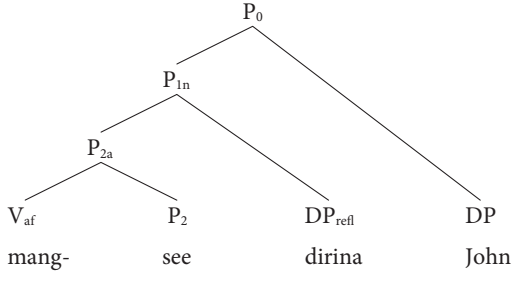
3. The *is a possible antecedent of* relation is invariant, where we define for all x,y,z in L(Eng), x *is a possible antecedent of* y *in* z iff y is an anaphor and for some w in L(Eng) of category P_2, z = PA(x,PA(y,w)).
4. Anaphors are always c-commanded by their antecedents in L(**Eng**).

Theorem 2 says that the (infinitely many) expressions of category DP_{refl} are just those whose denotations satisfy the AAC and, in some models, fail the AEC. It does not *define* anaphors to be expressions of category DP_{refl}. *Anaphor* has already been independently (universally) defined, and the set of phrases of category DP_{refl} is defined by **Eng**.

3.2 Mini-Batak (Batak) (Schachter 1984)

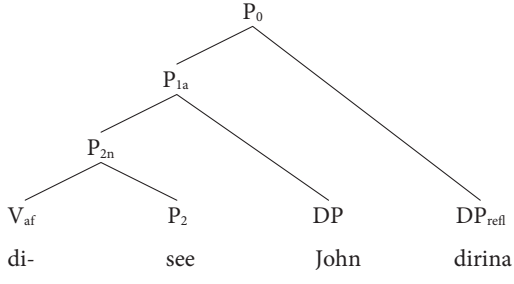
First we illustrate how our mini-grammar builds Ss with anaphors. The trees enable the reader to see what the role of the grammatical categories is and just what the rules do.

(8) a.



John saw himself

b.



John saw himself

The crucial step is that *mang-* and *di-* verbs are *morphologically* distinguished and this distinction is carried through the subcategories of P_ns they build allowing the PA rule to condition the distribution of (non)-reflexive DPs. DPs are not case marked.

Lex

V_{af}: mang-, di	P_2:	praised, saw	P_{1n}: laughed, cried
DP: John, Bill	DP_{refl}:	dirina	Conj: and, or

Rule

There are three: **PA, Coord**, and **VM** (Verb Marking)

VM

(mang-, V_{af})	(s, P_2)	→	(mang⌢s, P_{2a})
(di-, V_{af})	(s, P_2)	→	(di⌢s, P_{2n})

PA

(s,P_{2x})	(t,DP)	→	(s⌢t, P_{1y})	all x ≠ y in {n, a}
(s,P_{1x})	(t,DP)	→	(s⌢t, P_0)	all x in {n, a}
(s,P_{2a})	(t,DP_{refl})	→	(s⌢t,P_{1n})	
(s,$P1_a$)	(t,DP_{refl})	→	(s⌢t,P_0)	

Note that all types of P_1 combine with a plain DP to form a P_0 (Sentence), but only P_{1a}s combine with DP_{refl}s to form a P_0. So P_{1n}s, both lexical and those built with *mang-* verbs and a DP complement, do not combine with a reflexive to form a P_0.

The **Coord** rule coordinates expressions of any category C ≠ V_{af}, Conj, or P_2 yielding expressions of category C.[5] And as in **Eng** it coordinates DPs with DP_{refl}s.

Semantically P_0s, P_{1n}s and P_2s denote 0, 1, and 2-ary relations. The reflexive *dirina* denotes SELF, just like English *himself* and proper nouns denote individuals (I_bs) as before. Full DPs denote functions from n+1-ary relations to n-ary ones, as expected. We call the set of such functions *Type-1*.

What is new here, and what allows us to have anaphors asymmetrically c-commanding their antecedents, is the semantic interpretation of the verbal prefixes. In effect *di-* denotes a converse operator: (DI-F)(x)(y) = F(y)(x).

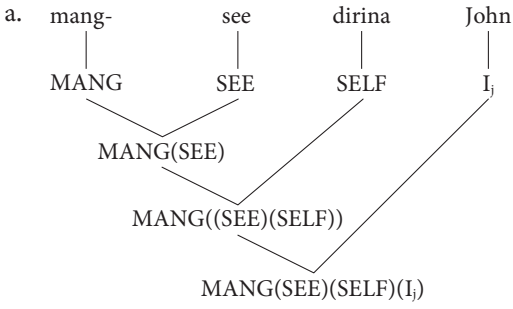
Specifically we define MANG and DI, the denotations of *mang-* and *di-*, as maps from binary relations to maps from Type-1 into the maps from Type-1 into {T,F}:

(9) a. MANG(R)(G)(H) = H(G(R))
b. DI(R)(G)(H) = G(H(R))

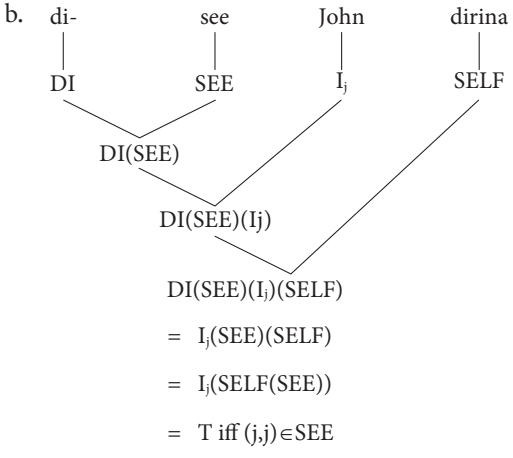
Here is the compositional interpretation of (8a,b):

5. Cole & Hermon (2008) present some new data which would make our mini-grammar somewhat more complicated. Crucially, however, the case of the anaphor c-commanding its antecedent in *di*-verbs remains.

(10) a.



b.



In each case *John* antecedes the reflexive (which c-commands it in (8b)). And again we have as theorems (Keenan&Stabler 2003):

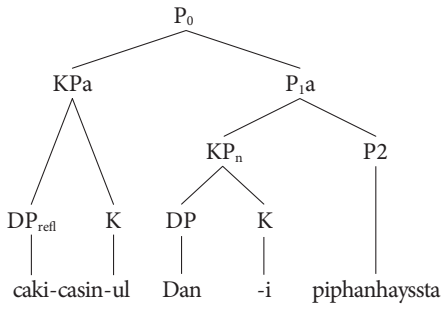
Theorem re Mini-Batak

1. *mang* and *di* (We omit their category coordinate when clear from context) are both lexical invariants (fixed by all the automorphisms of **Batak**). Despite their similarity, no automorphism can map one to the other. (For example, a *mang*-verb + a DP will coordinate with a lexical P_{1n}, like *laughed*. But a *di*-verb + a DP does not coordinate with any lexical item).
   Corollary (8a,b) are not isomorphic in **Batak**: no automorphism maps one to the other, even though their trees are isomorphic.
2. For all categories C, the set PH(C) of phrases of category C is invariant.
3. An expression d in L(**Batak**) is an anaphor iff Cat(d) = DP_{refl}. PH(DP_{refl}) is infinite.
4. The relation *is a possible antecedent of* is invariant, where we define x *is a possible antecedent of* y *in* z iff Cat(x) = DP, Cat(y) = DP_{refl}, and z = PA(PA(u,y),x) or z = PA(PA(u,x),y).

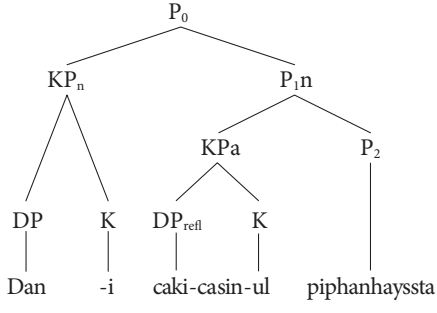
3.3 Mini-Korean (Kor) (Park 1986)

Case marking in Korean is *dual* to voice marking in Batak. The distinctive morphology is now on the DPs, not the predicates. Compare:

(11) a.



b.



Lex

DP: Dan, John, Sam DP_{refl}: caki-casin K: -i, -ul

P_{1n}: laughed, cried P_2: praised, criticized Conj: and, or

Rules

There are three: **PA, Coord**, and **CM** (Case Marking)

CM

(-nom, K) (t,DP) → (t-nom, KP_n)

(-acc, K) (t,C) → (t-acc, KPa) all $C \in \{DP, DP_{refl}\}$

PA

(s,KP_x) (t,P_{1x}) → (s⌢t, P_0) all $x \in \{n,a\}$

(s,KP_x) (t,P_2) → (s⌢t, P_{1y}) all $x \neq y \in \{n,a\}$

As before we can coordinate expressions of category C yielding expressions of category C, for C = DP, DP_{refl}, P_0, P_{1n}, P_{1a}, P_2. And DPs coordinate with DP_{refl}s.

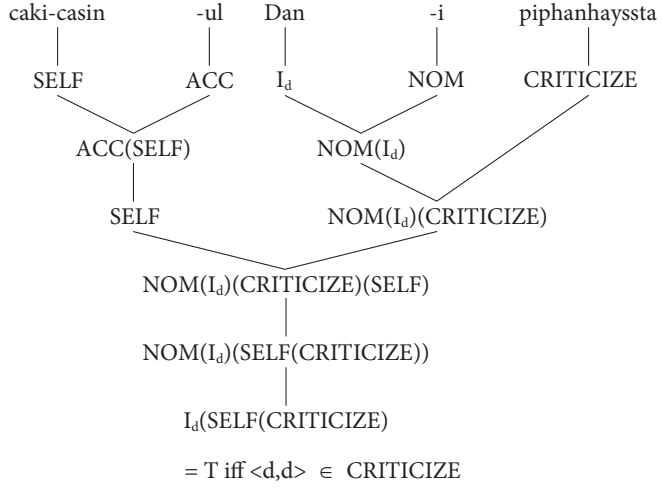
The syntax of **Kor** is, by now, straightforward and its interpretation is quite similar to that for **Batak**. P_0s, P_{1n}s and P_2s are interpreted as 0-ary, unary, and binary relations. Lexical DPs denote individuals I_b and the lexical DP_{refl}, *caki-casin* denotes SELF, like English *himself* and Batak *dirina*. The novelties are the interpretations

of the case markers (*i*, K) and (-*ul*, K). In fact (-*ul*,K), like MANG, denotes the identity function. (n arguments can be distinguished by n – 1 case markers, and **Kor** predicates have at most two arguments). (*i*, K) is interpreted as that function NOM which is the identity on P_{1n} denotations, but behaves like **Batak** DI on P_2s:

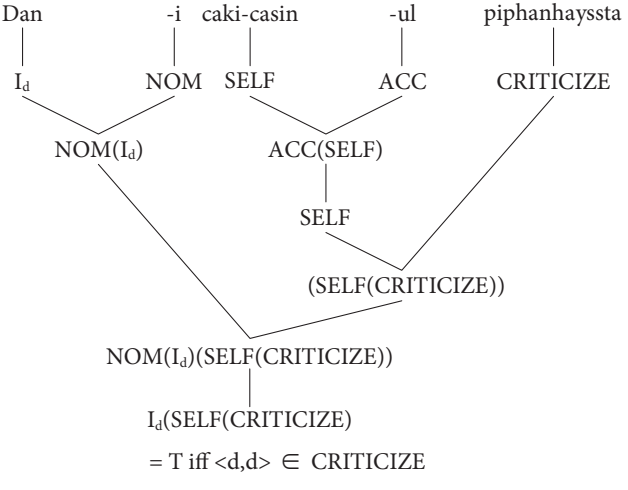
(12) For F a Type-1 function, NOM(F) maps a binary relation R to that function which maps each Type-1 function G to F(G(R)).

We illustrate the compositional interpretation of (11a,b):

(13) a.



b.



Theorems re Kor

1. The case markers (*-i*, K) and (*-ul*, K) are invariant, so no automorphism can map either case marker to the other. Further, no automorphism maps either of (11a,b) to the other, despite their isomorphic tree representations.
2. For each category C, PH(C) is invariant. The anaphors are just PH(DP_{refl}), so the property of being an anaphor is invariant.
3. The *is a possible antecedent of* relation is invariant, where we define:

   x *is a possible antecedent of* y *in* z iff x has category DP, y has category DP_{refl}, and z = PA(x, PA(y,w)) or z = PA((y, PA(x,w))), some w of category P_2.

3.4 Conclusion

Our results are consistent with the claim that the anaphor-antecedent relation and the property of being an anaphor are universally invariant though grammars for different languages may not be structurally the same at any "level of structure". In particular nuclear clauses with reflexives in English, Batak, and Korean are pairwise non-isomorphic (using our very simplified models). Nonetheless they are invariant in all cases. That is, in all cases we can compute syntactically whether an expressions α is an anaphor or not and whether some other expression β is a possible antecedent for it. Thus we establish the relation between sound and meaning that syntax is held to do (Hauser, Chomsky, Fitch: 2002).

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Appendix

Voice and case conditioned anaphora Tagalog conditions the distribution of anaphors using both verbal and nominal morphology. Contrast (14a), formed by infixing the root *sampal* with *-in-* and (14b), which infixes *-um-*:

(14) a. S*in*ampal ng guro ang estudyante
praised teacher student
The teacher slapped the student
b. S*um*ampal ng estudyante ang guro
praised student teacher
The teacher slapped the student

The postverbal order of the full DPs *ng guro* and *ang estudyante* in (14a) is fairly free (Schachter and Otanes 1972: 83, Kroeger 1993: 110), very unlike postverbal order in Toba Batak. But if we merely interchange *ng* and *ang* in (14a) without changing the verbal infixes *-in-* and *-um-*, we change the meaning to *The student slapped the teacher* (similarly for (14b)). Comparable to external DPs in Toba Batak, only *ang* DPs can be relativized. Constraints on the distribution of reflexives are comparable to those in Korean and Toba, the crucial cases being (15a,b).

(15) a. Sinampal ng bawat guro ang kanila+ng sarili
slapped all teacher 3.PL.GEN+LNKR self
All the teachers slapped themselves
b. *Sinampal ang bawat guro ng kanila+ng sarili
slapped all teacher 3.PL.GEN+LNKR self
All the teachers slapped themselves

Interchanging the prenominal case markers in (15a) is strongly ungrammatical, (15b). So verbal morphology conditions the interpretation of case marked arguments and the distribution of anaphors and so is an integral part of syntactic and semantic structure.

CHAPTER 3

Elements of syntax

Repulsion and attraction

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Tilburg University, The Netherlands

This contribution presents a somewhat autobiographical overview of the author's struggle in coming to grips with the undeniable central role that the forces of attraction and repulsion play in the grammar of natural languages. It is therefore a tale of good and bad ideas, where the bad ideas sometimes suppressed the good ones. After disentangling these previous attempts at a more or less comprehensive theory of repulsion and attraction, I present a sketchy research program for where I think we need to go to find a satisfactory solution.

> It is [the] disposition of attractive force in all bodies,
> whatever their form or composition, to run together,
> coalesce, centralize, and become accumulative into a single
> volume to any extent or degree. […] These facts lie at the basis
> of Newton's universal law. Immediately opposed to this force
> appears another of equal magnitude and importance,
> which has heretofore been ignored by physicists,
> but which as certainly exists, and plays as
> important a role in nature as gravitation itself.
> This is repulsion.
> (Winslow 1869: 75)

https://doi.org/10.1075/lfab.15.03rie

1. Early sources of inspiration[1]

As a first year student interested in linguistics in Paris in 1967, I had read André Martinet's Éléments de linguistique (Martinet 1960).[2] That was what made me decide to attend Martinet's classes on diachronic phonology. One of the central concepts that he discussed was the idea that sounds changes are often chain reactions. A vowel, say [ɑ], may shift to become [e]. But if the system already has an [e] in it, that [e] is likely to shift further up in the phonetic triangle and become [i] to create room for the original [ɑ]. This type of chain he called a 'push chain'. In another scenario, however, some slot in the triangle, e.g. that of [i] might be unused in some language. In that case [e] might shift upward to become [i], leaving a void in the [e] position. As a result [ɑ] might then raise to become [e]. This is what Martinet called a 'drag chain'. See Samuels (2009) for insightful discussion of Martinet's views.

Martinet's push chains and drag chains principle was thought to apply both to syntax and to phonology. It was a source of inspiration to me since 1967 (see for example Van Riemsdijk 1997, 1998). More generally, it has always been my conviction that if there are some very general principles of design that co-determine the structure and functioning of syntax, it would be very strange to find that such principles are completely absent in phonology and vice versa. The fundamental formal similarity between phonology and syntax was one of the core insights of the late Jean-Roger Vergnaud's work which has inspired me since the mid seventies.

My purpose in this article is to sketch a bit more of the background of these abstract ideas and to illustrate how they manifested themselves in a number of interesting and inspiring proposals over the years. This is the goal of Section 2. In Section 3. I draw from these ideas some major guidelines for a theory of syntactic categories and representations. Finally, in Section 4. I will sketch some very immature and programmatic ideas as to how a theory of the type outlined in Section 3. might be implemented.

---

1. For more recent inspiration and feedback I wish to thank audiences at the following occasions where I presented various aspects and versions of the present work: Josef Bayer's Birthday Workshop, Konstanz November 2010; the Parallel Domains Conference in Honor of Jean-Roger Vergnaud, USC, Los Angeles, May 2011; the conference on New Perspectives on Language Creativity at UQAM, Montreal, September 2011, the City University of Hong Kong, October 2011; the Joint Symposium on the Interfaces of Grammar, Chinese Academy of Science, October 2011; and the Faculty of Foreign Languages and Literatures of the University of Bucharest, May 2013. I dedicate this article to the memory of Jean-Roger Vergnaud.

2. The two other works I had read at that time were Louis Hjelmslev's *Omkring sprogteoriens grundlaeggelse* (Hjelmslev 1943, 1953) and Pike's *Language in relation to a unified theory of the structure of human behavior* (Pike 1967). I still had to discover the existence of generative grammar.

2. A bit of "early" history

In the late seventies, Longobardi, following up on Ross' inspirational work on the exclusion of sequences of two verbs carrying the *ing-* suffix in English (1972b) discovered that sequences of two bare infinitives in Italian are excluded unless they have undergone restructuring (making them in a sense a single complex verb), see Longobardi (1980). Generalizing, this amounted to a principle that excludes two independent verbs in close proximity. On the one hand, infinitive markers suffice to separate the two verbs sufficiently to make them survive the restriction. On the other hand, restructuring makes them so close that the restriction does not apply either. Using our metaphor, we may say that the configuration VV is unstable and cannot survive unless either repulsion (such as by the intervening infinitive marker) or attraction (such as in restructuring) saves the configuration. In addition the relative morphological identity (*-ing* form, infinitive from) plays an important role. We may summarize these results as

(1) $*V_{Fi}V_{Fi}$ (where F_i stands for some inflectional feature(s))

Van Riemsdijk (1984) showed that the same principle is at work in the distribution of infinitives in German.

Around the same time, comparable considerations were found to apply in the domain of nouns. In a letter commenting on Chomsky and Lasnik's 'Filters and Control' (Chomsky & Lasnik 1977), Jean-Roger Vergnaud proposed the Case Filter (1977, Vergnaud 2008). This filter stated, among other applications, that noun phrases that fail to be assigned (abstract) case cannot survive in a derivation. This was effectively the birth of Case Theory. One of the core instances where this filter was supposed to apply is the absence of noun phrase complements to nouns, due to the absence of structural case assigned to such complements (*of* or some other preposition) makes up for the absence of structural case. This idea can be summarized as (2):

(2) *N-NP

Clearly, (1) and (2) have more in common than a superficial glance suggests. Indeed, in (1) one of the infinitives is part of a verbal projection. Hence, another way of stating the two principles would be this:

(3) $*V - V^{max}$ and $*N - N^{max}$

Put this way, the two principles cry out for a generalization. In a GLOW talk in the early 80s, Kayne indeed made a proposal along these lines (Kayne 1982). Kayne's proposal, which was based on the idea of syntactic structure being fundamentally a continuous alternation of predicates (verbal elements) and arguments (nominal elements), was never written up beyond the GLOW abstract.

Two years later, however, Hoekstra did follow up, abandoning the predicate-argument alternation and extending instead the observations about N and V to the two remaining categories A and P (cf. Hoekstra 1984). In effect, Hoekstra proposed what he called the Unlike Category Constraint (UCC).[3]

(4) The Unlike Category Constraint (UCC): *VV, *NN, *AA, *PP

While such a generalization seems tantalizingly interesting, it fails on a number of points. As I argued in Van Riemsdijk (1988), the UCC is both too strong and too weak. Before presenting a rough overview of the relevant evidence, it must be noted that we are, at least for the present, limiting ourselves to cases of the (in-) compatibility between a head and a phrasal complement to that head. Furthermore, the question arises as to how we treat functional projections from this perspective. Anticipating the discussion further below, I will assume, following Emonds (1985), that CP has essentially the same categorial status as PP. I will also assume that functional projections above the lexical heads N, V, A are categorially identical (modulo a feature that distinguishes lexical from functional heads, see Grimshaw (1991, 2005), Van Riemsdijk (1990, 1998)).

With this in mind, let us briefly consider the predictions of the UCC.[4] In addition to *VV and *NN, which we have already mentioned above, what about *A-AP and *P-PP? *A-AP seems perfectly correct in the sense that adjectives do not appear to select AP-complements. On the other hand, it is far from clear that *P-PP is warranted. While most recent work on the structure of PPs assumes that there are functional head positions for both Place and Path, there are are other cases that do not fit into such a structure. To cite just one example, take a Dutch sentence like (5).

(5) a. *Voor bij het dessert serveren we een Château d'Yquem*
for with the dessert serve we a Château d'Yquem
'We will serve a Château d'Yquem to accompany dessert'
b. *Tips voor naar de trimsalon*[5]
tips for to the pet-grooming-salon
'Advice for [going to] the pet salon'

These examples suggest that the preposition 'voor' selects complete PPs as complements. Therefore the UCC is too strong in that it should not exclude *P-PP.

On the other hand, the UCC is too weak in that it fails to exclude a fair number of combinations. In particular, it does not prevent V and N from taking a (bare) AP complement. While V can take a small clause with an AP predicate, it is not

3. In the formulation of (4) the projection level is, again, ignored.

4. For more discussion, see Van Riemsdijk (1988).

5. Found on: http://www.debbystrimhut.nl/pages/sub/54311/Tips_voor_naar_de_trimsalon.html

particularly plausible to assume that the small clause is an AP. N cannot even take such a small clause.

These considerations led me to suggest a different way of looking at the overall situation. Hoekstra's proposal takes syntactic categories to be atomic. But since Chomsky (1970) there has been a simple way of decomposing syntactic categories in terms of the features [±N] and [±V].[6] These features determine the four major categories as follows.

(6) N = [+N, −V]; V = [−N,+V]; A = [+N,+V]; P = [−N,−V]

One way of summarizing the discussion of the UCC above is to say that AP is the most restricted category in that it basically hardly ever occurs as a complement to a lexical head.[7] On the other hand, PP seems to be the most versatile category in that it can be a complement to all of the four major categories and in turn can select a maximal projection of each of the four major categories. What this suggests is that it is not the atomic categories but the plus values of Chomsky's categorial features that are relevant. Accordingly, in my 1988 paper (see Van Riemsdijk 1988) I proposed to replace the UCC by the Unlike Feature Constraint (UFC).[8]

(7) **The Unlike Feature Constraint (UFC):** $*[+F_i]^\circ - [+F_i]^{max}$
where F_i = N or V

This formulation permits a fairly close approximation of what I believe we want to say. Systematically:[9]

(8) a. Excluded by $*[+V]^\circ$-$[+V]^{max}$: $V^\circ - V^{max}$ and $V^\circ - A^{max}$
$A^\circ - V^{max}$ and $A^\circ - A^{max}$

b. Excluded by $*[+N]^\circ$-$[+N]^{max}$: $N^\circ - N^{max}$ and $N^\circ - A^{max}$
$A^\circ - N^{max}$ and $A^\circ - A^{max}$

c. Versatility of P: $\sqrt{P^\circ - N^{max}}$; $\sqrt{P^\circ - A^{max}}$; $\sqrt{P^\circ - V^{max}}$; $\sqrt{P^\circ - P^{max}}$
$\sqrt{N^\circ - P^{max}}$; $\sqrt{A^\circ - P^{max}}$, $\sqrt{V^\circ - P^{max}}$; $\sqrt{P^\circ - P^{max}}$

d. Also permitted: $\sqrt{V^\circ - N^{max}}$; $\sqrt{N^\circ - V^{max}}$

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6. For some discussion of these features, see Jackendoff (1977), Van Riemsdijk (1978) and Muysken and Van Riemsdijk (1986).

7. For reasons that will become clear below I will assume that P does take AP complements in cases like *The weather changed from pleasant to foggy*.

8. In the formulation of the UFC, as in the (sub-)principles and generalizations above no strict ordering is implied.

9. The systematic way of representing the predictions in (8) implies some redundancies that are not, of course, present in (7).

The fact that it is the positive values of the categorial features and not the negative ones suggests immediately that the features should be (re-)interpreted in a privative, monovalued way. This is indeed what I concluded in the 1988 paper. And I was inspired by work in autosegmental phonology and more particularly by Jean-Roger Vergnaud's work.

In seminal work in the late seventies, Vergnaud proposed to treat the 'categorial features of phonological structure,' that is, features such as consonantal and vocalic as autosegments (see Vergnaud 1976, 1980). The idea was, put very simply, to have exactly those elements represented on a separate tier that play a crucial role in certain phonological process. Vowel harmony, as the name suggests, is a process that affects vowels and disregards consonants. This way of thinking about phonological structure presupposes that phonological features are interpreted as mono-valued, privative, in other words not as binary, equipollent features as conceived in early generative phonology.[10]

Having switched our attention briefly to phonology, note that there is an important principle in phonology called the Obligatory Contour Principle (OCP, see McCarthy (1986) and references cited there). The OCP does in phonology what the principles discussed above try to do for syntax, viz. regulate attraction and repulsion. Indeed, the essence of the OCP is often rendered as the constraint *XX, where X stands for some phonological feature or feature bundle. To exemplify, two adjacent short vowels that are identical, say [e e], cannot survive by the OCP. They either fuse to the single long vowel [ē], or one of the two short vowels is deleted, yielding [e], or dissimilation applies, yielding, for example, [i e], or epenthesis inserts some element between the two identical vowels: [eʔe].

The fact that there is such a clear conceptual similarity between the OCP in phonology and a principle such as the UFC in syntax reinforces the idea that we should pursue the possibilities of (largely) identifying the formal apparatus used to express them in syntax and phonology. Thus the inspirational influence of Martinet's push chains and drag chains, married to Vergnaud's formal work on models that encompass phonological and syntactic structure continued to guide my work.[11]

The highly simplified representation of vowels and consonants that I based my suggestions in Van Riemsdijk (1988) on amounted to saying that there is a vowel tier and a consonant tier, and that vowels are segments that are linked to the V-tier while consonants are segments (x) linked to the C-tier:

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10. This way of thinking about phonological categories has become a cornerstone of so-called government phonology (see Kaye, Lowenstamm & Vergnaud 1985, 1990). An attempt to apply similar reasoning to syntax was presented in Van Riemsdijk (1982).

11. For an important more recent study along these lines, see Vergnaud (2003).

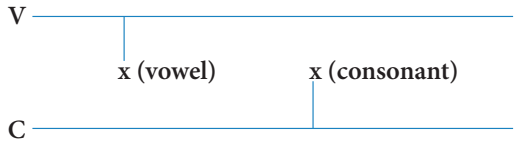

Figure 1.

This way of representing phonological segments permits a very simple way of stating the OCP: two adjacent segments that are linked to the same tier.

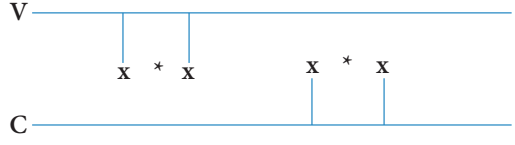

Figure 2.

This seemed to me to be a promising direction to take for a theory of syntactic categories, and in the 1988 paper I made some very preliminary suggestions as to how one might proceed from here. Then, however I temporarily dropped this line of research in favor of other research topics. And it took me ten years to return to the problem of finding a good representational system for syntactic categories. The results, which I turn to in the next section, are published in Van Riemsdijk (1998).

3. Some ideas about categories, projections, the internal cohesion of projections, and the contexts in which they occur

Let us be a bit more specific as to what fundamental insights we want a theory of syntactic categories to express. What we have looked at so far is the relationship between heads and the complements that they select. And our conclusion was that this relationship is characterized by the UFC, a type of OCP that forces the positive values of the syntactic features to be different – a case of repulsion. If we think of the complements as (extended) maximal projections, then one way to look at this is to say that in a complex syntactic tree, full of nodes with categorially labelled nodes it is hard to know where one maximal projection ends and where another starts. In other words, how are phrases recognizable and delimitable within larger syntactic configurations. The UFC provides at least a partial answer to this question.

This reasoning rests on one crucial assumption, viz. that the spine of an (extended) maximal projection does not contain any categorial transitions that could

be (mis-) interpreted as the start of a new extended maximal projection. This is an idea that has come to be known as the Categorial Identity Thesis (CIT), proposed independently in work by Grimshaw (1991, 2005) and Van Riemsdijk (1990, 1998). Since the introduction of functional shells around the projection of lexical heads, a core question that needed to be answered was how the notion of endocentricity, once central to X-bar theory, should be interpreted. If every functional projection is a head *sui generis* with its own maximal projection, then what we originally wanted to express is not longer expressed. The idea that a noun phrase is headed by a noun, while still encoded in the structure, has become almost meaningless in that there are potentially so many functional heads above it (NumP, ClassP, QP, DP etc.) that endocentricity becomes a virtually empty notion. Instead, we want to make a much stronger statement: a noun phrase with all its functional projections around (or on top of) it always has a lexical N in it. Similarly for V, A, and P. That is, there is a one-to-one relationship between N and DP (assuming that DP is the outermost functional shell of the noun phrase); and there is a one-to-one relationship between a V and its outermost functional shell, say, the IP or CP; and so on and so forth. What this amounts to is that there can be more than one head in a single extended projection, but that the privileged one-to-one relationship still holds between the lexical head N, V, A, P and its respective maximally extended projection.

If this is the right way of looking at things, then we will want to avoid stipulating which functional heads/projections belong with which lexical head. Yet it seems clear that these are privileged relationships as well. Verbs have tense, aspect, mood, modality and presumably quite a few other functional shells around them, while nouns have determiners, quantifiers etc. In many cases functional heads cannot be easily associated to some categorial notion. Negation, for example English *not*, is not in any obvious way a verb or a noun. But in many cases, such an attribution is possible. Articles (determiners), for example, are very often similar, or even identical, to (clitic) pronouns. Similarly, modality, when expressed as part of the verbal projection, shows up as modal verbs, not as modal nouns in, again, English and many other Indo-European languages.

This, then, is the core of the Categorial Identity Thesis (CIT): the spine of a maximally extended projection is characterized by the fact that all functional heads of some lexical head L and their functional projections all the way up to the top share the same categorial specification in terms of the values for [N] and [V].[12] We thereby have a counterpart of the UFC idea: the internal cohesion of a

12. An interesting question that arises from this is whether intermediate functional heads truly need their own maximal projection nodes. To the extent that they do not seem to act as privileged nodes (they generally cannot move inside or out of their maximally extended projection),

maximal projection is formally expressed in terms of the CIT. And for cohesion, we can substitute the notion of 'attraction' in line with the major metaphor guiding this line of thinking.[13]

The idea of categorial identity as one of the core organizational principles determining the internal structure of (maximal) phrase needs to be translated into the framework built on categorial features. In other words, is it plausible to abandon the notion of binary features in favor of monovalued, privative features in the case of the CIT as well? It would seem that the answer is yes. The main prediction of such a monovalued system will be, again, that P/PP is the most versatile category in that P does not affect the CIT when interspersed with the features N or V. Take the fact that infinitive markers are often morphologically identical with prepositions. Nevertheless, these infinitive markers do not turn an infinitival complement into PPs. Or take nominal projections. As I argued in Van Riemsdijk (1998), container expressions such as *a glass of wine* are really mono-projectional in that it is the lexical head *wine* that is selected by a governing verb, as in *John drank a glass of wine*. Lexical prepositions on the other hand do block selection of the lower head as in **John drank a glass with/for wine*. Indeed closely related languages such as German omit the preposition, and furthermore, the lower head (and its modifiers) express the case required by the governing head. The preposition *mit* ('with') requires the dative case, hence we get *mit einem*$_{DAT}$ *Glas rotem*$_{DAT}$ *Wein* ('with a glass of red wine').[14]

The CIT can be formulated as follows.[15]

(9) **The Categorial Identity Thesis (CIT)**: In a structure like the one in Figure 3, all nodes H/h must be identically specified for the values of the features N and V.

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it would seem that we do not need them, thereby further strengthening the endocentricity of maximal phrase: one lexical head, one maximal phrase node. This is the line that I defended in Van Riemsdijk (1998). I will not pursue this issue here.

13. Note that my 1998 article was entitled 'Categorial Feature Magnetism' – another attempt at finding an expressive metaphor from the physical world for the fundamental forces determining the categorial configurations in complex syntactic objects.

14. See Van Riemsdijk (1998) for more extensive discussion. In particular, the question arises as to what status we should assign to the first (container) noun in such expressions. I proposed to introduce the notion of semi-lexical category for such cases. See also Corver and Van Riemsdijk (2001) for discussion.

15. In Figure 3 I employ a convention I proposed in Van Riemsdijk (1990) in that I use upper case letters for lexical head and lower case letters for functional (and semi-lexical) head.

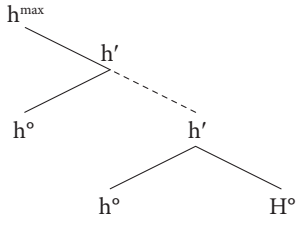

Figure 3.

The two major principles, UFC and CIT, taken as grammatical reflections of repulsion and attraction, are principles that cry out for unification. But before addressing that problem, three more important aspects of categorial representation must be addressed: the distribution of lexical, semi-lexical and functional categories within a maximal projection, the status of CP and PP, and the problem of mixed categories.

Starting with the latter, gerunds are a typical example of a mixed category. They are nominal on the outside and verbal on the inside. Clearly, this state of affairs is in flagrant contradiction with the CIT unless we say that gerunds consist of two maximal projections, which appears to be wrong.

Turning now to the second problem, the distribution of lexical, semi-lexical and functional categories within a maximal projection, the generalization appears to be that the lexical head is at the bottom, the functional categories are at the top, and the semi-lexical categories are in between. There does not seem to be any alternative to adding this as a separate stipulation to the theory.

Consider finally the status of CP and PP. It has been argued that CP is really categorially identical to PP (cf. Emonds 1985). The idea could be that CP is the outermost functional shell of the V-projection, while at least a subset of PPs, prepositional objects, are really N-projections within a PP shell. This would be compatible with the formulation of the CIT, as P (or p) is not categorially specified for either N or V. However, nothing predicts that the PP must be the outer shell.

With these problems in mind, let us now turn to my next attempt to come to grips with what I consider to be the fundamentals of categorial structure in syntax, the article called 'Categorial Feature Magnetism' (Van Riemsdijk 1998).

4. A monumental mistake

When, in the second half of the nineties, I returned to the issue of finding a system of representation that would incompass the main properties of syntactic categories as I saw them, I made a serious mistake. In fact, I abandoned the idea of monovalued

categorial features (or perhaps I just forgot about it) and attempted to develop a theory in terms of binary features. Nevertheless, the article contained some useful empirical underpinnings of the notions that guide the search for a good system of categorial representation, which is what it is mostly cited for. On the theoretical side it was ambitious and misguided. I use this opportunity, however, to give a brief explanation for what I tried to achieve and why I did it with binary features.

The core idea was to take two of the problems mentioned at the end of Section 3, viz. the problem of PP/CP shells and the problem of lexical heads being innermost, semi-lexical heads intermediate, and functional categories outermost, and to combine them with the UFC and the CIT into one system. The way this was done was to add two additional types of features to the two categorial features [±N] and [±V]. First, the distinction between lexical, semi-lexical and functional categories was expressed by means of the two features [±F(unctional)] and [±G(rammatical)]. Call these the functionality features.[16] Second, the levels in a projection could be distinguished by means of the two level features that Muysken (1983) had proposed earlier, [±PROJ(ection)] and [±MAX(imal)]. These features yield the following distinctions:

(10) ***L*-features**:
[+PROJ, +MAX] = maximal projection node (H^{max})
[+PROJ, −MAX] = intermediate node (H′)
[−PROJ, −MAX] = head (H°)
([−PROJ, +MAX] = unprojected particles ($[\ H^{\circ}\ ]_{H}^{max}$))

(11) ***F*-features**:
[+F, +G] = functional category
[+F,−G] or [−F, +G] = semi-lexical category[17]
[−F, −G] = lexical category

Take the level features first. One way guaranteeing that only structures like the one given in Figure 3 are allowed is to say that in a projection the minus value of one of the features may never dominate the plus value of that feature. In the normal case (forgetting about unprojected particles), the lexical head will be [−PROJ, −MAX], all intermediate nodes are [+PROJ, −MAX], the maximal projection node is [+PROJ, +MAX].

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16. Grimshaw (2005) uses an F-feature as well, but in a somewhat different way. It is a termary feature that distinguishes lexical from functional (these are the F-values F0 and F1). F3 is used to designate the PP-shell above N/D and the CP-shell above V/I.

17. Whether there is any grounds for choosing between [+F, −G] and [−F, +G], or whether there is a distinction that might be traced to these two options (as in the case of [−PROJ, +MAX]) remains an open question.

Similarly, to express that lexical is at the bottom, semi-lexical is above lexical, and functional is at the top, we can say that the minus value of one of the features ([±F] and [±G]) may never dominate the plus value of that feature. The two principles can then be subsumed under what I called the No Value Reversal Condition.

(12) **No Value Reversal 1 (NVR1)**:
Within a single projection, the following holds:

$*[-F_i]$ where F_i ranges over PROJ, MAX, F, G

|

$[+F_i]$

Let us turn now to the issue of PP being, at least in the cases of prepositional objects, a functional shell above N/D, while CP could be interpreted as a functional shell above V/I.[18] Looking again at the categorial features as binary features, we may say that full identity of these feature specifications in a projection is not required, but that, going from the bottom to the top an N-projection may turn into a P-projection, and a V-projection may also turn into a P-projection. This would imply an inverse version of the No Value Reversal Condition:

(13) **No Value Reversal 2 (NVR2):**
Within a single projection, the following holds:

$*\ [+F_i]$ where F_i ranges over N,V

|

$[-F_i]$

It is easy to see that the two principles in (12) and (13) could be collapsed if we were to change some features. For example, we might replace Muysken's level features by [±HEAD] and [±MIN(imal)], and the functionality features by [±LEX(ical)] and [±OPEN (class)].[19] This would reverse the feature specifications.

However, even this relatively simple case should teach us one thing: it is too easy to change the names of the features, and thereby manipulate what is a plus value and what is a minus value. And the same criticism applies to my attempt at 'unifying' the CIT and the UFC. To cut a long and arduous story short, this is the result of my labors, grandiosely called the Law of Categorial Feature Magnetism.

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18. See also Grimshaw (2005), Haider (1988), and Van Riemsdijk (1990).

19. Lexical heads = [+LEX, +OPEN], semi-lexical categories = [+LEX, –OPEN], functional categories = [–LEX, –OPEN]; Lexical heads = [+HEAD, +MIN], intermediate projections = [–HEAD, +MIN], maximal projections = [–HEAD, –MIN]. The No Value Reversal Condition Revised (NVR3) would be like NVR2, with F_i ranging over N, V, LEX, OPEN, HEAD, MIN.

(14) **Law of Categorial Feature Magnetism** (cf. Van Riemsdijk 1998: (97) p. 46)

A configuration

$[\alpha N, \beta V]_C \cup Li$ (where α, β, γ, δ range over + and −,

| [+PROJ] ⊂ Li, and [±PROJ,±MAX] ⊆ Lj)

$[\gamma N, \delta V]_C \cup Lj$

is illicit (*) unless: (i) at most one of α, β, γ, δ is '+'

or (ii) $[-MAX] \subset L_j$ and α=γ and β=δ

or (iii) $[+MAX] \subset L_j$ and α≠γ and β≠δ

At this point I am, quite frankly, unsure whether this formulation ever expressed what I wanted it to express. But what is more important, it never was a unification as it contains several disjunctions. Furthermore, as noted above, the use that is made of plus and minus values of C-, F-, and L-features is quite artificial and stipulative.[20] My conclusion from this adventure is that it is now, 25 years after the appearance of Van Riemsdijk (1988), high time to return to the idea that the issue of developing a valid theory of categorial representation should be rethought in terms of monovalued features and the OCP. In the next and last sections, I will suggest some very preliminary ideas as to how one might go about such a research program.

5. First ideas about a new approach

In what follows I will present a very tentative sketch of how we might put a little bit of flesh on the bare bone that was presented in Van Riemsdijk (1988). Much of it will be wrong or misguided or redundant. My goal is modest: to explore some of the directions that a theory of categorial representation might go.

There are, now, several phonological theories that work with mono-valued, privative features. The main ones are Dependency Phonology (Anderson & Ewen 1987), Particle Phonology (Schane 1984), and Element Theory, which is one of the core components of Government Phonology (Kaye et al. 1985; Kaye et al. 1990; Harris 1994; Harris & Lindsey 1995). I have chosen to adopt the term ELEMENT THEORY, mainly because Particle Phonology appears to me to be conceptually inferior and because Element Theory seems closer to the ideas developed in my (1988) paper and offers an easy way of representing things. My borrowing from Element Theory is, in any case, quite minimal, leaving aside (for now) notions such as headedness and government.

20. To be quite honest, I am in retrospect somewhat surprised that the 1998 article was ever accepted for publication in a major journal.

As a starting point, let us assume that there is a Categorial Tier, on which the values N and V are displayed in the form of a template: N V N V N V. A template like this is very much like the standard template C V C V C V in phonology, i.e. it incorporates ideally the avoidance of identity (*XX) as the core idea of the OCP (Yip 1998; Van Riemsdijk 2008; Richards 2010). This will be the cornerstone for an account of the UFC.

Similarly, we will use a second tier to represent the Level features. Deviating somewhat from Muysken's (1983) level features [±PROJ, ±MAX], the three major levels: head, intermediate and maximal will be represented by means of the features H(ead) and M(aximal). These features will also be displayed on the Level Tier in the form of a template: H M H M H M.

There are slots that I will represent as 'x' that can be linked both to the Categorial Tier and to the Level Tier. These slots we may call the complete syntactic units. These correspond to the notion of syntactic phrase. The resulting graphs represent at least some of the core insights summarized in Section 2. In addition, in order not to stray too far from the notion syntactic tree, I will represent heads as separate (dotted) slots that are on the one hand linked to the Level Tier and on the other hand to what I call the Merge Tier which is, in essence, the spine of the (dendromorphic) projection as we know it.

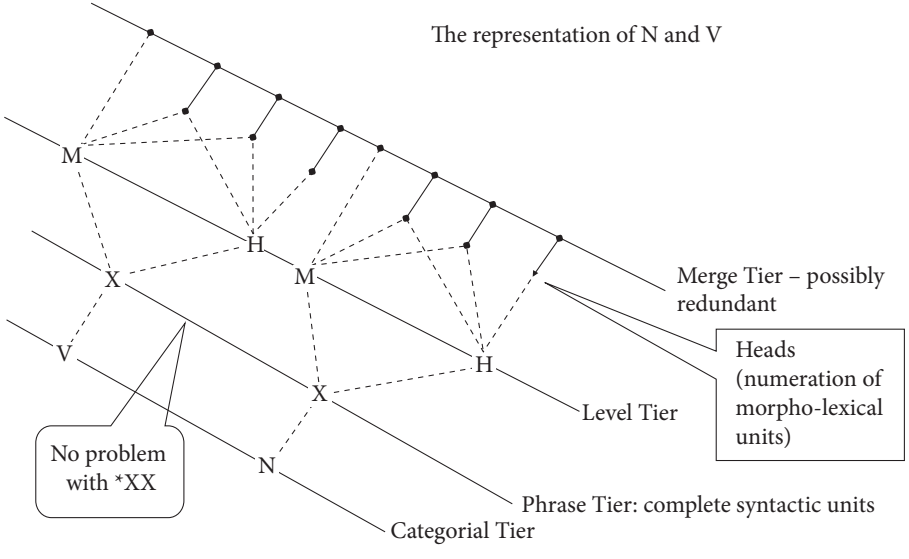

Figure 4.

The intermediate head nodes in the syntactic tree are variably linked with M and or H. This at least partly solves the problem of [±F,±G], necessitated by the introduction of semi-lexical heads, which implied that the [±F] feature was insufficient. A

node uniquely dominated by H is the lexical head, a node uniquely dominated by M is the maximal (extended) projection node. Intermediate nodes are all dominated by H, hence are heads. Those that are in addition dominated by M are functional heads or semi-lexical heads. However, the functional – semi-lexical gradient is only contextually defined: those intermediate heads that are close to the lexical head are semi-lexical, those that are close to the maximal projection node are functional heads. I leave a more principled solution for future research. One promising possibility would be to make use of the notion of headedness that phonological element theory (cf. Harris & Lindsey 1995, and references cited there) employs: |<u>M</u>|•|H| for functional heads, |M|•|<u>H</u>| for semilexical heads. The underlined Label, the head is, in a sense dominant, while the other is recessive. This yields the desired distinction. But proximity to M and H respectively might work well too, as the distinction between lexical and functional is, to a certain extent gradual, squishy (cf. Ross 1972a, 1973).

No problem arises with *XX from the point of view of the categorial features for N and V. Note however that *XX is blind to the fact that the two slots are also both dominated by M and H. This may be a matter of hierarchy, but it requires further thought.

A/AP is defined as a slot dominated both by N and V. By *XX it cannot be structurally adjacent to either N or V. This is desirable to the extent that APs can never be categorially selected by either N or V, nor can A take any N^{max}-complements (obliquely case marked DPs are PPs, see below) or "bare" V^{max} complements. Hence APs can only occur as predicates or attributively. For predicates, see below, for attributive APs I will assume that they are always grafted, i.e. are on a different tier altogether.[21] This may also extend to adverbial phrases in the verbal projection (originating perhaps in Keyser 1968). See Figure 5.

Muysken's (1983) insight about heads that function by themselves as phrases (such as adpositional particles or 'short' adjective-based adverbs), which he expressed as [–PROJ, +MAX], by linking an x-slot simultaneously to H and M. can be straightforwardly represented in this system, as shown in Figure 6.

An interesting question arises as to the status of 'dummy' adpositions as found in direct partitive constructions such as English *a glass of wine,* which is arguably (cf. Van Riemsdijk 1998) a single (extended maximal) projection. One way of expressing this type of dummy preposition would be as in Figure 7. It is adpositional by not being linked to either N or V, furthermore, while as a word it will fill a dotted slot, but it will have no level features. Other approaches may be possible, but I will not pursue this issue here.

21. For the notion of 'graft', see Van Riemsdijk (2001, 2006).

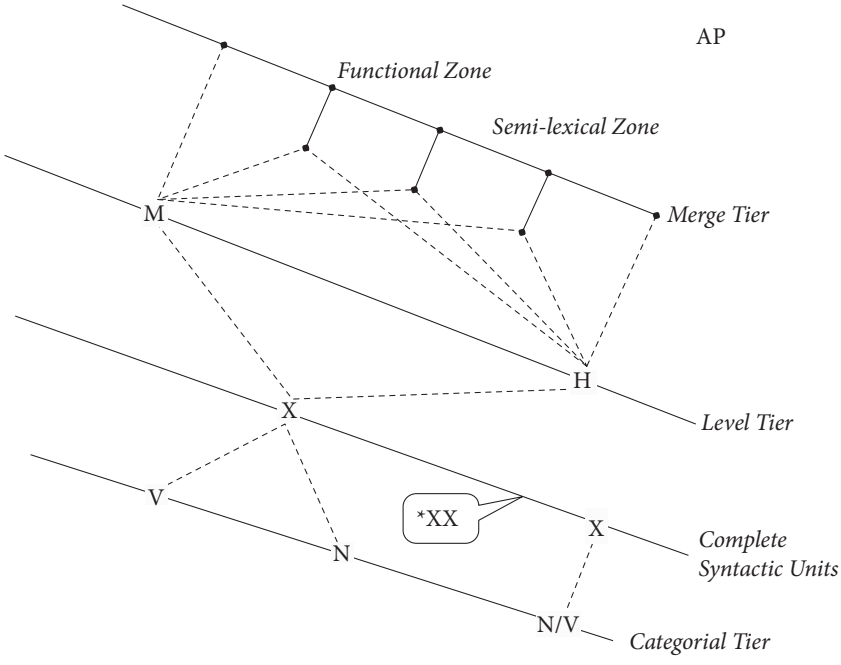

Figure 5.

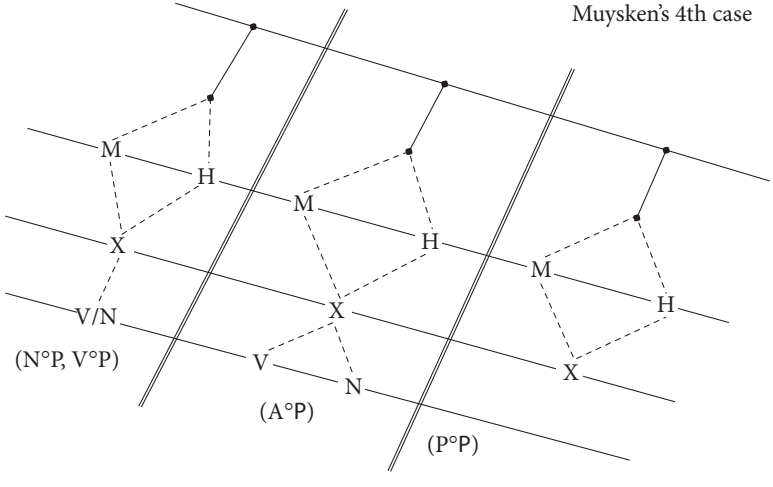

Figure 6.

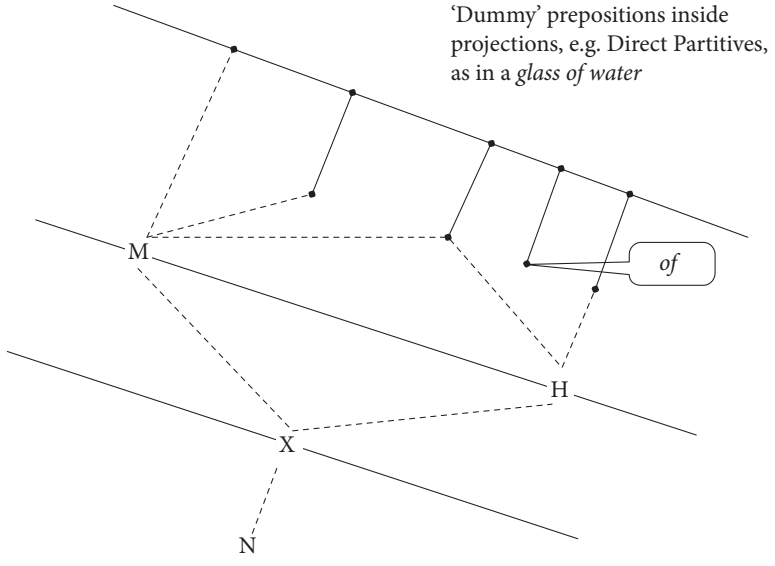

Figure 7.

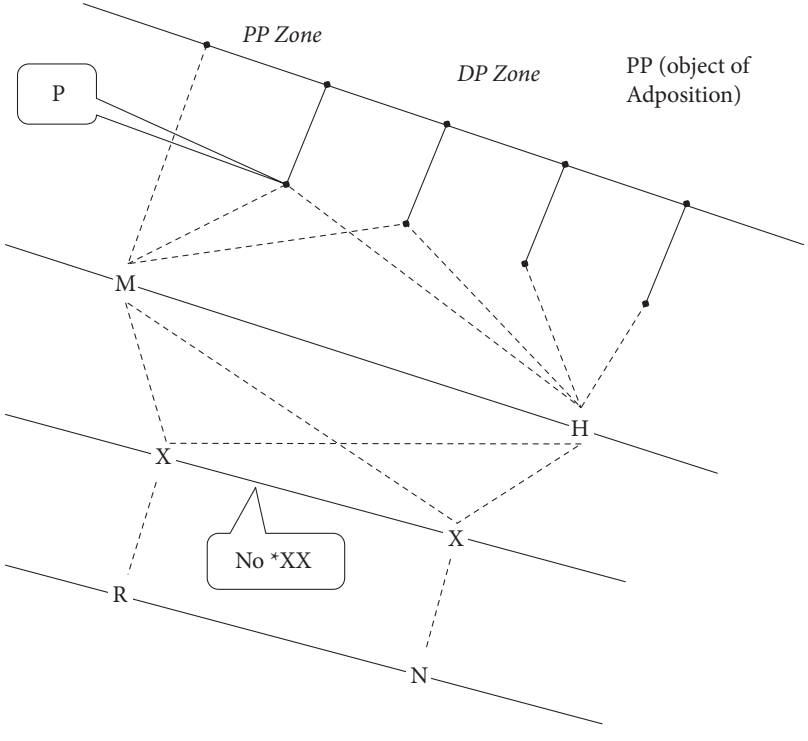

Figure 8.

More generally, the question arises as to how the versatility of P/PP should be incorporated into this system. In the old system this was done by allowing both [+N, –V] and [–N, +V] to be dominated by [–N, –V], at the expense of making arbitrary use of the +/– values of the features. Here I propose to introduce a third category feature: R (for Relator), cf. Den Dikken (2006). See Figure 8. Once we have introduced the category label R, this label might also be used for the representation of predicative APs and DPs. Details remain to be worked out, but the two types of PP that we have distinguished above, viz. adpositional objects interpreted as a PP-shell on top of a DP and CPs interpreted as an adpositional shell on top of IP/TP could be represented in Figures 8 and 9 respectively.

A distinct advantage of the present approach to categorial features is that hybrid categories such as nominalizations and gerunds can be straightforwardly represented by using multiple slots as in Figures 8 and 9. This is illustrated in Figure 10.

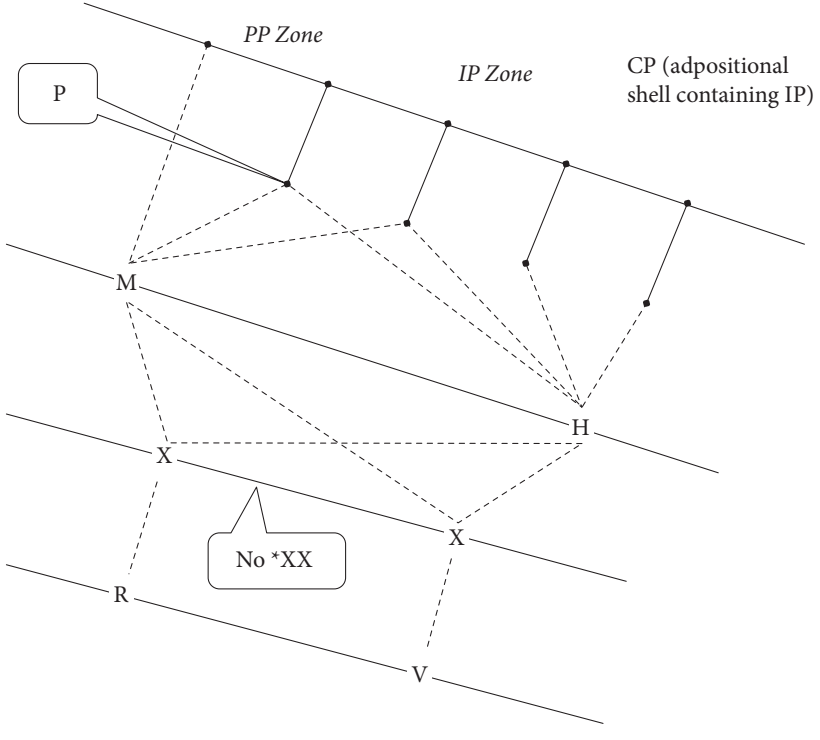

Figure 9.

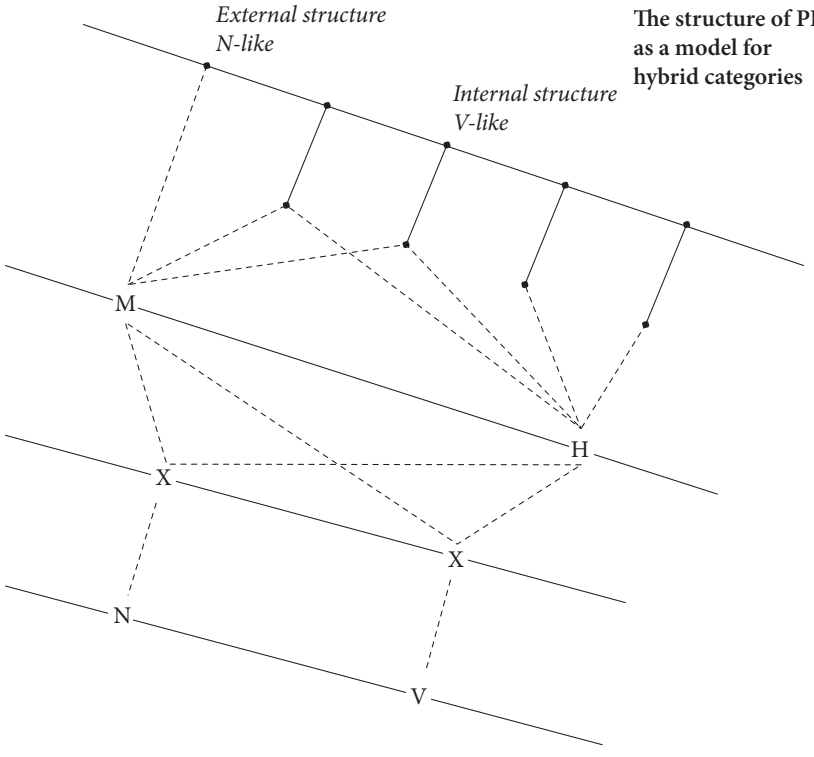

Figure 10.

It is a well-known fact that phonological structure is hierarchically organized, as is evident, for example, from the structure of the syllable which is generally taken to consist of an onset and a rhyme, where the rhyme in turn is made up of a nucleus and a coda. Nevertheless, phonological structure is often taken to be flat in the sense that phonological units are concatenated. In this sense, then, phonology would be fundamentally different from syntax in that it would lack recursion. Given the representational model I have presented a sketch of here, we must ask whether simple concatenation, as in phonology, would be sufficient. The answer has to be no: we need to incorporate the notion of merge into the system. How this is to be done is another difficult question. If we want to express the notion that a head combines with a phrase to create a new phrase, then merge needs to be incorporated. My preliminary idea is to interpret MERGE as a special connector between a head and a complete syntactic unit. This at least would be the core case. This is very impressionistic (as is most of the above) and ways of formalizing these notions have to be studied. A solution may be found along the lines of Vergnaud's

clock-style concatenations (Vergnaud 2003). See also Liao (2011). Take a simple example (from Dutch).[22]

(15) *kopen die twee flessen wijn*
buy those two bottles <of>-wine

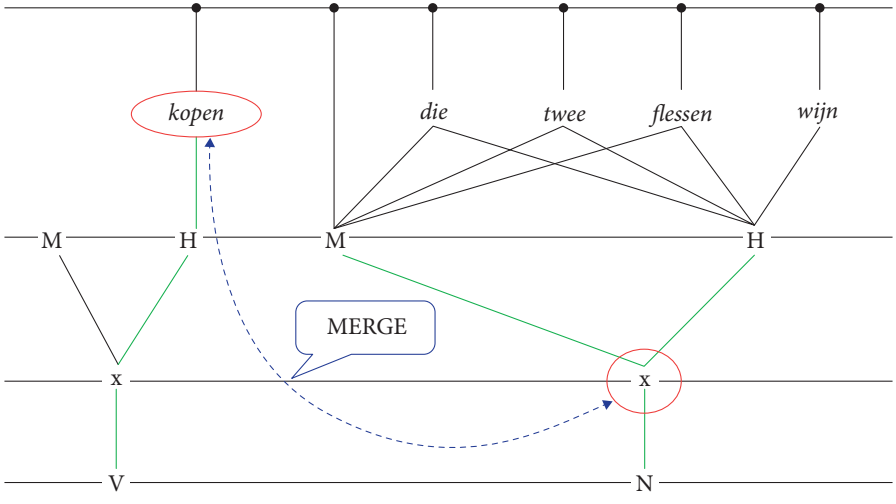

Figure 11.

MERGE can be seen as a concatenation operator on a par, say, with the one that concatenates syllables, where, depending on how much structure there is, the core relation can be taken to be the one between the nucleus of one syllable and the complete following syllable, schematically:

(16) $[_{\sigma}$ Onset $[_{\text{Rhyme}}$ Nucleus Coda] σ]

6. Conclusion

Much remains open. For example, if the representations I have proposed are on the right track, it is not clear that the notions of X-bar theory, bare phrase structure and tree structures are not an epiphenomenon. That is, it is possible that the 'merge tier' in Figure 5 above can be eliminated altogether. It is equally unclear whether there is any real sense (beyond habitude and convenience) in which these structures can or should be translatable into tree representations. I do, however, feel that the notions

22. The example abstracts away from the fact that Dutch is SOV.

(lexical) head and maximal phrasal unit must be primitives in some way in order to properly express the magnetic forces at work in intra- and extra-phrasal structure. The rather informal, impressionistic considerations presented in the present contribution do not pretend to be more than an idea for a potential research program.

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CHAPTER 4

Computational and semantic aspects of resumption

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Taking the properties of Welsh relativization as a point of departure, this paper argues that the linking of resumptive pronouns to the periphery is a strictly narrow-syntactic process, triggered by the uninterpretable features of resumptive pronouns and c-commanding complementizers and reducing to non-local *Agree*. Resumptive dependencies also give rise to reconstruction effects, which can also be detected in structures that have a different derivational history – the intrusive dependencies involving a strong island. It appears that, in both types, the internal structure of the pronouns involved is exclusively responsible for the various reconstruction options. In other words, the specific way pronouns are linked to the periphery (*via* a probe-goal relation or *via* binding at the interface) plays no role in their reconstruction properties, the fact that they have an internal structure plays no role in their distribution. This state of affairs has interesting implications concerning the "semantic blindness" of syntactic operations (Uriagereka 2002).

The Strong Minimalist Thesis (*SMT*, Chomsky 2000) states that the grammars of natural languages are optimal solutions to the problem of establishing a link between linguistic meaning and sound. This claim leads to the expectation that many properties of narrow syntax derive from the necessity to create linguistic objects that meet the requirements of the two cognitive systems, C-I and SM, with which the language faculty interfaces. The concern for interface legibility, however, does not imply that linguistic phenomena should exclusively be dealt with from an interface perspective and their syntactic aspects taken for granted or ignored.

A second feature of the Minimalist Program is the decision to fully acknowledge the syntax-external character of some aspects of LF (θ-criterion, selectional restrictions, duality of semantics…) and PF (linearization…), which were duplicated within syntax in the Principles and Parameters framework, and to reassign them to the external systems, Σ and Φ. This theoretical stand has two types of consequences. First, syntactic processes have properties of their own, which cannot be

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discovered just by looking at the interfaces and in particular cannot be motivated by semantic considerations. In effect, some of them are not relevant to interpretation at all. Case-checking, φ-Agree and, to some extent, A-movement itself are cases in point. Second, the syntactic processes which have a clear interpretive import, such as A′-movement, cannot be said to be *motivated* by semantic considerations. This point is made by Uriagereka (2002: 212), who refers to this aspect of syntactic computations as "semantic blindness".[1] In other words, syntax just makes available syntactic objects which are taken advantage of to represent the richness of the semantics. The autonomy of the computational system and the eviction from syntax of (non structural) semantic and phonological dimensions give rise to a grammatical architecture in which the relation between form and meaning is far from trivial and is certainly not as straightforward as some approaches assume.

The present work reconsiders the question of the relation between syntactic derivations and meaning in the light of a specific phenomenon, namely resumption, concentrating on the computational and semantic aspects of resumptive dependencies in Welsh relative clauses.

As a starting point, it is worth reproducing McCloskey's (2005) enlightening observations on the "Janus-like nature" of resumptive pronouns, "one face towards the domain of pronouns and anaphoric elements, the other towards the theory of movement." McCloskey's characterization deserves to be quoted in full:

> Since resumptive pronouns are pronouns…, a series of questions can be asked about where they fit in the context of the general theory of pronominal anaphora… But since they simultaneously appear in positions which are canonically associated with the appearance of gaps, one can also ask a series of questions about how resumptive elements interact with the processes which create gaps.
>
> (McCloskey 2005: 96)

On the one hand, resumptive pronouns (henceforth RPs) are pronouns and, as such, should share at least some distributional characteristics and interpretive properties with other (not A′-bound) pronouns. On the other hand, there is an obvious similarity between movement and resumption, made even more manifest by the fact that in some languages, RPs freely alternate with gaps in some positions. Following McCloskey's lead, I will successively consider two aspects of resumption: computational ones and semantic ones. The aim of the first part (Sections 1 to 4) is to determine how RPs are linked to the periphery and how and why their distribution differs from that of gaps. It will appear that the divide between the

1. In its original formulation, Uriagereka's principle is a statement about movement operations: movement is insensitive to semantic motivations, but can have semantic import. It can be extended to all the narrow-syntactic processes which are part of the computational system.

gap strategy and the resumptive strategy, at least in Welsh relative clauses, can be accommodated in purely derivational terms, once one specifies the syntactic status of the pronouns that serve as RPs and the feature composition of the two subordinating particles that introduce Welsh relatives – *a* and *y/yr* –, which can be argued to be complementizers on the model of McCloskey's (1979), (1990) analysis of Irish relative particles. At the same time, the question arises of how to account for the significant variation in the distributional properties of RPs across languages.

On the semantic side (Section 5), resumptive structures, just like gap structures, give rise to reconstruction phenomena. They display scope and binding effects under reconstruction, but no principle C effects. It has been argued by Rouveret (2005, 2008) and Guilliot (2006) that this complex set of properties can be accounted for if resumptive dependencies contain a copy of the antecedent in the lowest position, but a copy that has not exactly the properties of a copy-trace of movement.[2] The view defended here is that the relevant copy is provided by the personal pronouns themselves, which are endowed with an internal structure. A feature that is worth attention is that reconstruction effects can also be detected in constructions that have a different derivational history – this is the case in strong island contexts in Welsh, cf. Section 5 – and also in languages where the syntactic conditions on resumption differ from the ones observed in Welsh (for example, languages where RPs apparently freely alternate with gaps or where resumptive dependencies obey less restrictive locality constraints).

This state of affairs has potentially interesting implications concerning the relation between the computational properties of resumption and its semantic aspects. This study points to the conclusion that the derivational origin and history of RPs, whatever it is, doesn't hold the key to their semantic properties and it supports the minimalist view of the syntax-semantics relation, which is appropriately summarized by Uriagereka's (2002) Semantic Blindness Principle.

1. Resumptive pronouns: What they are and where they are found in Welsh

The label "resumptive pronoun" refers to the overt pronominal element found in some languages in the variable position of unbounded A′-dependency constructions. The latter include relative clauses, constituent questions, comparative clauses, dislocation and focus constructions.[3] An A′-dependency necessarily associates two

2. I follow Guilliot in referring to the tail of the resumptive dependency as a "copy" of the antecedent.

3. In the Celtic languages considered here, questions and topicalization constructions are standardly analyzed as relative structures adjoined to a *wh*P or a DP head.

syntactic objects: an operator element realized in an A′-position and a variable in a thematic A-position, bound by the operator. In this work, I will be exclusively concerned with languages that make a productive use of RPs and, in particular, resort to them in positions from which movement is or should be available. The direct object position of a simple relative clause is such a position. The pronominal element (in bold italics) occurring in the Hebrew sentence (1a) qualifies as a RP. But the RP can also be dispensed with in this position and replaced by a silent element, as (1b) shows.

HEBREW (Borer 1984)

(1) a. raiti et ha-yeled še rina ohevet ***oto***
I saw ACC the-boy that Rina loves him
'I saw the boy that Rina loves.'

b. raiti et ha-yeled še rina ohevet [__]
I saw ACC the-boy that Rina loves
'I saw the boy that Rina loves.'

Since the main empirical basis of this study is provided by relative clauses in standard literary Welsh, I will first present the Welsh data and then briefly consider which of the listed characteristics should be taken as defining properties of resumption and which ones should be considered as specific to Welsh or to a restricted subset of languages.[4]

The hallmark of a resumptive dependency is that the variable occupying the bound position is pronominal. In Welsh, it can be an independent pronoun, a prefixed clitic pronoun or an agreement marker doubling the variable position.[5] It takes the form of an independent pronoun, when it is the object of an invariable preposition, cf. (2a). When the preposition is inflected, it is realized as an agreement marker incorporated into the preposition – the preposition *am* 'about' in (2b).[6]

(2) a. y dyn y siaradasoch chwi ag ***ef***
the man *y* spoke you with him
'the man that you spoke with'

b. y dyn y soniais amdan***o*** [__]
the man *y* I talked about.3SG.M
'the man I talked about'

---

4. For in-depth studies of resumptive dependencies in the colloquial language, which displays different features, cf. Willis (2011) and Borsley (2013).

5. I leave aside the case of "epithets", which can also function as resumptive elements. On epithets in Irish, cf. McCloskey (1990). On epithets in Jordanian Arabic, cf. Demirdache (2015).

6. The Welsh examples in this section are taken from Rouveret (1994), except when indicated.

It takes the form of a clitic prefixed to the verb-noun when the relativization site is the object position of a verb-noun, in an aspectual periphrastic construction for example, cf. (3).

(3) y dyn yr oedd Mair wedi ***ei*** weld [__]
the man *y* was Mair PERF CL.3SG.M see.VN
'the man that Mair had seen'

A remarkable feature of Welsh relativization is that in no position is there a free choice between the resumptive strategy and the gap strategy: a bound pronoun cannot occur in a position where a gap is legitimate; a position which can host a bound pronoun is an inappropriate site for a gap. Situations similar to that illustrated by the Hebrew examples (1) simply do not occur. When the relativization site is the local direct object position (that is, the direct object position of the clause adjacent to the relative antecedent), only the gap option is available and a specific complementizer, *a*, distinct from the "resumptive" one, *y/yr*, is used, cf. (4a). On the contrary, Welsh resorts to the resumptive strategy in multiple embedding contexts (provided that no strong-island boundary intervenes between the relativization site and the antecedent).

(4) a. y dyn a wêl Wyn [__]
the man *a* sees Wyn
'the man that Wyn sees'
b. y dyn y gwn y gwêl Wyn ***ef***
the man *y* I know *y* sees Wyn him
'the man that I know that Wyn sees'

Subject relativization gives rise to a similar pattern. The gap strategy is the only option for the relativization of the local subject and in this case, the finite verb takes a default form, homophonous to the 3rd person singular one, whatever the number feature of the relativized subject, as shown by (5a), (5b) and (5c). The resumptive strategy is the only possibility for the relativization of non-local subjects in multi-clausal dependencies, cf. (5d), (5e).[7]

7. I take the "rich inflection" on the verb in (5d) to qualify as a resumptive element, just like the prepositional inflection in (2b), and the "poor inflection" in (5a) not to have this status. In other words, the subject position in (5d) contains a null pronoun identified by the doubling inflectional marker (or hosts an element which is part of a pronominal complex), whereas the subject position in (5a) doesn't contain such an element, since no complete φ-matrix is present, and can thus be occupied by a copy-trace. For different proposals, see Adger and Ramchand (2005) and Willis (2011).

(5) a. y plant a ddarllen***odd*** [__] y llyfr
the children *a* read.PAST.3SG the book
'the children who read the book'
b. *y plant a ddarllenasant [__] y llyfr
the children *a* read.PAST.3PL the book
c. *y plant y ddarllenasant [__] y llyfr
the children *y* read.PAST.3PL the book
d. y plant y gwn y darllen***asant*** [__] y llyfr
the children *y* I know *y* read.PAST.3PL the book
'the children that I know read the book'
e. *y plant a wn a ddarlen***odd** [__] y llyfr
the children *a* I know *a* read.PAST.3SG the book

The notion of resumption also subsumes some contexts that systematically force the use of pronouns in positions that are only potentially accessible to movement. In languages that lack both the preposition stranding option and the PP-fronting option, relatives formed on the object of a preposition generally display a RP in the relativization site. Similarly, in languages where the pied-piping of the nominal head is not available, the relativization of the possessor in a genitive construction gives rise to a resumptive structure. In the relevant constructions, the RP is the only choice, it cannot be replaced by a gap. The possessive constructions (6) illustrates the same point as the prepositional object constructions (2a) and (2b).

(6) a. Dyma 'r dyn y cusanaist ti ***ei*** fam [__]
here is the man *y* kissed you CL.3SG.M mother
'Here is the man whose mother you kissed'
b. Dyma 'r dyn y gwn y cusanaist ti ***ei*** fam [__]
here is the man *y* I know *y* kissed you CL.3SG.M mother
'Here is the man whose mother I know you kissed'
c. *Dyma 'r dyn y cusanaist ti fam [__]
here is the man *y* kissed you mother

I will assume that the pronominal elements in (6a), (6b), (2a) and (2b) also qualify as RPs, although they occupy or double a site where, strictly speaking, a gap cannot occur. It is easy to check that a maximal PP projection can occupy the initial position in interrogative constructions and that no resumptive is present in this case, cf. (7a). But the resumptive becomes mandatory if the initial element is the interrogative object of the preposition. In (7b), it takes the form of an inflectional marker on the preposition. Interrogative constructions in which the question target is the Possessor display the same pattern as (7a): the pied-piping of the nominal head is the only option in this context, cf. (8).

(7) a. Am ba athro y siaradodd pob myfyriwr [__] ?
about which teacher *y* spoke each student
'Which teacher did each student talk about?'
b. Pa athro y siaradodd pob myfyriwr amdan***o*** [__] ?
which teacher *y* spoke each student about.3SG.M

(8) Llyfr pwy athro a brynodd pob myfyriwr [__] ?
book which teacher *a* bought each student
'Which teacher's book did every student buy?'

The languages where resumption is a productive grammatical strategy in the formation of A′-dependencies also resort to pronouns as a saving device, inserting them in positions where the presence of a gap would violate a locality constraint. Many languages use the same pronominal forms in island contexts and in non-island contexts, which gives the impression that resumptive dependencies can be established across strong- and weak-island boundaries without giving rise to subjacency effects. The case of Welsh is more complex. In this language, the pronominal forms that stand at the tail of a resumptive dependency cannot be linked to an antecedent across a strong island boundary, as discovered by Tallerman (1983).[8] This holds both for independent pronouns (*hi* in (9a)) and proclitic pronouns or agreement markers doubling the relativization site (*-o* in (9b)). But in doubling contexts, inserting an "echo" or "auxiliary pronoun" in the doubled position redeems the locality violation. (9c) is much better than (9b).[9]

WELSH (Tallerman 1983)

(9) a. *Dyma 'r ffenestr y tarais i'r bachgen a dorrodd ***hi*** ddoe
that is the window *y* hit I the boy *a* broke it yesterday
'That's the window that I hit the boy who broke it yesterday'
b. *Dyma 'r dyn y cusanaist ti 'r ddynes a siaradodd
that is the man *y* kissed you the woman *a* talked
amdan***o*** [__]
about.3SG.M
'That's the man that I kissed the woman who talked about him'
c. ?Dyma 'r dyn y cusanaist ti 'r ddynes a siaradodd
that is the man *y* kissed you the woman *a* talked
amdan***o*** ***ef*** [__]
about.3SG.M him

8. Cf. Borsley, Tallerman and Willis (2007) for additional discussion.

9. The implications of examples (9) will be discussed in Section 4.

Suppose that, following Sells (1984), one establishes a distinction between two pronominal uses in A′-dependencies: the bound pronouns found in productive resumptive languages in non-island contexts exemplify the resumptive use; the pronouns that endorse a rescuing function in island contexts illustrate the "intrusive" use.[10] The gist of Tallerman's discovery is that both independent and dependent pronouns are excluded from island contexts in Welsh (just as copy-traces of movement are), but that the insertion of an auxiliary pronoun in doubling contexts functions as a repair strategy. In slightly different terms, independent pronouns, prefixed pronouns and agreement markers exclusively have a resumptive use, not an intrusive one. On the contrary, clitic or agreement + auxiliary pronoun complexes have an intrusive use and cannot be used resumptively (cf. Section 4). It can be concluded that the two uses are morphologically distinguished in Welsh.

It is interesting to observe that weak islands are more liberal in this respect and that, in general, no subjacency effects are detected in these contexts.[11]

WELSH (Tallerman 1983)

(10) eiriau na wyr Mair ddim sut i *'w* defnyddio [__]
words *na* knows Mair NEG how to CL.3PL define.VN
'words which Mair doesn't know how to define'

Welsh displays still other successive cyclicity effects. We don't know whether the link between the relative head and the RP in (11) is established in a successive cyclic fashion or not.

(11) y llong y gwn y gwerthodd y dyn *hi*
the boat *y* I know *y* sold the man her
'the boat that I know that the man sold'

But colloquial Welsh provides an interesting clue. In the standard literary language, the resumptive strategy is the only choice for the relativization (or questioning or topicalization) of the object of a verb-noun. A clitic pronoun, presumably adjoined to the v head governing the verbo-nominal phrase, is prefixed to the verb-noun, as the simple interrogative clause (12a) illustrates. In multi-clausal dependencies where the relativization site is the complement of a verb-noun, the resumptive clitic doubles the variable site and is spelled out only once, as (12b), shows. But in colloquial Welsh, one finds examples where a pronominal clitic is prefixed to all

10. Pronouns endorse the same rescuing function in English and French, which are not resumptive languages.

11. *na* is a negative relative particle.

the verb-nouns intervening in the resumptive path, not just to the lowest one, as would be the case in the standard literary language. (12c) illustrates this property.[12]

(12) a. Beth yr ydych chwi yn ***ei*** wneud [__]
what *y* are you PROG CL.3SG.M do.VN
'What are you doing?'

b. Beth yr ydych chwi yn disgwyl i mi ***ei*** wneud [__]
what *y* are you PROG expect for me CL.3SG.M do.VN
'What do you expect me to do?'

c. Beth wyt ti 'n ***ei*** ddisgwyl i mi ***ei***
what are you PROG CL.3SG.M expect.VN for me CL.3SG.M
wneud [_]
do.VN
'What do you expect me to do?'

This morphological characteristic can be taken to reflect the way the syntactic derivation works, namely in a cyclic fashion, from smaller domains to larger ones.

It is natural to conceive the successive cyclicity effects reviewed in this section as reflecting core properties of the computational system. Trying to trace them back to plausible external interface conditions would no doubt turn out to be a desperate enterprise.

In guise of a conclusion, it should be emphasized that some of the features of Welsh relativization that have just been listed either are specific to Welsh or are properties of resumptive dependencies in a restricted subset of languages.

i. The perfect distributional complementarity found in Welsh between RPs and gaps is by no means a defining characteristic of resumption. It is not observed in Irish, a language belonging to the other branch of the Celtic family, nor in Hebrew.

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12. (12c) is adapted from Harlow (1981: 252). For an extensive study of clitic distributions in long-distance dependencies, cf. Willis (2011). The higher clitic in (12c) need not be realized: the mutation on the verb-noun *ddisgwyl* suffices to signal its presence. An additional characteristic of this construction is that the higher clitics may fail to agree with the antecedent *wh*-phrase (and take the 3rd person masculine form), when the lower one does. Willis (2011) provides the following example:

(i) Pa lyfrau wyt ti 'n ei feddwl oedd Megan
which books be.PRES.2SG you PROG CL.3SG.M think.VN be.IMPF.3SG Megan
yn eu darllen [__] ?
PROG CL.3PL read.VN

(22) below shows that the recourse to the default form is not an exclusive property of long-distance dependencies: object clitics don't always agree in local dependencies either.

ii. Many languages resort to the same pronominal forms in the resumptive use and in the intrusive use. Irish, Hebrew belong to this class. If I am right, this is not the case in Welsh.
iii. All Celtic languages resort to distinct subordinating particles to introduce gap and resumptive relatives. The morphological differentiation of complementizers is not observed in all productive resumptive languages.[13]

2. Computational aspects of A′-dependencies: Resumption vs. movement

Addressing the question of the computational aspects of resumption requires that a formal account of the divide between resumption and movement be proposed and that a decision be made concerning the derivation of resumptive dependencies: is movement involved, as in gap structures, or is the required link between the RP and the periphery of the highest clause (i.e. the clause adjacent to the relative head) established *via* an interpretive or binding process? A further interrogation bears on the level at which the resumptive dependency is established, in the narrow syntax, at LF or after syntax, in the semantic component.

The problem of the interaction of resumption with movement is a rather complex one.[14] A sharp distinction should be established between the following two questions:

(13) Which properties, if any, do resumptive structures share with gap structures?

(14) Does the derivation of (a subset of) resumptive structures involve movement?

I adopt the standard view that the derivation of gap structures involves movement – the relative (or interrogative) site contains a copy of the moved element, not, say,

13. For additional data illustrating the syntactic variation between resumptive dependencies across languages, see the papers collected in Rouveret (2011a). The Irish case is considered in some detail in Rouveret (2017, Chapter 9).

14. Borsley (2013) develops a HPSG analysis of Welsh unbounded dependencies. In his view, "gaps and RPs differ in their distribution, but otherwise are quite similar". This conclusion is supported by the subjacency effects reported in (9). The fact that no morphological differentiation among complementizers is observed in the colloquial register he studies accentuates the similarity even more, as does the absence of any clitic affixed to the verb-noun in structures like (3) and (12a). It seems to me that Borsley's analysis is based on the mistaken assumption that the only device available to "transformational" grammars to deal with dependencies is movement. And he says nothing about the semantic properties of RPs, as compared with those of gaps. As I argue here, the problem raised by RPs is not that they resemble gaps, but that they are partially similar, but not fully identical, to them.

a *pro* (*pace* Adger and Ramchand 2005). If it turns out that resumptive structures display the computational and interpretive characteristics that are found in gap structures, one could simply decide that their derivation involves movement. But it could be the case that only a subset of resumptive structures resort to movement. Whence the cautious formulation in (14). Next, the movement account of resumption can only be taken seriously if the technical details of the resumptive derivation are made explicit. In fact, the options to be considered are not many. The RP could be nothing else but the spell-out of a trace of movement. In this view, the whole content of the targeted position is moved, leaving a copy-trace of the moved material, which happens to be spelled out as a pronoun. An analysis along these lines seems to be appropriate for languages like Vata and Gbadi (Koopman 1983) and Swedish (Engdahl 1985). Alternatively, the presence of the RP in the variable site could be taken as evidence that only a subpart of the material occupying the targeted position has moved. In the analysis developed by Aoun, Choueiri and Hornstein (2001), Boeckx (2003) and, in pre-minimalist terms, by Rouveret (1994), the displacement operation overtly moves the NP-part of a big DP including both the antecedent and the resumptive element, "stranding" the pronoun. If the second option is correct, the syntactic objects displaced in gap structures and in resumptive structures do not coincide. And resumptive structures are not expected to display exactly the same properties as gap structures. Whence question (13). A major implication of the "stranding analysis"[15] is that the content of the variable position must be taken to have a more fine-grained structure than appears at first. It cannot reduce to a pronominal head or morpheme, since the latter corresponds to what is left after movement has occurred. The syntactic object first merged in the variable position looks rather like a definite description (this is the way semanticians propose to analyze E-type pronouns). It will appear that the assumption that pronouns, and in particular RPs, are endowed with an internal structure is independently forced on us by the reconstruction properties of resumptive structures. As a matter of fact, this conclusion is independent of the derivational option which is adopted. It also holds in non-movement analyses, such as the one presented here.

But the dominant view in the eighties and the nineties was that the derivation of resumptive relative structures doesn't involve any movement in the syntax, but the establishment at LF of a binding relation between the base-generated RP and a (possibly null) operator c-commanding it. The LF-binding analysis of resumption, developed by McCloskey (1990) for the Irish data, is supported by the fact that resumptive dependencies in Irish and elsewhere appear not to give rise to subjacency effects. If one accepts the Principles and Parameters view that island

15. This label is borrowed from Boeckx (2003).

effects should be interpreted as symptoms of subjacency violations, this state-of-affairs corresponds to the expected situation if one adopts Huang's (1982) conclusion that overt movement processes obey subjacency, whereas covert processes do not. This is consistent with McCloskey's claim that resumptive dependencies are established *via* a binding process taking place at LF.

The analysis developed here, like McCloskey's (1990, 2001, 2002) one, is a non-movement approach to resumption. But it differs from McCloskey's proposal in that the linking of the resumptive element to the periphery in Welsh and also, presumably, in Irish is achieved in the narrow syntax, not *via* a binding process at LF. On the other hand, RPs are semantically interpreted in a post-syntactic component. The proposals argued for in this study are the following:

(15) The derivation of gap structures involves movement (*Move*).

(16) The derivation of resumptive dependencies involve *Agree* (not followed by *Move*).

(17) Resumption is a narrow-syntactic phenomenon.

(18) Intrusion is an interface phenomenon.

(19) (15)–(18) hold for Welsh and, possibly, for Irish.

3. A narrow-syntactic approach to Welsh relativization

My aim in this section is to develop a narrow-syntactic approach to Welsh relativization, capitalizing on the data in Section 1 and the observations in Section 2. I intend to show that the basic computational properties of resumption can be made to follow from the phasal theory of derivations, the properties of probe-goal relations and the non-locality of *Agree*. The proposed analysis is in line with recent proposals to reanalyze binding phenomena as grammar-internal derivational processes.

3.1 Feature endowment of Welsh complementizers

3.1.1 *The relative complementizer*

Two positions are necessarily involved in an A′-dependency: a variable position and an A′-position. As far as gap relatives are concerned, it is plausible to assume that their derivation doesn't dramatically differ from that of *wh*-constructions in other languages. Adopting Chomsky's (2000) analysis of these constructions and Adger and Ramchand's (2001) extension of it to Celtic relatives, I will claim that two sorts of features are necessary to build their structure and construct their interpretation. The first one specifies that we are dealing with a propositional domain

that functions as a predicate and contains a variable (Adger and Ramchand's λ). The second one serves to identify the term functioning as a variable and to link it to the periphery (Adger and Ramchand's [var]).[16]

Let us suppose that [var] can come in several guises. In English, the [var] feature that serves to identify the variable element in movement relatives is [wh]. At first sight, the case of Welsh *a*-relatives is different, since no movement of a relative pronoun is involved and only DP arguments can be attracted to the "relative" complementizer. The distinctive syntactic characteristic of nominal arguments is the presence of an interpretable [D] feature in the matrix of their head. But the presence of [i-D] certainly doesn't suffice to identify the relativized DP as the target of relativization and to distinguish it from the other DPs in the clause.[17] An additional feature must be part of the feature endowment of the relativized DP's, which must be uninterpretable since, in Chomsky's approach, a syntactic object can agree only if it bears an uninterpretable feature, which makes it active. For lack of a better choice, I will assume that the relevant feature is [u-wh].

[D] is also part of the feature make-up of *a*, along with [λ]. We end up with the following characterization of *a* (abstracting away from [tense] and/or [finite]):

(20) **features of the relative complementizer *a***
[i-λ]
[u-D]

The notation [i-λ] indicates that the feature [λ] on *a* is interpretable. On the contrary, the [D] feature is uninterpretable on *a* and needs to enter into an agreement relation with an object bearing the same feature, in order to be valued. The relevant relation is a probe-goal relation in Chomsky's (2000, 2001) sense and is established *via* the operation *Agree*. The goal associated with *a* is endowed with an [i-D] feature and also with an uninterpretable feature [u-wh], which makes it active. The latter is deleted as a side-effect of the establishment of the *Agree* relation, like the *wh*-feature on question words and the Case feature on nominals in Chomsky's (2000, 2001) approach.

Since *a*-relativization involves movement, it could be assumed that the matrix of *a* also contains an [EPP] feature. Indeed, when the relativized position hosts a nominal argument, the only option leading to the establishment of an operator-

16. I will basically adopt Adger and Ramchand's (2001, 2005) feature system here, with some modifications. For alternative systems, cf. McCloskey (2001, 2002), Rouveret (2002, 2005, 2008). Adger and Ramchand's (2001) system is intended to subsume the properties of Irish, Scottish Gaelic and Welsh relativization.

17. I adopt the notation introduced by Pesetsky and Torrego (2001), where *i* prefixed to a feature label means that this feature is interpretable and *u* means that it is uninterpretable.

variable relation consists in moving the argument to the periphery, in order to turn it into a binder of the variable standing in its original position (this is in sharp contrast with pronouns which are inherently bound elements). Since movement to the periphery is the only option anyway, positing an additional [EPP] feature on *a* could turn out to be unnecessary.[18]

3.1.2 *The resumptive complementizer*

I will adopt an analysis of resumptive relatives in which neither the relativized element (cf. Demirdache 1991; Sichel 2014) nor a subpart of it (cf. Aoun, Choueiri and Hornstein 2001; Boeckx 2003) moves. But the non-movement analysis doesn't imply that the operator-variable relation is constructed at LF or, even later, at SEM. If one restricts oneself to Welsh monoclausal dependencies, it seems that the relevant relation is established *via Agree* in the narrow syntax.

The basic claim defended here is that, in productive resumptive languages, resumption corresponds to the situation where the relevant link between the relativization site and the periphery implicates a pure *Agree* relation, not embedded into a token of *Move*. By definition, *Agree* operates on features and is the only operation able to provide a value for the unvalued feature of a functional item. This happens when a probe-goal configuration is available, such that the probing unvalued feature c-commands the valued feature defining the goal. *Agree* is thus highly sensitive to the feature composition of the c-commanding functional head, as well as to that of the c-commanded lexical item.[19] But in the case of resumptive dependencies, the identification of the relevant features is far from obvious. It meets with the same difficulties as the ones discussed by Hicks (2009: 112) in relation to anaphoric and pronominal dependencies. Hicks observes that "it is not at all clear that referential properties are encoded in φ-features. A system of φ-feature agreement between anaphors and their antecedents simply predicts that the two φ-feature values should be identical, but nothing more." In Hicks' view, the appropriate interpretation of anaphoric dependencies can only be derived if anaphors are lexically specified for an unvalued [var] feature. As for A-bound pronouns, they are inserted into derivations with a valued [var] feature. Similarly, what is at stake in resumptive structures is an operator-variable dependency, not just a φ-feature dependency. It is thus reasonable to claim that RPs also bear a [var] feature referring to their status as syntactic/semantic variables. I will assume that RPs are inserted into derivations with a valued interpretable [var] feature, exactly like A-bound pronouns in Hicks' analysis.

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18. I make abstraction of the Welsh complementizer *sydd*, which stands for the combination *a+mae* (3rd person form of *bod* "be" in the present tense).

19. The same holds for *Move*, if *Agree* is a precondition on *Move*.

The claim that RPs are also endowed with a φ-feature matrix is difficult to avoid. The real question is whether these features make any semantic contribution to the interpretation of resumptive structures. Dealing with A-bound pronouns and reflexives, Hornstein (2007) concludes that they do not. He justifies this conclusion on economy grounds. Bound pronouns seem to be the "elsewhere" case with respect to anaphors. In order to be able to compare the derivations that contain them, it is necessary to assume that they are not lexical items, included in the numeration, but by-products of grammatical operations, which can be inserted in the course of the derivation without violating the Inclusiveness Condition. Grolla (2005), Hornstein (2010), Sichel (2014) extend this idea to RPs, which correspond to the elsewhere case with respect to gaps. One can also make abstraction of the elsewhere status of RPs and adopt Demirdache and Percus' (2011) idea that all the elements present in LF representations are not necessarily interpreted and that RPs are among the elements that are not interpreted.

Morphological aspects of resumptive structures also lead to the conclusion that the φ-features of pronouns in these structures are not interpreted. These features usually recapitulate the φ-features of the relative antecedent.

(21) a. y plant y soniais amdan***ynt*** [__]
the children *y* I talked about.3PL
'the children I talked about'

b. y dyn y siaradasoch chwi ag ***ef***
the man *y* spoke you with him
'the man that you spoke with'

c. y ferch yr oedd ***ei*** mam [__] gartref
the girl *y* was CL.3SG.F mother at home
'the girl whose mother was at home'

d. Pa lyfr ydych chwi 'n ***eu*** prynu [__] ?
which books are you PROG CL.3PL buy.VN
'Which books are you buying?'

But colloquial Welsh provides a wealth of examples where no agreement occurs and the default 3rd person singular masculine pronominal form pops up. Parallel to (21d), we can have (22) (cf. Borsley 2013: 5).

(22) Pa lyfre ydych chi 'n ***ei*** brynu [__] ?
Which books are you PROG CL.3SG.M buy.VN
'Which books are you buying?'

This phenomenon, whose importance has been emphasized by Boeckx (2003), can also be observed in the prepositional constructions of Scottish Gaelic, cf. Adger and Ramchand (2005). The φ-features of RPs can be incomplete – [person: 3]

being their unique specification –, which suggests that they make no contribution to semantic interpretation. In Chomskyan terms, it is natural to take them to be uninterpretable, their deletion being contingent on the probe-goal relation involving the [var] feature.[20]

The feature composition of RPs (abstracting away from [Case]) is thus as follows:

(23) **features of RPs**
[i-var]
[u-φ]

The next question is: with which features on which head is the *Agree* relation established? I will assume that in monoclausal relatives, resumptive C is specified for a [λ] feature coding the fact that the clause it heads is the locus of an operator-variable relation and a [var] feature, unvalued on the resumptive C probe. The absence of value on C's [var] suffices to trigger the operation *Agree,* which establishes an agreement relation with the valued [var] on the RP. The uninterpretable feature [u-φ] plays a role similar to the [u-wh] feature in English interrogative and relative constructions: it serves to make the goal active and is deleted as a side-effect of the establishment of the *Agree* relation.

The feature endowment of resumptive C is thus as follows (again, abstracting away from [tense] and/or [finite]).

(24) **features of the resumptive complementizer *y/yr***
[i-λ]
[u-var]

A null operator is externally merged with the resumptive CP, binding the pronominal variable. I will leave it a moot point whether *y* must be endowed with an [EPP]-type feature in order to achieve the desired result.

(24) is quite similar to (20), all the more so that [u-D] can be thought of as a particular instance of [u-var]. Things would be simpler if [u-var] in (24) was simply [u-φ] But I hope to have shown that [var] and [φ] must be kept distinct.

20. Examples like (22) are interesting in their own right. But one should keep in mind that they are totally absent from the standard literary language and could be reflexes of a different grammatical system, namely that of the colloquial language. See also footnote 12 and Willis (2011) for an extensive study.

3.2 The domain of A′-dependencies

The Welsh examples reviewed so far indicate that the gap strategy is legitimate when the targeted position is (i) the highest subject position ((5a)) or (ii) the object position of the highest clause, when this clause is VSO ((4a)). The resumptive strategy is the only option in the other contexts, namely (iii) the subject position of an embedded declarative clause ((5d)), (iv) the object position of an embedded declarative VSO clause ((4b)), (v) the Possessor position in local and long-distance dependencies ((6a), (6b)), (vi) the object position of a verb-noun in the same contexts ((12a), (12b)), (vii) prepositional object positions ((2a), (2b)).[21] How should the domain relevant to the establishment of resumptive dependencies be characterized?

There are two ways to answer this question. Either the relevant domain is structurally defined, without any consideration of the domain involved in other A′-dependency relations, namely gap dependencies. Or it is characterized relative to gap dependencies. In the first case, the licensing requirement that resumptive dependencies must observe is stated in absolute terms. It just happens that this requirement and the one imposed on gap dependencies, are contradictory (in Welsh, at least, where distributional complementarity is observed). In the second case, the resumptive computation is evaluated relative to the movement/gap computation, which is the preferred option and is selected whenever possible, resumption being the elsewhere case.

The problem raised by the definition of the domain relevant to resumption is of course reminiscent of the one stemming from Condition B effects. Reuland (2001, 2006) and Hornstein (2007, 2010) bring up the question of the status of Condition B, once anaphoric binding is licensed by covert movement or agreement and Condition A is eliminated. If the distribution and interpretation of reflexives reduces to movement or agreement and if Condition B still governs the distribution and interpretation of pronouns, their being in (quasi-)complementary distribution is absolutely unexpected. To solve the problem, several proposals have been made, which generally rely on the claim that pronouns are employed only as a last resort, that is, when reflexivization fails. The RP/gap divide largely mimics the bound pronoun/bound anaphora divide. Suppose that, as suggested above, the movement strategy resulting in a gap is preferred over the resumptive strategy in the computation of A′-dependencies. The last resort approach to resumption, based on

21. I leave aside the case of adjunct relatives for the moment, but see 3.5.1. The structures in which a strong-island boundary intervenes between the relative antecedent and the variable position are considered in Section 5. In this case, intrusive pronouns are involved, not resumptive ones.

the intuition that pronouns are used when gaps are impossible, underlies many accounts of the distribution of RPs, starting with Shlonsky's (1992) innovative paper. In the early versions of this idea, a comparison between derivations, the resumptive one and the movement one, was involved. If both converged, the resumptive derivation was excluded. In the analysis recently proposed by Sichel (2014), the tail of a relative clause *movement* chain in Hebrew is realized as the least specified form possible. Resumptive pronouns are in competition with gaps in this respect and correspond to the elsewhere case.

An account, in which the domain relevant to resumptive dependencies and the one involved in gap dependencies are defined independently and happen to be strictly disjoint in a subset of languages, is also possible. I propose such an account in this section. What are the reasons underlying this choice? First, it is an empirical fact that Welsh resumptives are legitimate precisely in positions where gaps are excluded, the best case for the competition approach. But, as already emphasized, this strict complementarity should in no way be considered as representative of all resumptive languages. A second difference between resumptive binding and pronominal A-binding also motivates distinct analyses of the two processes. The reason why RPs which, like other pronouns, enter derivations with a valued [var] feature, should establish a relation with a binder is perfectly clear. They have to in order to satisfy a requirement of the resumptive complementizer: their [var] feature must be valued simply because C's [var] is not.[22] The dependencies involving pronominal A-binding and falling under Condition B are quite different, because the nominal antecedent doesn't need to bind anything.[23]

In Chomsky's (2000, 2001, 2004) framework, derivations proceed incrementally, phase by phase. The domains that qualify as derivational units, that is, as phases, are CPs, vPs and plausibly DPs. In order to move out of a phasal domain and avoid immediate spell-out, an element must first reach the edge of the phase that minimally contains it. We conclude that a gap in an A'-dependency, whether in the first Merge position or in a higher position, must always be locally bound within the phase that minimally contains it. Pronouns, on the contrary usually don't move and, don't have the ability to reach the phase edge.[24] The distinguishing factor between the movement strategy, where all the material in the relativization site

22. This explains why pronouns are used as resumptive elements and why anaphors are not.

23. The structural account could also be the right one for anaphoric dependencies, rather than the economy one.

24. If the movement analysis of resumptive structures invoked by Aoun, Choueiri and Hornstein (2001) and Boeckx (2003) is adopted, a subpart of the pronominal expression moves to the edge of the phase, but the [φ] matrix itself does not.

raises to SpecCP, and the resumptive strategy, where the [φ] matrix doesn't move, seems to be that, in gap structures, the phase *minimally* containing the variable position is headed by a category (= C) endowed with an unvalued [var] (= [D]) feature, whereas, in resumptive structures, this condition is not fulfilled. The two cases to be considered are schematized in (25) and (26), corresponding to the gap/movement and the resumptive cases respectively. The Greek letters α, β, γ stand for potential variable positions: in (25), α corresponds to the local subject position, β to an object position at the edge of vP; in (26), γ corresponds to a position internal to a vP, a DP or a non-relative CP.

(25) **Gap structure**
...[[C] ... α ... [$_{vP}$ β...]...]
[u-var] [i-var] [i-var]

(26) **Resumptive structure**
... [[C].... [$_{vP/DP/CP}$ ... γ ...]]...
[u-var] [i-var]

The domain of each dependency-type can tentatively be characterized as follows. (27) is relevant to resumptive dependencies:

(27) A RP must be A′-free in the phase that minimally contains it, where RP refers to the resumptive pronominal expression, and A′-free means "free with respect to the [var] feature of some phasal head".

To be plainly satisfactory, (27) should be reformulated in derivational terms and refer to narrow syntactic operations, such as agreement and movement. (28) is a better approximation.

(28) A RP doesn't participate in a probe-goal relation with the unvalued [var] feature of some head within the phase that minimally contains it.

In the languages where (28) holds, i.e. in productive resumptive languages, (29) also does:

(29) A movement variable participates in a probe-goal relation with the unvalued [var] (= [u-D]) feature of some head within the phase that minimally contains it.

(28) is relevant to resumptive dependencies, (29)to gap/movement dependencies.

3.3 Movement vs. local resumptive dependencies

(28) and (29) have interesting consequences. For example, a RP cannot occur in the highest subject position (that is, the subject position of the clause adjacent to the relative complementizer), a restriction which McCloskey (1990) refers to as the *Highest Subject Restriction* (cf. also Borer 1984). This restriction illustrated by examples (5a), (5b) and (5c), repeated here as (30), can be derived on a principled basis from (28) and (29).

WELSH

(30) a. y plant a ddarllen***odd*** [__] y llyfr
the children *a* read.PAST.3SG the book
'the children who read the book'

b. *y plant a darllen**asant** [__] y llyfr
the children *a* read.PAST.3PL the book

c. *y plant y darllen**asant** [__] y llyfr
the children *y* read.PAST.3PL the book

In (30a), the relative clause is headed by the gap/movement complementizer *a* and the inflected verb doesn't agree in number with the antecedent. The subject position following the finite verb contains a gap, that is a copy-trace of movement, not a RP (if the presence of poor agreement on the verb is taken as a clue that no resumptive element corresponding to the subject is present in the clause, cf. footnote 7). This situation is plainly compatible with (29). In (30b) and (30c), the finite verb is inflected for person and number and the inflectional marker can be taken as a resumptive element. The ungrammaticality of (30b, c) follows from (28), which prohibits a pronominal element from functioning as a resumptive goal when it belongs to the CP phase whose head bears the [u-var] feature (both *a* and *y* are endowed with such a feature).[25] The subject position is accessible to C, whether the *wh*-DP occupies the edge of vP or has moved to the inflectional domain.[26]

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25. The phenomenon illustrated by paradigm (30) is known in the literature as the "anti-agreement effect" (AAE). Other accounts of the AAE in Celtic and in other languages can be or have been proposed. Some take advantage of the feature-inheritance mechanism and its variants – AAE would be a clue that no transmission of φ-features from C to T has taken place, cf. Ouali (2008) on Berber. Others extend Chomsky's (2008) Multiple Agree analysis of interrogative structures to this case.

26. This analysis of the AAE raises the question of the status of examples like (22), which contain a default pronominal form. Two options can be considered. Either (22) is analyzed along the same lines as (30a) – the default form is taken as an indication that some movement from the object position of the verb-noun is involved – or (22) is identified as an authentic resumptive structure in which the RP happens to have an impoverished form. The fact that examples like (22) are exclusively found in the colloquial language, whereas the AAE is attested in all forms of

To account for the contrast between (31a) and (31b), which shows that the gap strategy is the only option in Welsh when the relativized element is the highest object, a derivation parallel to that of (30a) can be considered. The object argument in a VSO structure raises to the edge of the vP phase where it becomes accessible to the the relative C, Agrees with it and raises to it.[27] The occurrence of a RP in the shifted object position at the edge of vP is excluded by (28), whence the ungrammaticality of (31b).

WELSH

(31) a. y llong a werthodd y dyn [__]
the boat *a* sold the man
'the boat that the man sold'

b. *y llong y gwerthodd y dyn ***hi***
the boat *y* sold the man her

The local resumptive dependencies exemplified in Section 1 all satisfy the requirement in (28): the pronominal matrix functioning as a resumptive is minimally contained in a phasal domain (vP, DP, CP), whose head is not the [u-var] C. The structure relevant to (32a) and (32b) is (32c):

(32) a. y llyfr yr ydych chwi yn ***ei*** ddarllen [__]
the book *y* are you PROG CL.3SG.M read.VN
'the book you are reading'

b. y dyn y prynais ***ei*** dŷ [__]
the man *y* I bought CL.3SG.M house
'the man whose house I bought'

c. DP_i [$_{CP}$ Op_i [$_{C'}$ *y*... [$_{vP/DP}$... RP_i...]]]

If a [var] feature was present on the head of the vP or DP phase minimally containing the RP, a probe-goal relation would be triggered, which would make the RP inactive. And a violation of (28) would be involved. Only *y* is endowed with an unvalued [var] feature in (32c). The derivational path leading to the formation of the resumptive dependency in (32c) is thus as follows. The [u-var] feature on *y* probes and targets the [i-var] feature on the RP. An *Agree* relation is established, whose effect is to value *y*'s [u-var] and to delete RP's [u-φ]. The [λ] feature on *y* (possibly assisted by an [EPP] feature) forces the insertion of a null operator at the

Welsh, suggests that the literary language and the colloquial language instantiate different grammatical systems, cf. footnote 19. As far as the literary language is concerned, only the resumptive structure (21d) is relevant. The analysis of (22) in the colloquial language will be left open. It could indeed be a movement structure, cf. Willis (2011). I thank Huy Linh Dao for prompting me to clarify this point.

27. This is the case corresponding to β in (25) (β stands at the edge of vP).

edge of the relative CP. A crucial aspect of this account is that it presupposes that *Agree* can associate syntactic objects that do not belong to the same phase. If this account is on the right track, the properties of long-distance resumptive dependencies confirm that *Agree* is necessarily non-local (cf. Section 3.4).

An interesting phenomenon should be brought together with the situation exemplified by (32a) and (32b). (33a) and (33b) show that it is possible to infix a clitic to resumptive C.[28] The point is that the infixed pronoun cannot be the resumptive element itself. (33c), where the clitic is interpreted as coreferent to *y dyn*, is ungrammatical.

(33) a. y dyn y ’i rhoddais (ef) idd***o*** [__][29]
the man *y* CL.3SG I gave it to.3SG.M
‘the man to whom I gave it’

b. yr amser y ’ch gwelais [__]
the time *y* CL.2SG I saw
‘the time when I saw you’

c. *y dyn y ***’i*** gwelodd Wyn [__]
the man *y* CL.3SG saw Wyn
meaning ‘the man that Wyn saw’

This restriction can be derived in a natural way from (28), if the infixed clitic or the chain it heads is taken to be the resumptive element.

3.4 Long-distance resumptive dependencies

It is time to make explicit the mechanisms that underlie the derivation of long-distance dependencies. Consider the case where the pronominal element occupies the object position of an embedded tensed clause. The structure underlying (34a) can be schematized as in (34b).

(34) a. y dyn y gwn y gwêl Wyn ***ef***
the man *y* I know *y* sees Wyn him
‘the man that I know that Wyn sees’

b. DP_i [$_{CP}$ Op_i [$_{C'}$ *y* …[$_{CP}$ [$_{C'}$ *y* … RP_i …]]]]
[u-var] [i-var]

---

28. The adjunction of a clitic to the gap/movement complementizer is also legitimate.

(i) y dyn a’m gwelodd [__]
the man *a* CL.1SG saw
‘the man who saw me’

29. In (33a), *’i* doubles *ef* “it”, not *iddo* “to him”.

As shown in 3.2 and 3.3, phases are directly relevant to the divide between gaps and RPs. (28) amounts to the claim that a bound variable is spelled out as a pronoun if the head of the phase that minimally contains it doesn't bear an unvalued [var] feature. This means that the relevant A′-binder always occupies a position external to the minimal phase containing the pronominal variable, in other words, that more than one phase is involved in a resumptive dependency. The question is: how exactly is the resumptive dependency transmitted? What is the role of the C head intervening in the resumptive path in (34b)? The contrast between (31a) and (31b) indicates that no phase boundary intervenes between the object position and the local C in a VSO configuration. We can thus safely conclude that the lower *y* in (34b) doesn't bear an unvalued [var] feature. If it did, we would end up with a violation of (28), since a RP cannot be c-commanded by a [var] feature in the phase that minimally contains it. And if it did, an *Agree* relation with the RP would be triggered, depriving the latter of its uninterpretable feature and making it inactive, hence unable to value the [var] feature of the higher C. Only the higher complementizer in (34b) can and must be endowed with an unvalued [var] feature.[30] And it must also bears a [λ] feature, meaning that the relative clause is interpreted as a predicative domain in the semantics.

In order to link the RP to resumptive C in (34b), several options can be considered, depending on whether the derivation of resumptive dependencies is taken to involve some movement or no movement at all and on whether *Agree* is considered to fall under the *Phase Impenetrability Condition* (the PIC) or not.

Let us maintain the claim that the relation between the RP and the resumptive C in local dependencies involving a single CP domain doesn't result from movement. Adger and Ramchand (2001, 2005), Rouveret (2002, 2005, 2008) propose that the relevant operation is nothing but *Agree*, which, in this case, is not followed by an application of *Move*. Instead, the RP is bound by a phonologically null operator externally merged with the CP. Suppose that, in long-distance dependencies, a null operator is also merged with the CP minimally containing the RP (insertion takes place at the top of the tree). When the derivation carries on, the null operator moves until it reaches the resumptive C. The derivation would proceed as follows:

(35) i. *Agree* establishes a relation between the pronominal element and the head of the CP phase that minimally contains it;
ii. a null operator Op merges at the edge of the minimal CP phase;
iii. Op succesive-cyclicly moves to the edge of the CP headed by resumptive C.

30. What has just been said about the lower C in (34b) also holds for v and D in (32c).

It is schematized in (36):

(36) DP_i [$_{CP}$ Op_i [*y* [u-var] ... [$_{CP}$ ~~Op_i~~ [*y* ... RP_i [i-var] ...]]]]

In this analysis, *Agree* takes place only at the lowest CP phase containing the RP, *Move* is involved in the higher ones. The claim that a movement takes place in resumptive structures, but only from the edge of the (lowest) phase (not from within it) recalls Iatridou's (1991) idea that an operator can be inserted at the periphery of an island and move. It has several advantages. It doesn't rely on specific features being present on intermediate C heads: the null operator is attracted by an unspecified edge feature. Second, it straightforwardly captures the subjacency effect manifested by Welsh resumptive structures, cf (9): the movement of the null operator first merged at the edge of the resumptive phase is blocked by an intervening strong island boundary.[31] A potential objection against this proposal – the *Agree-then-Move* analysis – is that it resorts to the movement of a null operator, an option which is generally avoided.

A second possibility consists in dispensing with *Move* and resorting to *Agree* exclusively. The introduction of the *Agree* operation in the minimalist framework makes it possible to define chains whose links are independently merged and connected by *Agree*, rather than by *Move*. *Agree* chains are necessarily defined in derivational terms, under the assumption that *Agree* is phasal and subject to the *Phase Impenetrability Condition*. Under this approach, which can be referred to as the "*phasal Agree* analysis", agreement holds of intermediate C's within the span between the RP and the highest C. Intermediate Cs are first merged with an uninterpretable/unvalued feature, say [f], but they behave as f-valued goals for higher C probes once agreement between the lowest instance of C and RP or between a higher C and a lower one has taken place. Each intermediate C in long-distance dependencies is successively checked.[32] The process stops when the derivation has reached the [i-λ, u-var] C. Under this view, long-distance resumptive dependencies

31. The well-formedness of (i) indicates that the relativization of the possessor is possible across a subject boundary, which is supposed to define a canonical strong island boundary.

(i) y dyn yr oedd ei fam [__] gartref
the man *y* was CL.3SG.M mother at home
'the man whose mother was at home'

It appears that possessors can also form an *A'-movement* dependency across a subject boundary in some languages, Russian and French for example.

32. Adger and Ramchand (2005), Rouveret (2002, 2005, 2008) develop different versions of this idea. Legate (2005) resorts to phasal *Agree* in another context. The phasal *Agree* approach to resumptive structures has met with considerable skepticism.

illustrate a situation where cyclic agreement mediates between a head that needs to be valued and an element in a prior phase. The main difficulty encountered by this proposal lies in the identification of the feature [f] involved in the transmission of the dependency. The desired result could be achieved *via* φ-features present on the intermediate Cs (cf. Rouveret 2002; this is not Adger and Ramchand's proposal). Recall Browning's (1989) and Chomsky's (2000, 2001) insight that φ-*Agree* is the index-transmission mechanism essential to movement and agreement processes involving A-positions. If this idea is extended to resumptive dependencies, φ-agreement can be taken to hold of intermediate Cs on the path between the RP and the highest C. The major objection that can be levelled against this analysis is precisely that it relies on the presence of φ-features on intermediate Cs. It must be recalled that, in the approach sketched here, the uninterpretable feature that makes the RP active is [φ]. If this feature is involved in the *Agree* relation taking place at the lowest CP phase, the RP will cease to be active and it won't be possible anymore for its [i-var] feature to value resumptive C's [u-var].

Both the *Agree-then-Move* account and the *phasal Agree* account presuppose that the operation *Agree* falls under the PIC. I will follow a different route, based on the idea that *Agree* is unbounded or, at least, non-local. Bošković (2007) argues that certain syntactic operations can apply non locally and that *Agree* is one of them. The gist of his proposal is that the two major locality principles, the PIC, which imposes an impenetrability condition on movement (and possibly agreement) relations, and the *Minimal Link Condition* (MLC), which can be viewed as an intervention constraint on matching processes, correspond to independent requirements and shouldn't be collapsed. If non-local *Agree* is an option, the following scenario can be contemplated for long-distance resumptive dependencies: a matching relation is tentatively established between the RP and each of the Cs that c-command it, starting from the lowest one; the search process stops when a matching pair can be constructed between the [i-var, u-φ] pronoun and an [i-λ, u-var] C, making *Agree* possible. In other words, Search can cover chunks of structure that are larger than phasal units, but it proceeds phase by phase, from the smallest one to the largest ones.

This analysis relies on the claim that the lower C is exactly what it appears to be, namely the affirmative declarative subordinating complementizer. This claim can be supported empirically. As shown by (33), it is possible to infix a clitic to C in resumptive relatives. Whatever the explanation for this phenomenon, this option is excluded in embedded declarative clauses.[33] And it is also excluded in embedded declaratives containing a RP:

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33. This asymmetry could indicate that the licensing of C-infixed pronouns requires the presence of an operator or of a [λ] feature in the local CP system.

(37) a. *Gwn y 'i gwelodd Wyn
I know *y* CL.3SG saw Wyn
[compare: Gwn y gwelodd Wyn ef]
b. *y dyn y dywedodd Mair y 'i rhoddais (ef) iddo
the man *y* said Mair *y* CL.3sg I gave it to.3SG M
[meaning: the man to whom Mair said that I gave it]

Examples (33) and (37) indicate that all the occurrences of *y* in long-distance resumptive dependencies do not have the same feature endowment. The lower C's in multi-embedding structures are just declarative C heads, introducing selected clauses. They do not carry the feature [i-λ], because they have an argumental status. They shouldn't carry any uninterpretable [var] feature, either, that could be valued by the RP.

The *non-local Agree* strategy amounts to assigning to the intermediate declarative complementizers the status of defective probes, unable to satisfy the requirement of the pronominal goal, but not preventing the establishment of a relation with a higher head endowed with the appropriate features, namely the resumptive complementizer.[34] What makes this analysis accessible is the idea that *Agree* doesn't obey the PIC, but is intervention-sensitive.[35] On the contrary, the operation *Move*, involved in the derivation of gap relatives, is constrained by the PIC. Example (30a) trivially satisfies this condition.

The *non-local Agree* analysis, combined with principles (28) and (29), reduces the domain relevant to gap and resumptive A′-dependencies to theoretical constructs that are relevant to many other phenomena in the minimalist approach: *Agree*, the MLC and phases. Second, it predicts that, in the general case, RPs are found in positions where gaps cannot appear. More than one phase is involved in resumptive dependencies, whereas movement dependencies are internal to a single phase. This result is achieved without comparing derivations. A third advantage of the narrow-syntactic approach to resumption is that just *via* the inspection of the

34. A slightly different way to look at the problem consists in claiming that a less specified head doesn't qualify as an intervener with respect to the relation between a more specified head and a goal. Rizzi (2013) proposes to account for (a subset of) *wh*-island effects in these terms, with Minimality relativized to features. If *Agree* is involved in the relevant constructions, it is not phase-bound.

35. In the analysis sketched here, "intervention" must not be understood in linear (c-command) terms, but refers to the successive accessibility of elements in a derivational process. The resumptive configurations in which a clitic is affixed to each verb-noun on the resumptive path (cf. (12c)) should be reconsidered in this perspective. In the dialect under consideration, the intermediate clitics can be viewed as reflexes of the successive *matching* relations tentatively established between the RP (the lowest pronoun) and the intermediate phasal heads. *Agree* only takes place when a [i-λ, u-var] C is found. The intermediate clitics are not agreement markers since the intervening verbo-nominal heads are endowed neither with [i-λ], nor with [u-var].

features it is endowed with can it be determined at the first phase whether a given pronoun needs to be bound or not. Recall that the φ features of RPs are uninterpretable, contrary to those of non-resumptive pronouns.

3.5 Extension to other Welsh relative types

This section briefly considers two situations in which the particle introducing a relative clause is not the one that is expected.[36]

3.5.1 *Adjunct relatives*

Contrary to what has been claimed so far, the morphological distinction between the movement complementizer *a* and the resumptive complementizer *y* is in part orthogonal to the gap/resumption divide. The anomalous relatives considered in Section 3.5.2 show that *a* sometimes coexists with a pronominal element. Conversely, the complementizer *y* can coexist with a gap. This is the case in the adjunct relatives exemplified in (38).

(38) a. Dyma 'r unig dro y gwelais ef [__]
here is the unique occasion *y* I saw him
'It is the unique occasion when I saw him.'

b. Dyma 'r unig dro y cofia Siôn iddo
here is the unique occasion *y* remembers Siôn to.3SG.M
'i weld [__]
CL.3SG.M see
'It is the unique occasion in which Siôn remembers seeing him.'

These constructions are gap structures (cf. (38a)), which can be long-distance provided that no island boundary intervenes between the gap and the relative complementizer (cf. (38b)). This suggests that movement is involved in their derivation. In this use, *y/yr* would differ from *a* in that the [var] feature identifying the variable is not D, but another one still to be characterized. If *Move* is involved in (38a), it must be concluded that [$_C$ *y*] doesn't exclusively head resumptive structures and that the *a*/*y* divide cannot be taken to reflect the difference between the situations in which SpecCP is filled by movement and those where the merger of an operator *in situ* is involved.[37]

---

36. Negative relatives raise specific problems which are not considered here.

37. Chomsky (2008) takes advantage of the partially similar Irish data and McCloskey's (2002) contribution to argue that the form taken by the complementizer (in Irish) exclusively depends on the way the corresponding specifier is formed, by *Internal Merge* (in movement structures) or by *External Merge* (in resumptive structures).

This conclusion can be avoided if one assumes that (38a) is a concealed resumptive structure, in which a null pronominal occupies the relativization site.[38] Cinque (1990) observes that certain peripheral constituents (*wh*-phrases, topics…) can be directly base-generated in their surface position and bind a null resumptive, instead of being moved up the tree, an analysis particularly well-suited to the dependencies involving "extracted" adjuncts since, in this case, overt resumptives are generally lacking. At the same time, if the dependencies involving a null resumptive were based on binding, we would wrongly predict that they should not exhibit island effects. But it was shown in the preceding subsections that binding is not the mechanism responsible for the linking of RPs to the periphery and that resumptive dependencies in Welsh obey subjacency. The *resumptive pro* analysis explains both the well-formedness of (38a) and (38b) and the ungrammaticality of the dependencies crossing an island boundary. It is also compatible with the idea that *y* is resorted to when a null operator is merged at the C level. A single additional assumption is necessary for this analysis to work: the adjunct position inside the relative must be vP-internal (recall that the minimal phase containing a RP cannot be the relative CP).[39]

In conclusion, (38a) and (38b) should be analyzed as resumptive structures. The adjunct complementizer is just the resumptive complementizer, specified as in (24).

3.5.2 *Anomalous relatives*

The relevance of argumenthood to the characterization of *a* is confirmed by a subset of the relative structures which Awbery (1977) groups under the rubric "anomalous relatives". The relativized noun phrase is a prepositional object in (39a), a possessive in (40a). The expected pattern in this case is the resumptive one, combining the complementizer *y* with a pronominal element, an agreement marker in (39b), a possessive clitic in (40b). But the "movement" complementizer *a* is also a possibility, as shown by (39a) and (40a). In this case, *a* doesn't cooccur with a gap.

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38. Languages vary at to the possibility of having null RPs in adjunct or argument positions, cf. Salzmann (2009) for discussion. Note that adjunct relatives are not the only context in Welsh where a null RP must be postulated. As observed by Huy Linh Dao, the account developed here forces the conclusion that the interrogative construction (7a) is a resumptive structure including a silent RP linked to the complementizer *y* and bound by prepositional *wh*P merged with it. In this respect, it differs from (8), which is a movement structure.

39. On the contrary, if movement was involved, it would be necessary to assume that the relativized adjunct position is a site external to vP.

(39) a. y dyn a ddisgwyliwn amdan***o*** [__]
the man *a* I waited for.3SG.M
'the man for whom I was waiting'
b. y dyn y disgwyliwn amdan***o*** [__]
the man *y* I waited for.3SG.M

(40) a. y dyn a brynais ***ei*** dŷ [__]
the man *a* I bought CL.3SG.M house
'the man whose house I bought'
b. y dyn y prynais ***ei*** dŷ [__]
the man *y* I bought CL.3SG.M house

These configurations display the properties of both gap and resumptive relatives. Whatever the correct analysis of (39a) and (40a), the fact that the relativized element has an argument status (indirect object or possessive) probably plays a role, as well as the fact that the verb of the relative clause is transitive, as Awbery (1977: 201) observes.

The anomalous relatives exemplified in (39a) and (40a) might provide indirect support for the cyclic Spell-Out hypothesis. Suppose that the PP in (39a) and the DP in (40a) can be characterized as derivational phases. This means that they can be merged and linearized separately from the rest of the structure. If one adopts the cyclic Spell-Out hypothesis, this results in their early spell-out. Lasnik and Uriagereka (2005: 94) suggest that a spelled out structure is not deleted or erased, but "continues its derivational life as a giant compound", whose parts are no longer accessible. This proposal can be interpreted as meaning that what the system "sees" at the next phase is a null element in object position (recall Awbery's observation). This could explain why, under very specific conditions, *a* can be used in place of the expected *y*. This proposal is no more than a speculation for the moment.

4. The subjacency puzzle

It would be useful at this point to compare the properties of Welsh resumptive dependencies with those of another productively resumptive language, namely Irish. This means setting out for a study in microvariation, since the two languages, which belong to different branches of the same family, share many features. This is done in some detail in Rouveret (2017: Chapter 9), relying heavily on McCloskey's foundational work on resumption and movement in Irish relative clauses, see in particular McCloskey (1979), (1990), (2001), (2002). It turns out that the gap-resumption divide can also be accommodated in purely derivational terms in this language and straighforwardly follows from the PIC and from the theory of probe-goal relations,

once it is assumed that *Agree* can apply non locally. The microvariation between the two languages concerning long distance dependencies should be traced back to lexical differences in the feature endowments of the various complementizer particles, which severely restrict the range of available options. It thus supports the Borer-Chomsky thesis that parametric variation is located in the properties of functional heads and functional items.[40]

One aspect of resumptive dependencies that does not seem to be directly related to the feature make-up of complementizers in Irish and Welsh concerns their sensitivity to subjacency. In the two languages, these dependencies are allowed to cross complement clause boundaries and also, to a large extent, weak-island boundaries. But only in Irish can they freely cross strong-island boundaries. McCloskey provides the following examples:

(41) a. ne dánta sin nach bhfuil fhios againn cén áit ar
the poems these C.NEG is knowledge at.1PL what place C
cumadh ***iad***
composed they
'those poems that we do not know where they were composed'

b. Sin teanga a mbeadh meas agam ar duine ar bith a ta
that language *aN* would be respect at.1SG on person any *aL* is
abalta í a labhairt.
able it to speak
'That's a language that I would respect anyone who could speak it.

c. daoine… nár labhair éinne a bhain ***leo*** Gaelige
people… C.NEG.PAST spoke anyone *aL* took with.3PL Irish
'people… that noone who was connected with them ever spoke Irish'

(41a), from McCloskey (1990), exemplifies a case of relativization into a *wh*-clause. (41b) and (41c), from McCloskey (1979), show that it is possible to relativize into a complex DP as long as the relativization site hosts a pronoun. The fact that the pronouns functioning as RPs in (41b) and (41c) are "weak pronouns" doesn't block the establishment of the dependency.[41]

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40. Dealing with Arabic dialects, Hebrew and Irish, Shlonsky (1992) argues that the languages in which RPs freely alternate with gaps in some positions cease to be problematic for the last resort view of resumption once the properties of the complementizers involved in each construction are taken into account. In Irish, the movement complementizer *aL* and the resumptive one *aN* are clearly distinct items, cf. (42a) and (42b). Things are less simple in Hebrew and in the Arabic dialects he studies, where the complementizers involved are strictly identical.

41. The prepositional pronoun *leo* in (41c) can be considered as a weak pronoun, which like other weak pronouns can be strengthened by the adjunction of an emphatic clitic or of *féin*.

In Welsh, weak islands are not absolute barriers to operator-RP relations (cf. (10)), but strong islands are (cf. (9)). Neither independent pronouns ((9a)), nor dependent prefixed pronouns or inflectional markers ((9b)) can be used resumptively in this context. Native speakers do accept long distance relative, interrogative and dislocated structures in which a pronominal variable is contained within a strong island. But the pronominal forms occurring in these contexts differ from the ones found when the dependency does not cross any island boundary. In strong-island contexts, the relativized positions doubled by an inflectional marker or a prefixed pronoun (cf. (9c)) are filled by a suffixed pronoun, referred to as an "auxiliary pronoun" or an "echo pronoun" in traditional grammars. These pronouns occur freely in non-binding environments and don't necessarily carry an emphatic value.

(42) gennyf ***fi*** by-1sg me 'by me'
bûm ***i*** be.PRES.PERF.1SG I 'I have been'
ei frawd ***ef*** CL.3SG.M brother him 'his brother'
eu hathro ***hwy*** CL.3PL teacher them 'their teacher'

Auxiliary pronouns are strictly excluded from resumptive contexts. The doubled position in (43a) and (43b) cannot contain an auxiliary pronoun, which confirms that we are dealing with resumption in this case. The same conclusion holds for multi-clausal dependencies, cf. (43c).

(43) a. *y dyn y soniais amdan***o** **ef**
the man *y* I talked about.3SG.M him
b. *y dyn yr oedd ***ei*** fam **ef** gartref
the man *y* was CL.3SG.M mother him at home
c. *y dyn y gwn y soniais amdano **ef**
the man *y* I know *y* I talked about.3SG.M him

But they are mandatory in strong-island contexts, when a doubled argument position is involved.[42] An auxiliary pronoun occupies the prepositional object position in (44a) and (44b).

(44) a. Y llun o 'r ferch 'dych chi 'n nabod y
the picture of the daughter aren't you PROG know.VN the
person y siaradodd pob tad iddo amdan***o*** ***fe***.
person *y* talked each father to.3SG.M about.3SG.M him
'The picture of his daughter, you don't know the person to whom each father talked about it.'

42. The asymmetry between resumptive and intrusive dependencies is only observed in doubling contexts. In non-doubling contexts (object position in a VSO structure, object position of an uninflected preposition), an independent pronoun doesn't suffice to redeem the subjacency violation, cf. (9a).

b. Pa lun o 'r ferch 'dych chi 'n nabod y
which picture of the daughter aren't you PROG know.VN the
person y siaradodd pob tad iddo amdan***o*** ***fe***?
person *y* talk each father to.3SG.M about.3SG.M him
'Which picture of his daughter don't you know why each father talked about?'

In other words, the insertion of an auxiliary pronoun in the relativized site when a doubling configuration is involved redeems the potential subjacency violation. Auxiliary pronouns optionally occur in weak-island contexts. In (45a) and (45b), an auxiliary pronoun can occupy the object position of the verb-noun doubled by the prefixed clitic.

(45) a. Mae gan Siôn farn ar ei lyfr 'dych chi 'n gwybod
is with Siôn opinion on his book aren't you PROG know.VN
pam mae pob awdur yn ei pharchu (***e***)
why is each author PROG CL.3SG.F respect.VN her
'Siôn has an opinion on his book that you don't know why each author respects.'

b. Pa lun o 'r ferch 'dych chi 'n gwybod pam y
which picture of the daughter aren't you PROG know.VN why *y*
mae pob tad yn ***ei*** ddangos (***e***)?
is each father PROG CL.3SG.M show.VN him
'Which picture of his daughter don't you know why each father shows it?'

It wouldn't be legitimate to distinguish two types of pronouns in function of their sensitivity to islands. I would rather say that the resumptive and the intrusive uses are morphologically distinguished in Welsh in some environments: the combinations involving an auxiliary pronoun have an *intrusive* use, but are never resorted to in *resumptive* structures; conversely, independent and prefixed pronouns, suffixed inflectional markers cannot occur by themselves in strong-island contexts. As for Irish, the correct generalization at a descriptive level seems to be that the same pronominal forms endorse both the resumptive and the intrusive function. A brief survey of the literature on resumption confirms that the Irish situation, in which the same pronouns endorse both functions, represents the general case.[43]

It would be desirable to relate the subjacency behavior of each language to some of its other properties. But the enterprise turns out to be an arduous one. Dealing

43. Hebrew (cf. Borer 1984) displays the same behavior as Irish. In Lebanese Arabic (cf. Aoun, Choueiri and Hornstein 2001) and Jordanian Arabic (Guilliot and Malkawi 2006, 2007), both weak and strong pronouns can be found in islands, but they display different reconstruction and interpretive properties.

specifically with Irish, McCloskey (1990) discusses and rejects the possibility that a connection exist between the productive use of RPs (that is, of pronouns functioning as variables) and the fact that subjacency doesn't seem to be observed. Dealing with colloquial Welsh, Borsley (2013) rightly observes that the sensitivity of resumptive dependencies to subjacency is just another way in which gaps and pronouns are "very similar" and concludes that gap and resumptive structures should be endorsed by the same mechanism.

The contrast between the two languages could also, in one way or another, reflect a difference in their pronominal systems and in the pronominal resources they have at their disposal. One observes that Irish weak pronouns can be strengthened by the adjunction of an emphatic clitic or of *féin*, but that no combination similar to the complex prefixed pronoun (or inflectional marker) + auxiliary pronoun exists in this language. The subjacency behavior of resumptive dependencies in Irish clearly cannot be directly linked to the absence of constructions involving auxiliary pronouns. Breton, which has auxiliary pronouns at its disposal, doesn't display the sensitivity to subjacency that Welsh does. A more sophisticated explanation of the Irish/Welsh contrast, which traces it back to a difference in the internal structures of pronouns, has been proposed by Adger (2011). In Irish, they have a participant specification, D [+ definite], functioning as a local binder, which makes possible the non-local binding of the resumptive. In Welsh, the resumptive is not a definite description, no D being present; as a consequence, the RP must be locally bound by an external element.

A different way to look at the problem would be to ask what kind of evidence Welsh children are exposed to, which leads them to conclude that derivations in their mother tongue obey a very strong cyclicity condition on derivations. The systematic phase-boundedness of *Agree* would provide such a clue. Unfortunately, the available evidence is ambiguous. The pattern observed in long-distance resumptive dependencies could be analyzed both ways – *via* unbounded *Agree* or *via* local *Agree* (if the existence of *y… y…* sequences is interpreted as an indication that resumptive dependencies involve a kind of complementizer chain). A similar situation holds for *wh*-island constructions. In the latter, *Agree* can apply non locally – this is the case when no auxiliary pronoun is present in the relativization site –, or not apply at all – when an auxiliary pronoun is present.[44] I will leave these suggestions and speculations aside for the moment.

44. The situation is different in Irish long-distance dependencies where the contrast between the movement pattern – which displays *aL*-complementizer chains – and the (unmarked) resumptive pattern *aN … goN … goN …* can be taken to indicate that the PIC is relevant in the first case, irrelevant in the second.

The next step is to specify how *intrusive* pronouns are linked to their antecedent. The asymmetry between (43) and (44)–(45) strongly suggests that the relation involved in intrusive dependencies and the one involved in resumptive ones are different in nature and established *via* different routes. In Welsh resumptive dependencies, the relation is defined in the narrow-syntactic derivation, via *Agree*; in intrusive dependencies, it is defined in the semantic component, *via* binding in a post-syntactic rebuilt Logical Form. In resumptive dependencies, the establishment of a probe-goal *Agree* relation is imposed by the fact that both the RP and the resumptive complementizer are endowed with uninterpretable features that need to be valued and deleted. This type of relation is typically built in the narrow syntax. In Welsh, only the least specified pronominal forms can participate in this relation – independent (but not reduplicated) pronouns, prefixed (but not doubling) pronouns, inflectional markers – which suggests that only these forms can bear an uninterpretable [φ] feature and occur in resumptive dependencies. On the contrary, nothing forces a combination involving an auxiliary pronoun to be bound. In intrusive structures, binding must occur because the null operator merged with the highest complementizer needs to bind a variable. This account in part explains why, contrary to RPs, which do not necessarily agree in φ-features with their antecedent (cf. Sections 2 and 3), the pronouns functioning as intrusive elements systematically do: their [φ] features are interpretable and interpreted. I will tentatively assume that the binding of resumptive pronouns and the binding of intrusive pronouns in Irish – where the latter are not morphologically distinguished from the former – also involve two different mechanisms, narrow-syntactic agreement and semantic binding.

As a final observation, note that the contrast between strong and weak islands concerning subjacency effects is expected under the present analysis.[45] With respect to strong-island effects, one can adopt Uriagereka's (1999) claim that the strong islandhood of a constituent is related to its having undergone early/independent Spell-Out. This claim itself can be derived from two assumptions: (i) *Agree* is unbounded, but blocked by strong island boundaries, (ii) *Agree* and *Transfer* occur simultaneously. For the derivation of a structure containing a strong island to converge, it is necessary that all the uninterpretable features internal to the island be valued (*via Agree*) at the time when *Transfer* occurs. This condition is not fulfilled if a RP contained in an island is not syntactically bound within this island. Weak-island boundaries, on the contrary, do not block *Agree*. The relevant relation is exclusively constrained by the MLC. A plausible claim is that *Transfer* occurs in the relevant *wh*-island structures only when the probe-goal *Agree* relation involving

45. Recall that the occurrence of the auxiliary pronoun is optional in weak island constructions, which confirms that a subset of them displays the properties of resumptive structures.

the highest *wh*-phrase takes place. The fact that an auxiliary pronoun can also be present indicates that *wh*-island structures can also be analyzed as strong islands, whose boundaries block *Agree*.

5. Semantic aspects of resumption[46]

In Section 3, it was shown that the linking of RPs to the periphery in Welsh is achieved in the narrow syntax, *via* narrow-syntactic operations (probe-goal relations, *Agree*), obeying narrow-syntactic principles and constraints (derivation by phase, the *MLC*). This syntactic account says nothing about the semantic properties of resumptive dependencies. The aim of Sections 5 and 6 is to show that what matters for interpretation is just RPs being pronominal entities, their derivational origin being simply irrelevant. Moreover, there is every reason to believe that RPs are interpreted late, maybe at a post-LF derivational stage.

5.1 Internal syntax of personal pronouns

Up to now, RPs have been conceived of as simple unanalyzable units. This section discusses the possibility that, in some of their uses, personal pronouns, might be endowed with an internal structure. It is shown that this extra possibility holds the key to a proper understanding of reconstruction phenomena in resumptive structures.[47]

Research on the semantics of personal pronouns has shown that, in some of their occurrences, they behave semantically as "hidden"/"disguised" definite descriptions, cf. Evans (1980), Heim and Kratzer (1998), Elbourne (2001), Fox (2002), Sauerland (2000, 2008), Kratzer (2009), Johnson (2011). According to Sauerland (2000, 2008), bound variable pronouns *can be* hidden definite descriptions (they undoubtedly are when focused), but *need not be*. The claim put forth in this subsection, which will be further substantiated in 6.2, is that the syntactic duality of pronominal expressions underlies their reconstruction behavior.

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46. The simple-minded analysis of reconstruction effects in relative clauses proposed here doesn't come close to a serious *semantic* treatment of resumptivity. It is only intended as a presentation of the data and of the problems they raise. For semantic approaches to reconstruction in resumptive structures, cf. Doron (1982), Sharvit (1999), Guilliot (2006), Guilliot and Malkawi (2006, 2007), Demirdache and Percus (2011).

47. Besides reconstruction, resumptive dependencies give rise to other interpretive phenomena which are not considered here, cf. Guilliot (2006), Bianchi (2011), Demirdache and Percus (2011).

Suppose we transpose the insight of semanticians in syntactic terms. A run-of-the-mill definite description has the shape in (46).

(46) **Internal structure of definite descriptions**
$[_{DP}$ D [φ NP]]
with φ the number, gender features of the nominal expression,
with NP = N (DP) (PP)[48]

Let us assume that personal pronouns can optionally be inserted into derivations with a nominal component. This leaves four possibilities depending on whether pronouns are analyzed as projections of the category D, as Postal (1966) suggests, or as projections of a φ matrix (cf. Rouveret 1991 among others).[49]

(47) **Internal structure** of definite personal pronouns
a. $[_{DP}\ [_{DP}$ D φ] NP]
b. $[_{DP}$ D φ]
c. $[_{\varphi P}$ φ NP]
d. $[_{\varphi P}$ φ]
with φ the person, number, gender features of the pronominal expression and NP the silent nominal component.

Options (47a) and (47c) and options (47b) and (47d) are difficult to tell apart. Whether they instantiate (47a) or (47b), definite pronouns are headed by a D+φ complex. If one follows the guideline of Kayne's (1994) theory of Antisymmetry, a substructure in which two heads c-command each other, such as (47b), cannot be linearized. This means that, in this case, definite pronouns are necessarily mapped onto D+φ units on the PF side, which makes them undistinguishable from simple φ units. An advantage of the φ analysis of pronouns is that it straightforwardly explains why, in a subset of languages, they can be incorporated into a lexical head (to form inflected verbs or prepositions for example). It should also be recalled that the distribution of *a* vs. *y* crucially depends on the possibility to distinguish D projections from φ projections. I will thus assume that Welsh pronouns, when they are bound, can be analyzed either as (47c) or as (47d): they are φ projections.[50] When

48. [D [φ NP]] is phonologically realized as a sequence D NP, where N and D are marked for number and possibly gender.

49. For alternative syntactic or syntactico-semantic characterizations of pronominal elements, see Freidin and Vergnaud (2001), Déchaine and Wiltschko (2002), Rouveret (1991, 2008: 2011b), Adger (2011), Johnson (2011).

50. It is plausible to assume that pronouns, in their different uses, select different options – this is the line of research followed by Déchaine and Wiltschko (2002). Their description can also vary from language to language.

the extended structure (47c) is selected, the NP component is not pronounced. In the following section, I show that the dual analysis of pronouns (47c)/(47d) opens the way to an analysis of reconstruction effects in resumptive structures.

5.2 A copy approach to reconstruction effects

Sauerland (1998) argues that two derivational scenarios are necessary to account for the interpretive properties of relative clauses, the raising derivation and the matching derivation. This divide is essentially motivated by reconstruction phenomena. He proposes to trace back the presence of anaphor binding and scope reconstruction effects and the absence of Condition C effects in English relative clauses to the structural ambiguity of relative clauses (cf. Bhatt 2002; Aoun and Li 2003 for additional evidence). When raising occurs, anaphoric and variable binding reconstruction effects show up. When the matching analysis is selected, no Principle C effects are expected, since the referential expression that functions as the head of the relative clause is not c-commanded by the material internal to the relative clause. Wishing to preserve the link between reconstruction and movement, some scholars have explored the possibility that resumptive relatives should also be assigned one of two analyses, the raising one and the matching one. Aoun, Choueiri and Hornstein (2001), Boeckx (2003), Bhatt and Iatridou (2012) argue that the presence/absence of reconstruction phenomena in resumptive relatives can be explained by the structural ambiguity of these constructions. Cecchetto (2005) however insists that only if it gives rise to all the reconstruction effects – Principle C, variable binding, anaphoric binding –, can it be safely concluded that a given structure is derived *via* movement. A different solution must be looked for when the various reconstruction effects are dissociated. This is exactly the situation in Welsh resumptive relatives. The position argued for in this section is that, whatever the correct derivation of resumptive relatives, the presence or absence of reconstruction effects should be traced back to the internal structure of the pronouns they contain. Let us consider the relevant data more closely.[51]

Resumptive dependencies in non-island contexts sometimes allow reconstruction in the resumptive site and sometimes do not. More precisely, they usually display scope and binding reconstruction effects, but no Principle C effect under reconstruction.

Resumptive dependencies display scope reconstruction effects.

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51. I have previously discussed reconstruction phenomena in Welsh relative clauses in various places (cf. Rouveret 2002, 2008). The analysis presented here only differs from the previous ones on minor points.

(48) Mae gan Siôn farn ar ei lyfr y mae pob awdur yn
Is with Siôn opinion about his book *y* is each author PROG
ei pharchu.
it respect.VN
'Siôn has an opinion of his book that each author respects.'

The quantifier (*pob*) internal to the relative clause takes scope over the pronoun (*ei*) contained in the nominal antecedent (*farn ar ei lyfr*), although the pronoun is not in the c-command domain of the quantifier on the surface. I will assume that the head of the relative clause "(an) opinion of his book" is represented at LF in the resumptive site.[52]

Resumptive dependencies also display binding reconstruction effects.

(49) Fe'm hysbyswyd am y clecs amdano ei hun y mae
PRT me report.PAST.IMP about the gossips about.3SG.M himself *y* is
Siôn wedi ***eu*** clywed yn y cyfarfod.
Siôn PERF CL.3PL hear.VN at the party
'They reported to me the gossips about himself that Siôn heard at the party.'

The anaphoric expression (*ei hun* "himself") contained in the antecedent of the resumptive relative clause (*y clecs amdano ei hun* "the gossips about himself") can be interpreted as a variable bound by the embedded subject argument (*Siôn*), although it is not c-commanded by the subject at Spell-Out. This suggests that the head of the relative "(the) gossips about himself" is represented at LF in the resumptive site.

No "Principle C effect under reconstruction" can be observed in resumptive structures, cf. (50a), (50b). In this respect, Welsh resumptive relatives differ from Welsh gap relatives, where Principle C effects do occur, cf. (50c).

(50) a. Yn ddiweddar, dygwyd darlun$_j$ o Siôn$_i$ yr oedd$_i$ ef yn
recently steal.PAST.IMP picture of Siôn *y* was he PRED
falch iawn ohono*o* *pro*$_j$.
proud very of.3SG.M
'Recently was stolen a picture of Siôn of which he was very proud.'

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52. In Chomsky (2004, 2008), LF is not a level of representation, nor an interface object anymore. This follows in part from the adoption of the cyclic *Spell-Out* hypothesis and in part from the decision to define the output SEM of the semantic component Σ as the only linguistically significant level, because it interfaces with the C-I system. The narrow-syntactic covert operations, which, in previous treatments, were part of LF, now take place in a post-*Spell-Out* syntactic component. Purely semantic processes, not reducible to narrow-syntactic operations, are now included in the semantic component Σ. Since there is some obscurity surrounding this matter, I will continue to use the label LF to refer to the post-*Transfer* level of representation on the semantic side.

b. Yn ddiweddar, dygwyd darlun$_j$ o Siôn$_i$ y gwyddai Gwen y
recently steal.PAST.IMP picture of Siôn *y* knew Gwen *y*
rhoddasai *pro*$_i$ *ef*$_j$ i Mair.
give.PLPERF.3SG it to Mair
'Recently was stolen a picture of Siôn that Gwen knew that he had given to Mair.'

c. Yn ddiweddar, dygwyd darlun$_j$ o Siôn$_i$ a roddasai *pro*$_{*i}$
recently steal.PAST.IMP picture of Siôn *a* give.PLPERF.3SG
[__]$_j$ i Mair.
to Mair
'Recently was stolen a picture of Siôn which he had given to Mair.'

In (50a), the construal of *ef* occupying the relative subject position as coreferent to *Siôn* is legitimate. Idem for the construal of the subject *pro* of *rhoddasai* as coreferent to *Siôn* in (50b). If the antecedent was fully reconstructed into the variable position – occupied by *pro* in (50a) and by *ef* in (50b) –, a Principle C violation should arise, as in the movement relative (50c). The contrast between (50a, b) and (50c) indeed provides initial motivation for assigning different derivations to *a*-relatives and to *y*-relatives. But (48) and (49) show that some (but not all) reconstruction effects are available in *y*-relatives. It is doubtful that a single derivational asymmetry – movement vs. non-movement – be in a position to capture all the relevant distinctions – between gap and resumptive relatives and between different types of reconstruction effects.

I will follow a different route and claim that a proper account of the reconstruction properties of resumptive structures requires that two distinct representations be assigned to pronominal expressions. The resumptive relatives that give rise to scope and binding reconstruction effects force the conclusion that, at the point where semantic interpretation occurs, the pronominal expression has an extended internal structure, including a nominal restriction. Conversely, the ones which do not manifest Principle C effects under reconstruction clearly favor a reduced pronominal structure. I will defend the view that, whenever interpretation requires the full NP component to be active, the extended structure must be chosen. This holds for binding reconstruction (cf. (49)) and scope reconstruction (cf. (48)). Representation (51) correctly predicts the availability of reconstruction in (48).

(51) *ei* ("it") = [$_{\varphi P}$ φ [opinion on [$_{DP}$ D φ author] book]]

But an extended representation cannot be the structure involved in (50a) and (50b), where no Principle C violation is observed. In this case, the minimal structure must be selected. For (50a), the two possible options are (52a) and (52b), but only (52a) correctly predicts the absence of "Principle C effect under reconstruction".

(52) a. *ohono* ("of it") = [$_{\varphi P}$ φ (masc, sg, 3rd)]
b. *ohono* ("of it") = [$_{\varphi P}$ φ [$_{NP}$ picture of [D Siôn]]]

If one accepts the view that pronouns can come in two different shapes, a major question arises: at which derivational level is the distinction between the two types of pronominal structures accessible? Several possibilities can be explored.

i. Pronouns display the extended structure all along the overt syntactic derivation and differentiate themselves only after *Transfer*, on the semantic side. The NP constituent is then deleted or maintained if necessary.
ii. Pronouns reduce to [φ] in the overt syntax and integrate a copy of the NP after *Transfer* only, along the lines of what happens in elided structures according to Williams (1977).
iii. Pronouns are merged into derivations either as extended forms ((47c)) or as reduced forms ((47d)). The distinction is avallable in the narrow syntax.

If the extended form is taken to be the basic one (option i), the derivation of all relative clauses will potentially resort to the raising analysis, a desirable conclusion if one wishes to maintain the correlation between movement and reconstruction. The problem is that the extended form is also compatible with a matching derivation of resumptive relatives. Moreover, if one takes the absence of reconstruction effects to correspond to the default case, it is difficult to understand why the reduced form, which is the pronominal form involved in this case, is the derived one, not the basic one.

Different problems arise if the reduced form is taken to be the basic form (option ii). In this case, the stranding analysis of resumption is not even a possibility. The only *syntactic* operation involved is *Agree*. A copying operation necessarily takes place at LF. This in itself is not problematic since, in the view defended here, reconstruction is tied up with the presence of a "copy" of some type in the argument position, not specifically to movement.[53] This copying operation is highly suspect, however, since it is strictly equivalent to the standard reconstruction operation the copy theory of movement intends to eliminate. Is a copy operation necessary after all? Note that developing a coherent account of how the NP part is deleted (option i) or copied (option ii) at LF could turn out to be an arduous enterprise.

These considerations seem to favor an account in which both the extended pronominal form and the reduced one are merged early. This narrow syntactic approach makes it possible to partially bridge the gap between the syntactic derivation of resumptive structures and their interpretive properties. But it encounters a non trivial difficulty, which will remain unsolved: how can the derivation know, prior

53. Cf. Guilliot (2006) and Rouveret (2005, 2008) for different implementations of this idea.

to reaching the putative relevant interface level, what demands will be made there and organize itself accordingly? Some look-ahead is necessarily involved.

Another question should be raised: if one takes for granted that the selection of the extended or reduced pronominal form is made when the pronoun is first merged, on which basis is the choice between the two structures made? It is tempting to assume that a preference favoring the reduced form is involved. This form represents the unmarked case with respect to the extended one, which is resorted to only when necessary for interpretation. I will assume that (53) is part of the grammar of resumption:[54]

(53) **Preference Principle for resumptive structures**
In the unmarked case, given a definite pronoun functioning as a resumptive, only the φ-component of the pronoun is active for interpretive purposes.

(53) provides an elegant and natural way to solve the problem under discussion: the extended form is available in all structures, but, when interpretation is at stake, the NP part can be active or not be.

As a final observation, it should be noted that the proposed analysis is in a position to account for the resurgence of Principle C effects in a subset of structures. Lebeaux (1992) and Fox (2002) have observed that the relative clauses displaying pronominal binding under reconstruction also trigger Principle C violations. The same correlation is found in Lebanese Arabic resumptive relatives (Aoun, Choueiri and Hornstein 2001) and in the Welsh ones (Rouveret 2002).

(54) *barn yr athro$_i$ ar ei mab y gwyr ef$_i$ y mae pob mam
opinion the teacher on her son *y* knows he *y* is each mother
yn ***ei*** pharchu
PROG CL.3SG.F respect
'the teacher's opinion on her son that he knows that each mother respects'

---

54. An alternative approach would consist in taking the insensitivity to principle C as providing a clue about the nature of principle C, rather than specifically about RPs. Freidin and Vergnaud (2001) propose a syntactic interpretation of principle C along these lines. Johnson (2011) develops a semantic proposal in the same spirit, based on (i) and (ii):

(i) The disjoint reference effect triggered by definite descriptions arises because there is a preference for using bound pronouns in thoses cases.
(ii) Minimize Restrictor! (Schlenker 2005)
The NP part of a definite description should be the most minimal in content relative to communicative goals

The restrictor for pronouns being more minimal than the one for definite descriptions, (ii) imposes the selection of a pronoun, whenever possible. But, since pronouns can have two forms, (ii) can also be taken to impose the selection of the reduced form over the extended one, whenever possible.

The reading of (54) where each mother is paired with a different son requires the full representation of the RP. The reading where *he* is construed as coreferent with *the teacher* requires the minimal form of the RP. The ungrammaticality of (54) under the coreferential reading follows straightforwardly.

A word should be said at this point about the pecularities of English *that*-relatives. Some constructions, standardly taken to be derived by movement, do not display Principle C effects under reconstruction. These effects are entirely lacking in English *that*-relatives, a situation which is unexpected in Aoun and Li's (2003) treatment, where these structures are derived through raising. Munn (1994) and Citko (2001) provide interesting solutions to this puzzle. On the other hand, Welsh is not the only language where gap relatives display Principle C effects under reconstruction, cf. (50c). There are many of them: Italian and Norwegian are cases at hand. This situation renders highly suspicious any attempt to resort to the same mechanism to cover all gap structures. It also suggests that one should definitely resist the temptation to explain the absence of Principle C effects in English *that*-relatives and in Welsh resumptive constructions *via* the same mechanisms and devices.[55]

5.3 Reconstruction in islands

Interestingly, intrusive structures display scope reconstruction. Examples like (55) lend further support to Guilliot (2006)'s and Guilliot and Malkawi (2006, 2007)'s claim that reconstruction effects can be observed within islands. In both (44a) and (44b), repeated here as (55a) and (55b), the distributive reading is available, with the quantified expression (*pob tad*) taking scope over the NP part of the dislocated (55a) or interrogative (55b) antecedent.[56]

(55) a. Y llun o 'r ferch 'dych chi 'n nabod y
the picture of the daughter aren't you PROG know.VN the
person y siaradodd pob tad iddo amdan***o*** ***fe.***
person *y* talked each father to.3SG.M about.3SG.M him
'The picture of his daughter, you don't know the person to whom each father talked about it.'

55. For the claim that the derivational origin of RPs is irrelevant to their interpretation to be fully substantiated, it would be necessary to examine the Swedish and Hausa constructions containing RPs which have been argued to be spelled out traces of movement. If movement is involved, we expect the corresponding pronouns to exclusively display the extended structure and the reconstruction effects that are tied up to it. If no principle C effect under reconstruction can be detected, a serious possibility is that we are not dealing with movement structures at all.

56. Recontruction effects can also be detected in examples (45), whether the auxiliary pronoun is present or not.

b. Pa lun o 'r ferch 'dych chi 'n gwybod pam y mae
which picture of the daughter aren't you prog know.VN why y is
pob tad yn ***ei*** ddangos ***e***?
each father prog CL.3SG.M show.VN him
'Which picture of his daughter don't you know why each father shows it?'

There is no way to analyze the dislocated construction (55a) and the interrogative sentence (55b) as movement structures, since a strong island boundary is involved in each case. It must be concluded that reconstruction effects are not necessarily tied up with movement. But if what is usually referred to as syntactic reconstruction is not involved, how is the connectivity effect observed in the relevant structures captured? Bhatt and Iatridou (2012) suggest that it should be derived *via* semantic reconstruction, as explored in treatments by Cresti (1995), Lechner (1998), Rullman (1995), and Sternefeld (2001).[57]

It is worth observing that the distinction between two kinds of reconstruction, the syntactic and the semantic one, and hence, the existence of two distinct sources for reconstruction, are not forced on us by the phenomenon under consideration. An alternative account could be devised, based on the copy approach to reconstruction, i.e. on the claim that pronouns are copies that can be endowed with an extended structure. The relevant assumptions are given in (56).

(56) i. the connection between the elements functioning as pronominal variables and their antecedent can arise in one of two ways, *via* agreement in the narrow syntax or *via* binding in the semantic component;
ii. the establishment of a connection is a necessary condition on reconstruction;
iii. reconstruction itself is exclusively sensitive to the presence of a full "copy" in the variable site.

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57. Sternefeld (2001) proposes the following characterization: semantic reconstruction refers to the interpretation of scope inversion [and anaphoric binding] by semantic methods, namely the mechanisms of λ-abstraction and λ-conversion, whereas syntactic reconstruction refers to the process of moving a constituent back into the position of its trace. Arguments in favor of the existence of semantic reconstruction, as theoretically and empirically distinct from syntactic reconstruction, are strong. For example, semantic reconstruction is the only formal device available allowing the derivation of the equivalent of an E-type interpretation (i.e. of a sloppy reading) in a sentence like (i):

(i) Every man loves his mother, but no woman loves her.

But Sternefeld's (2001) overall conclusion is that "the difference between the two methods is smaller than has been claimed in the literature."

Suppose that intrusive pronouns, just like resumptive ones, can be assigned an extended structure. Scope and binding reconstruction will function along the same lines in resumptive structures and in intrusive structures. The data in (55) can be taken as a sure indication that the extended form of the pronoun is available in intrusive constructions and is required when scope reconstruction is at stake.[58]

At this point, one should ask whether intrusive structures give rise to Principle C effects under reconstruction. The predictions of the copy approach adopted here crucially depend on the internal structure assigned to intrusive pronouns. If intrusive pronouns manifest the same structural duality as resumptive ones and can also be projections of the reduced form, Condition C effects should disappear in intrusive constructions in the same contexts as in resumptive structures. Native speakers, when consulted detect no Principle C effects in (57).

(57) Yn ddiweddar, dygwyd darlun$_j$ o Siôn$_i$ y gwyddai Gwen pam
Recently steal.PAST.IMP picture of Siôn *y* knew Gwen why
rhoddasai *pro*$_i$ *ef*$_j$ i Mair
give.PLPERF.3SG it to Mair
'Recently, a picture of Siôn was stolen which Gwen knew why he had given it to Mair.'

In (57), the subject *pro* of *rhoddasai* can, without violation, be construed as coreferent to *Siôn*, exactly as in (50b). It must be concluded that the reduced form of the pronoun is available in the relevant structures and must be used whenever the extended one is not required to account for scope or binding reconstruction. Looking now at examples involving both a bound variable relation and a potential Principle C violation, we discover that a Principle C effect manifests itself.

(58) a. Adroddiad pa athro ar ei waith y gŵyr ef pam
report which teacher on CL.3SG.M work *y* knows he why
mae pob myfyriwr yn ***ei*** ddisgwyl ***e***?
is each student PROG CL.3SG.M wait.VN it
'Which teacher's report on his work does he know why each student is waiting for?'

b. Barn yr adolygydd ar ei lyfr y gŵyr ef pam mae
opinion the critic on CL.3SG.M book *y* knows he why is
pob ysgrifennwr yn ei pharchu *hi*?
each writer PROG CL.3SG.F respect.VN her
'the critic's opinion on his book that he knows why each writer respects'

58. The binder of the pronominal variable is necessarily a null operator in this case, not a moved NP constituent.

A Principle C violation arises when one tries to interpret *ef* (in the matrix clause) as coreferent to *athro* in (58a) and to *adolygydd* in (58b). The phenomenon is exactly parallel to the one exemplified in (54) and should be explained along the same lines.

If the grammaticality judgments given in (55) and in (57)–(58) can be confirmed, it must be concluded that intrusive pronouns and resumptive pronouns behave alike with respect to scope and binding reconstruction and Principle C reconstruction. This follows if, although the connection between the pronominal form and its antecedent is achieved *via* different strategies in resumptive and in intrusive constructions, what reconstruction phenomena are sensitive to, once the relevant connection has been established, is exclusively the internal structure of the pronoun involved. Although they morphologically differ from RPs, the pronominal complexes used intrusively in Welsh display the same structural duality.

It must be acknowledged that examples (55) and (57) can also be dealt with within the semantic reconstruction approach. A notable feature of semantic reconstruction is that it can successfully handle the situations in which (i) scope and anaphoric binding reconstruction effects are observable, but (ii) no principle C effect under reconstruction can be detected. This is precisely the case here. According to Bhatt and Iatridou (2011), there should be no Condition C violation in examples like (57) because neither syntactic nor semantic reconstruction can put back the relative head into the relative clause. But according to them, there should be no Principle C effect either in examples like (58): "The bound variable reading will be possible due to semantic reconstruction and there will be no Condition C problem because semantic reconstruction cannot cause the head to be interpreted inside the relative anyway." In other words, the semantic reconstruction approach and the copy approach defended here distinguish themselves by the empirical predictions they make with respect to (58).

However, native speakers are somewhat reluctant to provide judgments on the relevant examples. Their insecurity feeling could be traced back to the uncertainty surrounding the proper analysis of intrusive pronouns. In the languages that have several pronominal forms at their disposal, the pronouns used intrusively frequently correspond to the morphologically most complex forms. This characteristic could be reinterpreted in syntactic terms and taken to mean that the pronouns used intrusively are deprived of any reduced form. In this case, the Principle C effect should be observed everywhere. Conversely, for those native speakers (if they exist, which I doubt), who don't have scope and binding reconstruction in intrusive structures, intrusive pronouns could be taken to lack the extended form completely. The presence of the doubled pronoun would prevent the analysis of intrusive pronouns as quasi-definite-descriptions and no Principle C violation would be expected.

6. Conclusion

The picture that emerges from this study confirms the "Janus-like nature" of RPs evoked by McCloskey (2005). The aspects of resumption that concern their status as A′-structures and the relation of RPs with gaps are taken care of in the narrow syntax. The aspects of resumption linked to RPs being pronouns, in particular their reconstruction properties, are endorsed by LF or post-LF mechanisms, which exclusively rely on their having an internal structure. These two aspects are disjoint. The fact that pronouns have an internal structure plays no role in their distribution.[59] The specific way they are linked to the periphery plays no role in their reconstruction properties.

These observations also confirm the correctness of Uriagereka's Blindness Principle, alluded to in the introduction. Welsh resumptive and intrusive pronouns have been shown to have distinct syntactic origins and to be linked to the periphery *via* different mechanisms operating at different derivational levels. But they show largely similar reconstruction properties.

One of the minimal results that can be retained from this study is that the linking of RPs to the periphery in Welsh should be dealt with as a narrow-syntactic phenomenon, not as an interface one. A notion of derivational domain or derivational unit is clearly relevant to resumptive dependencies. I have adopted the characterization of this notion as codified by Chomsky's notion of "phase". But nothing in this chapter hinges on this particular choice. The link between a RP and the resumptive complementizer is established *via* strictly syntax-internal derivational operations. Resumptive linking (as distinct from intrusive binding) reduces to non-local *Agree*. This approach follows the guideline set up by the recent advances in the study of binding phenomena, which characterize anaphoric binding and pronominal binding as core syntactic phenomena.

The second minimal result is that resumptive dependencies give rise to reconstruction effects and that it is the internal structure of the pronouns involved that is exclusively responsible for the various reconstruction options. In the approach defended here, the pronominal element at the tail of a resumptive dependency is a φP-projection including a NP restriction, which can be active for interpretive purposes or not be.

Since pronouns can be assigned an extended structure in some environments, it could be argued that the derivation of a subset of resumptive relatives involves the raising of the NP part. This analytic move is suspect for two reasons. First, the extended structure of pronouns resembles (but is not identical to) that of the

59. But we know that the clitic/agreement+auxiliary pronoun combinations which function as intrusive elements don't have the same distribution as resumptive pronouns.

definite descriptions which function as copy-traces of movement. Second, the relevant information is available whether movement takes place or not, since there is strictly no difference between pronounced and unpronounced copies. What is relevant to reconstruction is not movement *per se*, but the presence of a copy in the relativization site, as first explicitly stated by Guilliot (2006). In other words, the raising analysis is indeed an option in the approach defended here, but it doesn't hold the key to a proper understanding of reconstruction phenomena. Rather, it is the internal structure of the pronouns involved that is responsible for both the possibility of reconstruction and the availability of a raising derivation.

An alternative approach to both resumption and reconstruction is based on a dual analysis of resumptive relatives, the rasing analysis and the matching analysis, parallel to Sauerland's (1998) account of gap relatives.[60] Bhatt and Iatridou (2012) argue that resorting to the dual analysis opens the way to a satisfying account of reconstruction phenomena in resumptive relatives: reconstruction effects are observed in the relative clauses derived *via* raising, they are not observed in matching relatives. This analysis is not without problems, however. First, the raising analysis has originally been devised exclusively to account for the reconstruction effects observed in gap relative clauses (cf. Vergnaud 1974). Unless it can be shown that raising relatives have additional properties besides this one, an analysis resorting to the raising strategy to account for reconstruction effects only has a weak explanatory power.[61] Second, if two analyses of relative clauses are indeed available, a principle governing the selection of one over the other should be defined. Is the matching analysis the "elsewhere" case with respect to the raising analysis? Or is the reverse true?[62] Third, scope and binding reconstruction phenomena can be detected in intrusive structures and in resumptive constructions where movement cannot be involved, such as the relatives formed on a genitive complement or a prepositional object. The fact that reconstruction is available in these contexts indicates that the link between movement and reconstruction should be loosened. This conclusion holds whether semantic reconstruction turns out to be the appropriate device to handle the relevant data or not.

The third result of this study concerns the feature make-up of RPs. RPs are specified positively for a [var] feature, but they differ from ordinary pronouns in bearing

60. As stated in Section 2, only the NP part of the nominal expression is raised in the movement analysis of resumptive constructions, cf. Aoun, Choueiri and Hornstein (2001), Boeckx (2003).

61. This point is fully acknowledged by Sauerland (1998).

62. It could also be argued that the two derivations cannot be compared on an economy basis since they don't have the same numeration. But this objection doesn't hold if pronouns, and in particular, resumptive pronouns, are not items drawn from the lexicon, but objects created during the syntactic derivation, cf. Grolla (2005), Hornstein (2007, 2010), Sichel (2014).

an uninterpretable [φ] feature, which makes them active. A second characteristic of RPs, in Welsh at least, is that they must be A′-free in the minimal derivational unit that contains them. If this conclusion is correct, RPs differ from non-pronominal variables (*wh*-traces), just as non-resumptive pronouns differ from anaphors: ordinary and resumptive pronouns must be locally free; anaphors and variables must be locally bound.

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CHAPTER 5

Causality, comitativity, contrastivity, and selfhood

A view from the left periphery and the *v*P periphery

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When people talk about reflexives, they often think of two arguments in an anaphoric or coargumental relationship. This paper sets out to show that reflexive adverbials also participate in such kind of relationship, but with a far greater range of interpretative possibilities closely associated with their syntactic distributions. The syntax-semantics correspondence strictly observes an inner-outer dichotomy of adverbials observed across languages, i.e., inner Self expresses comitativity, whereas outer Self express causality. Our finding thus lends a substantial support to the cartographic approach advocated by Rizzi (1997) and Cinque (1999). It is also argued that this behavior can be accommodated by a general theory of reflexivity along the line of Reinhart & Reuland (1993), given that a contrastive focus is introduced in accordance with the phase edges (Chomsky 2000, 2001). The "selfhood" can then be understood in a new light, not only in terms of the general theory of syntax-semantics mapping, but also in terms of the "topography" of adverbials, which is by and large determined by their morphological makeups in particular languages.

Human beings model themselves on the earth. The earth models itself
on the heaven. The heaven models itself on the Way.
And the Way models itself on selfhood.
(Lao Tze, *Tao Te Ching*)

0. Introduction

In the past, the literature on how to construe *ziji* 'self' as an argument is abundant, including a number of heated debates (cf. Tang 1989; Huang & Tang 1991; Cole, Hermon & Sung 1990; Cole & Sung 1994; Xu 1993, 1994; Pan 1997; Huang & Liu 2000, among others). On the other hand, the discussion on the adverbial usage of

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ziji is relatively rare (cf. Lü 1980; Tang 1990), let alone a systematic investigation of its nature and origin. Take (1a) for example:[1]

(1) a. Akiu zuotian ziji qu Taibei.
Akiu yesterday self go Taipei
'Akiu went to Taipei by himself yesterday.'
b. Akiu went to Taipei himself yesterday.
c. Akiu himself went to Taipei yesterday.

Since *ziji* is separated from the subject *Akiu* by a temporal adverbial, it has to be an adverbial of some sort, just like its English counterpart in (1b), rather than an adnominal intensifier as in (1c) (cf. Bickerton 1987; Browning 1993; Siemund 2000; König 2001; Gast 2002; Hole 2002; Gast & Siemund 2004, among others). Semantics wise, its anti-comitative reading is akin to *alone* or *by oneself* in English, further differing from the individual identity functional reading associated with adnominal *himself* (cf. Eckardt 2001; Gast 2002; Hole 2005). In fact, Chinese does have a counterpart of the adnominal intensifier, i.e, *ta-ziji* 'him-self' in (2a), which cannot be separated from the subject *Akiu*, as evidenced by (2b,c):

(2) a. Akiu ta-ziji changchang hui qu Taibei.
Akiu him-self often will go Taipei
'Akiu himself went to Taipei yesterday.'
b. *Akiu changchang ta-ziji hui qu Taibei.
Akiu often him-self will go Taipei
c. *Akiu changchang hui ta-ziji qu Taibei.
Akiu often will him-self go Taipei

Moreover, while the focus marker *shi* may scope over adverbial *ziji*, as in (3a), it can never intervene between the subject and adnominal *ta-ziji*, as in (3b):

(3) a. Akiu shi ziji hui qu Taibei.
Akiu Foc self will go Taipei
'It is on his own initiative that Akiu will go to Taipei.'
b. *Akiu shi ta-ziji hui qu Taibei.
Akiu Foc him-self will go Taipei
'It is Akiu himself that will go to Taipei.'

In the following discussion, we will call the type of *ziji* in (1a) a reflexive adverbial, and focus on investigating its syntax and semantics.

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1. The abbreviations used in this paper are glossed as follows: CL: classifier; Foc: focus-marker INC: inchoative aspect; PAST: past tense; PRF: perfective aspect; Prg: progressive aspect; Top: topic marker.

Furthermore, once we look deeper into the distributional properties of adverbial *ziji*, it becomes clear that its interpretation varies with respect to the type of syntactic projections it modifies (cf. Tsai 2002). First compare (4) with (5):

(4) Akiu **ziji** ken chuli zhe-jian shi.
Akiu self willing handle this-CL matter
'Akiu is willing to handle this matter on his own initiative.'

(5) Akiu ken **ziji** chuli zhe-jian shi.
Akiu willing self handle this-CL matter
'Akiu is willing to handle this matter by himself.'

The reflexive adverbial in front of the modal *ken* 'willing' is interpreted as 'on his own initiative', whereas the one following *ken* still means 'by himself'. As a matter of fact, the two sentences have distinct semantics: (4) is true if Akiu is willing to handle this matter without others' persuasion. (5) is true if Akiu is willing to handle this matter without others' company or help. So (4) can be true when (5) is false, as in the scenario where Akiu is willing to handle this matter voluntarily, but he asked for a helping hand. Equally, (5) can be true when (4) is false, as in the scenario where Akiu is willing to handle this matter alone only after someone persuaded him to do so. We will pursue the above intuition as far as we can to account for the contrast between (4) and (5) in both syntactic and semantic terms: In the following discussion, we will call premodal *ziji* an outer reflexive adverbial, and postmodal *ziji* an inner reflexive adverbial. Outer Self thus has the semantic effect of excluding all possible causes or causers except for Akiu himself, resulting in the anti-causal reading of (4), whereas inner Self has the semantic effect of excluding all the possible comitants or benefactors except for Akiu himself, resulting in the anti-comitative reading of (5).

This paper is organized as follows: Section 1 carries out a survey of the distribution and interpretations of Chinese reflexive adverbials, showing that a number of sentential elements may serve to delimit the two types of adverbial *ziji*. In Section 2, we point out a thematic-semantic restriction on the usage of inner reflexive adverbials: Namely, they must have an agentive subject. Section 3 explores the possibility of treating adverbial *ziji* as a special kind of reflexive-marker à la Reinhart & Reuland (1993), which combines the properties from both adnominal intensifiers and anaphors. Specifically, we provide a straightforward account of the subject agentivity by associating inner reflexive adverbials with contrastive foci, which effectively introduces negation over the alternative set of a comitative argument. The "inner selfhood" can thus be decomposed into contrastivity plus comitativity in the *v*P phase. In Section 4, we argue that an implicit causative predicate plays a major role in licensing outer reflexive adverbials, and it is a cause/causer argument that is subject to a variety of construals. Accordingly, the "outer selfhood" is decomposed

into contrastivity plus causality in the IP/CP layer. Section 5 continues to explore some consequences of our proposals in terms of restructuring and grammaticalization, and Section 6 concludes this paper.

1. The delimiting factors

1.1 Modals

There are four groups of sentential elements which may serve to mark the boundary for inner and outer reflexive adverbials. The first group, as mentioned above, consists of all sorts of modals: Premodal *ziji* and postmodal *ziji* behaves rather differently in terms of their semantics and pragmatics. For example, the reflexive adverbial appears before *yinggai* 'should' in (6a), and the reading is 'on one's own initiative'. By contrast, it appears after *yinggai* in (6b), and the reading is 'in person':

(6) a. tamen **ziji** yinggai/bixu chuli zhe-jian shi.
they self should/must handle this-CL matter
'They should/must handle this matter on their own initiative.'
b. tamen yinggai/bixu **ziji** chuli zhe-jian shi.
they should/must self handle this-CL matter
'They should/must handle this matter in person.'

Likewise, when *ziji* precedes the volition modal *yao* 'want', as in (7a), the reading is 'exclusively'; when it follows *yao*, as in (7b), the reading is 'alone':

(7) a. Akiu **ziji** yao shui na-zhang chuang.
Akiu self want sleep that-CL bed
'Akiu wants to sleep on that bed exclusively.'
b. Akiu yao **ziji** shui na-zhang chuang.
Akiu want self sleep that-CL bed
'Akiu wants to sleep on that bed alone.'

To sharpen our intuition, we may attempt to paraphrase (6)–(7) in truth-conditional terms, as given in (8a–d) respectively:

(8) a. (6a) is true if they should/must handle this matter without others' persuasion.
b. (6b) is true if they should/must handle this matter without asking others to do it instead.
c. (7a) is true if Akiu doesn't want others to sleep on that bed.
d. (7b) is true if Akiu doesn't want others to share that bed.

It should be clear at this stage that inner Self and outer Self have distinct domains of modification, which have a profound impact on the way they are interpreted, and strongly recalls Cinque's (1999) view on adverbial projections.

1.2 Negation

The second group comprises negative morphemes such as *bu* 'not' and *mei* 'have not'. Here an emphatic construal becomes available for outer Self (cf. Tang 1990). The emphasis is placed upon oneself vs. others, as in (9a) and (10a). Inner Self, on the other hand, still keeps its anti-comitative reading, as in (9b) and (10b):

(9) a. Akiu ziji bu kai zhe-bu che, ta dou jiegei bieren kai.
Akiu self not drive this-CL car he all lend others drive
'Akiu himself does not drive this car, and always lends it to others.'

b. Akiu bu ziji kai zhe-bu che, you yi-ge siji bang
Akiu not self drive this-CL car have one-CL chauffeur help
ta kai.
him drive
'Akiu does not drive this car personally; there is a chauffeur driving for him.'

(10) a. Akiu zuotian ziji mei jiao qian, you jiao bieren ye
Akiu yesterday self have.not pay money also ask others also
bu yao jiao.
not want pay
'Not only did Akiu himself not pay the money yesterday, but he also asked others not to pay.'

b. Akiu zuotian mei ziji jiao qian, shi jiao biern.
Akiu yesterday have.not self pay money be ask others
dai-jiao de
acting-pay DE
'Yesterday Akiu did not pay the money in person, but asked others to do that for him.'

Also note that outer Self in (9a) cannot be an adnominal intensifier, because it can be easily separated from the subject by a sentential adverbial such as *zuotian* 'yesterday' in (10a).

1.3 Adverbs of quantification

Adverbs of quantification also serve to separate inner *ziji* from outer *ziji*: When *ziji* precedes *changchang* 'often', *henshao* 'seldom', and *congbu* 'never', it gets interpreted as 'on one's own initiative', as evidenced by (11). When *ziji* follows the adverbs of quantification, its reading again shifts to 'in person', as in (12):

(11) tamen ziji changchang/henshao/congbu chuli zhe-zhong shi.
they self often/seldom/never handle this-kind matter
'They often/seldom/never handled this kind of matter on their own initiative.'

(12) tamen changchang/henshao/congbu ziji chuli zhe-zhong shi.
they often/seldom/never self handle this-kind matter
'They often/seldom/never handled this kind of matter in person.'

1.4 Control verbs

The last group has to do with the control structures headed by verbs like *jihua* 'plan', *dasuan* 'intend'. Again, it is 'on one's own initiative' vs. 'alone' in (13), and 'of one's own accord' vs. 'alone' in (14):

(13) a. Akiu ziji jihua qu Taibei.
Akiu self plan go Taipei
'Akiu plans to go to Taipei on his own initiative.'
b. Akiu jihua ziji qu Taibei.
Akiu plan self go Taipei
'Akiu plans to go to Taipei alone.'

(14) a. Akiu ziji dasuan qu Taibei.
Akiu self intend go Taipei
'Akiu intends to go to Taipei of his own accord.'
b. Akiu dasuan ziji qu Taibei.
Akiu intend self go Taipei
'Akiu intends to go to Taipei alone.'

This suggests that the interpretive alternation between the two types of adverbial *ziji* is not restricted to clausemates, but may involve a bi-causal construal.[2]

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2. Another way to look at (13) and (14) is to treat inner Self here as something belonging to a control complement. Questions, however, remain as to why *ziji* in the control clause can only be interpreted as anti-comitative, while its counterpart in the main clause can only be interpreted as anti-causal.

All in all, a systematic distinction does exist between the two types of reflexive adverbials both in terms of syntactic distributions and semantic interpretations. In the following discussion, we will focus on an agentivity requirement on inner *ziji*, which will further set them apart.

2. Subject agentivity

Predicate types have a close bearing on the distribution of Chinese reflexive adverbials: Inner *ziji* is consistently blocked when the subject is not an agent. Take passive and unaccusative sentences for example: Both (15) and (16) lack the inner reflexive readings, i.e., not being able to be interpreted as either 'alone' or 'by oneself':[3]

(15) *passives:*
na-ge xuesheng ziji bei pian-le, hai xiang pian bieren.
that-CL student self BEI cheat-INC still want cheat others
a. 'That student himself was cheated, and he still wants to cheat others.'
b. #'That student alone was cheated, and he still wants to cheat others.'

(16) *unaccusatives:*
wo hai mei zhao, na-ben shu jiu ziji chu-xian le.
I still have.not search that-CL book then self show-up INC
a. 'I have not looked for it yet. Then the book showed up spontaneously.'
b. #'I have not looked for it yet. Then the book showed up alone.'

Likewise, inner *ziji* is also blocked in locative-existential constructions such as (17): The subject is a locative PP, and the reflexive adverbial does not allow the "inner" reading:

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3. An anonymous reviewer points out that inner reflexive adverbial construals can still be spotted in the following passive and unaccusative constructions:

(i) na-ge qiangdao zhi you ziji bei zhua, ta-de tonghuo dou taozou le.
that-CL bandit only have self BEI arrest, his-DE gang all escape INC
'That bandit got arrested alone, and other members of his gang have fled the scene'

(ii) Guole henduo nian, na-ge shizong de shaonian ziji chuxian
After many year, that-CL disappear DE youngster self appear
zai cheng-li.
in city-inside
'After many year, the young man who disappeared long time ago appeared along in the city.'

(17) *locative-existential predicates:*
cong faguo ziji lai-le san-ge gongchengshi.
from France self come-PRF three-CL engineer
a. 'From France came three engineers without invitation.'
b. #'From France came three engineers by themselves.'

Finally, sentient verbs such as *xihuan* 'like' and *ku* 'cry' are incompatible with inner *ziji*, as their subjects are typically sentient beings,[4] as evidenced by the lack of ambiguity in (18) and (19):

(18) *transitive sentient verbs:*
Akiu ziji xihuan hua, jiu guli dajia zhong.
Akiu self like flower then encourage people plant
a. 'Akiu likes flowers out of his own liking. He then encouraged people to plant them.'
b. #'Akiu alone likes flowers. He then encouraged people to plant them.'

(19) *unergative sentient verbs:*
bu zhi zenme de, Akiu ziji ku-le qilai.
not know how DE Akiu self cry-INC up
a. '(I) don't know how (that happened). Akiu started to cry without cause.'
b. #'(I) don't know how (that happened). Akiu started to cry alone.'

By contrast, predicates with an agentive subject allows both the outer *ziji* and inner *ziji* freely, as indicated by the two readings of (20a,b):

(20) bu zhi zenme de, Akiu ziji pao-le chuqu.
not know how DE Akiu self run-INC out
a. '(I) don't know how (that happened). Akiu ran out on his own initiative.'
b. '(I) don't know how (that happened). Akiu ran out by himself.'

4. Within Reinhart's (2000, 2002) theta system, the subject of sentient verbs is classified as [+m] (m: mental state), but underspecified for the c feature (c: cause change). The verbs we pick here do not involve agentivity or a causal relation with their arguments, and their external θ-roles should therefore be specified as [–c, +m], in line with an experiencer.

3. Reflexives of nature

An even more interesting case can be found in unaccusatives with transitive alternates (a.k.a. ergative predicates):[5] Here we need an external force, as in (21), or an physical condition, as in (22), in the context to license outer reflexive adverbials:

(21) feng da-le, men **ziji** hui kai. (outer Self)
wind big-INC door self will open
'When wind becomes stronger, the door naturally will open.'

(22) shijian dao-le, hua **ziji** hui kai. (outer Self)
time due-INC flower self will open
'When the time is due, flowers will blossom by nature.'

The reading shifts to 'by nature' or 'naturally' instead of 'voluntarily' or 'without cause', as illustrated in (21). On the other hand, the inner reflexive construals of (23a,b) are marginal, presumably due to a conflict with the force/condition in the context:

(23) a. ??feng da-le, men hui **ziji** kai. (inner Self)
wind big-INC door will self open
'??When wind becomes stronger, the door will open automatically.'

b. ??shijian dao-le, hua hui **ziji** kai. (inner Self)
time due-INC flower will self open
'??When the time is due, flowers will blossom spontaneously.'

In cases where there is no salient force/condition at work, two things may happen. Firstly, outer Self may bring out spontaneousness, as in the locative-existential construction (24a). By contrast, inner Self is ruled out in the same environment, as evidenced by (24b):[6]

(24) a. meige chitang-li **ziji** dou zhang-chulai yi-zhu liahua.
every pond-in self all grow-come.out one-CL water.lily
'In the pond grew a water lily spontaneously.' (outer Self)

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5. The fact that adverbial *ziji* may take an inanimate subject is first pointed out by Tang (1989), which serves an argument for distinguishing it from genuine anaphors with respect to its "intensifying" function.

6. Here an anonymous reviewer raises an interesting observation that, for some Mandarin speakers, (24b) is valid when interpreted as 'without (extra) care', which is arguably an instance of comitative construals. As far as I can see, this seems to fall under the gray area of grammaticalization from inner Self to outer Self. Namely, the reading actually stands in-between 'without help' and 'without (external) cause'. We may link this spectrum effect further to the "de-agentivization" of the locative subject, which leads to the non-agentive usage of 'without (external) care'.

b. *meige chitang-li dou **ziji** zhang-chulai yi-zhu liahua.
every pond-in all self grow-come.out one-CL water.lily
'In the pond grew a water lily alone.' (inner Self)

Secondly, inner Self may become compatible, producing either an automatic or supernatural reading. The point should be clear by comparing (21) with the following examples:

(25) a. men hui **ziji** kai. (inner Self)
door capable self open
'The door is capable of opening automatically.'
b. men hui **ziji** kai, you gui! (inner Self)
door capable self open have ghost
'The door is capable of opening by itself. There must be a ghost!'

Here the interpretation has shifted from 'by nature' to something related to a built-in mechanism, as in (26a), or to a supernatural cause, as in (26b). Also note that the future modal has changed into one of its cognates, i.e., the capability modal *hui*. One way to look at this puzzle is to say that some sort of agentivity has been ascribed to the inanimate subject, hence the changing of modality. The supernatural reading comes out whenever we cannot provide a reasonable explanation based on our understanding of the nature of the world.

4. A working hypothesis

4.1 Inner self as a focus adverb

A natural question along our line of research concerns what makes reflexive adverbials standing out between adnominal intensifiers and anaphors. Tang (1989) points out that emphatic *ziji* is an adverbial, and should be separated from genuine anaphors in sporting only the "intensifying" function. From an opposing point of view, Jayaseelan (1997) suggests that there is no distinction between anaphoric Self and emphatic Self. The adverbial-like behavior of emphatic Self is attributed to a process akin to quantifier floating, where it is left behind as a focus marker. As a result, there is essentially no semantic distinction between, say, *John himself went to Taipei* and *John went to Taipei himself*. For Jayaseelan, even an anaphor is decomposed into [$_{DP}$ *pro* [$_{D'}$ *himself*]], where the empty pronoun is "protected" from Binding Principle B by its head *himself*. In other words, all anaphors are pronouns in disguise.

Our position is somewhere in-between: We would like to propose that reflexive adverbials combine properties from both adnominal intensifiers and anaphors.

In a nut shell, reflexive adverbials pattern with adnominal intensifiers in sporting a contrastive focus, which may well lead to an emphatic construal on semantic/pragmatic grounds. On the other hand, we believe that there is a strong connection between reflexive adverbials and anaphors, in that they both involve coargumental relations of some sort.

Furthermore, there is a morpho-syntactic distinction between adnominal intensifiers and adverbial reflexives in Chinese. As discussed above, the complex reflexive *ta-ziji* 'him-self' heads an argument DP, specializing in contrasting an individual (i.e., the agentive subject) against possible alternatives, whereas the simplex reflexive *ziji* functions as an adverbial, hence contrasting an eventuality against possible alternatives (cf. Rooth 1985, 1992, among others). For one thing, it is not uncommon for languages to distinguish adnominal intensifiers from reflexive adverbials: As reported by Gast & Siemund (2004), Tetelcingo Nahuatl provides just such an example: *Sie* plus a pronoun serves as an adnominal intensifier associated with *David* in (26a), while *sa… siel* function as an adverbial expressing intensifying construals, as in (26b):

(26) a. pos **sie yaha** David kıhtoa ipa inu libro de Salmos…
well one he David he.says in DET book of psalms
'and David himself saith in the book of Psalms.'

b. **sa i-siel** okıchıhchı i-kal.
only 3.POSS-INT he.built 3.POSS-house
'He built his house himself.'

To implement the duality of reflexive adverbials, first we would like to entertain the possibility of treating adverbial *ziji* as a special kind of reflexive-marker along the line of (27) à la Reinhart & Reuland (1993) (henceforth R & R):

(27) A reflexive predicate must be reflexive-marked.

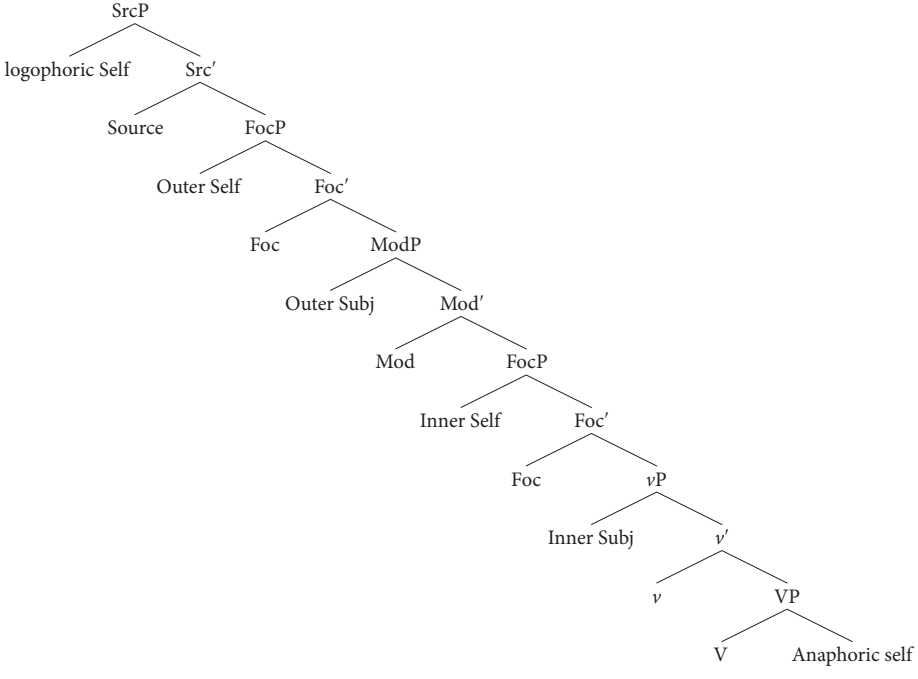
The idea is to treat reflexive adverbials as a SE-anaphor operating on a syntactic level, since *ziji* is a free form rather than a clitic. In terms of syntax, we assume that it is at the edge of *v*P that inner Self serves to reflexive-mark the predicate. By scoping over *v*P instead of V, inner Self associates the subject with a comitative argument instead of the internal argument, due to its extended scope over *v*P. By the same token, the contrastive focus is operating on the *v*P projection, scoping over the alternative set of the comitative argument.

Outer Self, on the other hand, merges to ModP (or other functional projections in the left periphery) as an adjunct, and reflexive-marks the modal projection accordingly. Finally, the object position hosts *ziji* as the coargument of the subject along the line of R & R. In term of semantics, the interpretations of middle Self and outer Self are largely determined by the type of constituent they modify, ranging from 'on one's own initiative' to 'without cause' or even 'by nature'. For inner Self, it

is a *v*P-adjunct and displays the subject agentivity effects. Its interpretation is more or less predictable, i.e., either 'alone' or 'in person'.

In the event that *ziji* merges to a even higher functional projection (presumably in the CP domain), then *ziji* may have been engaged in the role as a logophor. As a matter of fact, an IP-adjunction analysis has already been proposed by Huang & Tang (1991) to deal with the long-distance construals of *ziji*, which is reinterpreted by Huang & Liu (2000) as raising to the Spec of a Source Phrase (SrcP) in the left periphery. Reflexive adverbials, therefore, serve as the missing link between logophors and anaphors in Chinese. It is therefore not surprising that, as apposed to the complex reflexive *ta-ziji* 'him-self', the simplex reflexive *ziji* enjoys a much wider range of distribution and interpretation, presumably due to the robust analyticity of Chinese (cf. Huang 2015). The whole spectrum of the diverse realization of selfhood is illustrated in the following topography of Chinese reflexives:

(28)



Given the above topography, outer Self should be able to co-occur with inner Self and/or anaphoric Self. This prediction is indeed borne out, as evidenced by the following examples:

(29) a. ?Akiu **ziji** yinggai **ziji** chuli **ziji**-de shi.
Akiu self should self handle self-DE business
'Akiu should handle his own business alone on his own initiative.'

b. ?Akiu **ziji** hui **ziji** gei **ziji** guli.
Akiu self will self give self encouragement
'Akiu will willingly give himself encouragement in private.'

We thus map out the distribution Chinese Self in correspondence with its various interpretaitons along the line of Rizzi (1997) and Cinque (1999), not only in the left periphery, but also in the *v*P periphery. This move in turn presents a much clearer picture of how syntax and semantics interact to shape the topography of adverbials in general.

From a cross-linguistic perspective, the inner-outer dichotomy is also attested in German (cf. Siemund 2000; König 2001; Gast 2002; Hole 2005): As illustrated by (30a), *selbst*, an agentive intensifier in Hole's terms, is akin to inner *ziji* with regard to both its distribution and its interpretation, which construal seems to be wide-spread across languages. By contrast, *selbst* of (30b) occupies a location much higher and carries an additive meaning which can be roughly paraphrased as 'The cook, too, has picked blueberries before':

(30) a. Der Koch hat die Blaubeeren **selbst** gepflückt.
the cook has the blueberries himself picked
'The cook has picked the blueberries himself.'
b. Der Koch hat **selbst** schon mal Blaubeeren gepflückt.
the cook has himself already once blueberries picked
'The cook has himself picked blueberries before.'

Although the latter construal of *selbest* (often dubbed as an inclusive intensifier) has no counterpart in Chinese, one may still compare it to outer *ziji* in both syntactic and semantic terms: Both merge to a functional projection in the left periphery, taking a propositional scope as a result, and both involve focus construals of some sort.

4.2 Comitativity and subject agentivity

At first glance, it seems the subject agentivity puzzle may find its solution in argument reduction associated with reflexive-marking. First consider the following reduction constraint proposed by Reinhart & Siloni (2004):

(31) Reduction can only apply to a pair of free θ-roles one of which is external.

In other words, if there is no external argument, then there will be no reduction triggered by inner reflexive adverbials.[7] The constraint thus works well in block-

7. In the long tradition of Marantz (1984), Bouchard (1984), Manzini (1986), Cinque (1988), Grimshaw (1990), Kayne (1988), Pesetsky (1995), and Sportiche (1998), reflexivization is viewed as a process of reducing the external argument, where an internal argument will have to raise to

ing inner Self for passives, unaccusatives, and locative-existential predicates in (15–17). However, sentient predicates of (18) and (19) still present difficulties for this approach: Namely, they do have external arguments, i.e., the Experiencer subjects, but inner Self is ruled out nonetheless. As a result, we must look elsewhere for the solution.

To that end, one may appeal to an observation made by Reinhart (2002), which goes as follows: 'In standard agent verbs….. an instrument is always allowed optionally, but it is not directly selected by the verb. (This is a general entailment licensed by the agent role, which need not be listed for each individual entry.)'. Indeed, this general entailment in presence of an agent verb provides us the basis of formulating the subject agentivity.[8]

Nevertheless, there is still a conceptual gap between an instrumental argument and a comitative argument. As mentioned above, inner Self constructions such as (32) actually allow two types of paraphrases: One is comitative, as in (32a); the other is instrumental, as in (32b):

(32) Akiu ken **ziji** chuli zhe-jian shi.
Akiu willing self handle this-CL matter
a. 'Akiu is willing to handle this matter without others' company.'
b. 'Akiu is willing to handle this matter without others' help.'

One way to think of this issue is to group instrumental and comitative arguments together under a proto-comitant role, which relation is typically expressed by *with* or *by* in English with a variety of interpretations ranging from a comitant to a manner, as shown throughout (33a–c) and (34a–c):

(33) a. Akiu left with his friends. (comitant)
b. Akiu left with a limousine. (instrument)
c. Akiu left with apparent ease. (manner)

(34) a. Akiu stands by his friends. (comitant)
b. Akiu came by the highway. (path, method)
c. Akiu was killed by a knife. (instrument)

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the subject position, in a fashion very similar to unaccusative construals. The "internal" reductionist approach, on the other hand, take reflexivization to be a reduction process of an internal argument (cf. Grimshaw 1982; Wehrli 1986; Reinhart 1997; Chierchia 1989; Reinhart & Siloni 2004; Reinhart 2000, 2002). At this stage, it suffices to assume that the target of reduction is a quasi-argument bearing an optional θ-role (cf. Rizzi 1990).

8. Alternatively, one may follow Gast & Siemund (2004) in taking the instrumental construal to be something metonymical to the agent role, which explains why reflexive adverbials often adopt the "oblique reflexive adjunct" strategy cross-linguistically, i.e., appearing in a PP form as in *Akiu went to Taipei [by himself]*.

A comitant is defined as someone or something which is in a comitative relationship to an event, as in *Akiu went to Taipei with his father*, or *Akiu went to Taipei with his father's money*. Conceptually speaking, the comitant role can easily translate into an instrument role: For instance, *his father's money* can be something Akiu carried with him, or equally something Akiu made use of to get to Taipei. Parsons (1995) defines an instrument role as a relation between an event e and an individual x such that e is with x. We may extend his insight by claiming that a proto-comitant is someone or something in a comitative relation to an event, which can easily translate into an instrumental, path or manner relation. Consequently, there are two facets to our formulation of the agentivity restriction, as stated below:

(35) *Subject Agentivity on Inner Self:*
An agentive subject may license an optional comitative argument, which feeds into the focus construal of inner Self.

This move thus accounts for the incompatibility between inner Self and sentient verbs in (18) and (19) in a straightforward manner: The external argument of *xihuan* 'like' and *ku* 'cry' is not an agent ([+c, +m] in Reinhart's system), but a sentient ([+m]). As a result, they do not allow an optional comitative argument, and inner Self is blocked due to the failure to fulfill (35b).[9]

For one thing, one may wonder whether the optionality really matters here. One phenomenon worthy of investigation has to do with predicates obligatorily selecting a comitative argument, e.g., *jianmian* 'meet' in (36a,b):

(36) a. Akiu zuotian he Xiaodi jianmian.
Akiu yesterday with Xiaodi meet
'Akiu met with Xiaodi yesterday.'
b. *Akiu zuotian jianmian.
Akiu yesterday meet
c. Akiu zuotian **he** **ziji** jianmian.
Akiu yesterday with self meet
'Akiu met with himself yesterday.'
d. *Akiu zuotian **ziji** jianmian.
Akiu yesterday self meet

Reflexivization here is only possible when *ziji* is buried in an comitative PP, as in (36c), a strategy called "oblique reflexive adjunct" by Gast & Siemund (2004). Otherwise inner reflexive adverbials are ruled out, as evidenced by (36d). This is

9. A noteworthy alternative to the agentivity restriction of inner reflexive adverbial has been developed by Hole (2005), where the agentive use of *selbst* 'himself' is taken to an instance of the identity function, syntactically adjoining to Agentive Voice head à la Kratzer (1996). We will not pursue this option here.

fully expected under our formulation since the comitative argument in question is not optional.

For another, one may also wonder whether the notion of "proto-comitant" is really necessary. There are two cases to consider here. Both concern constructions where the external argument is instrumental, which phenomena has been examined in depth by Reinhart (2002). First consider transitive verbs with an unaccusative alternate, as illustrated by the following data:

(37) a. The wind opened the door. (cause)
b. Max opened the door. (agent)
c. The key opened the door. (instrument)
d. The door opened. (theme)

The transitive verb *open* allows four types of θ-role to be associated with its external argument, i.e., cause, agent, instrument, and theme, as shown by (37a–d) respectively.[10] Here we focus on the Chinese counterpart of (37c), as in (38a):

(38) a. zhe-ba yaoshi kai na-dao men.
this-CL key open that-CL door
'This key opens that door.'
b. ??zhe-ba yaoshi **ziji** kai na-dao men.
this-CL key self open that-CL door
'??This key opens that door by itself.'

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10. The subject of (37a) is reminiscent of the external force associated with the reflexives of nature. The same type of construal, unfortunately, is not fully represented in Chinese: *kai* 'open' must form a compound with another monosyllabic verb *chui* 'blow' in order to take a cause subject, as shown by the contrast of (ia,b):

(i) a. *feng kai-le men.
wind open-INC door
'The wind opens the door.'
b. feng chui-kai-le men.
wind blow-open-INC door
'The wind blew the door open.'

It is then possible to attach *ziji* to the VP containing *chui-kai* 'blow-open', resulting in an inner reflexive construal, as evidenced by (ii):

(ii) feng ziji chui-kai-le men.
wind self blow-open-INC door
'The wind blew the door open by itself.'

Here a reasonable explanation is that *chui* 'blow' attributes the needed agentivity to the subject, which not only licenses the inner adverbial *ziji* of (ii), but also makes *feng* 'wind' an agent to fit in with *kai* in (ib).

According to (35a), there will be no proto-comitant role for (38a), since the subject is not agentive (i.e., an instrument is [+c, −m] rather than [+c, +m]). The instrument argument, though present, is not qualified as a proto-comitant. (38b) is thus blocked due to a failure to license inner Self.

The other case comes from the so-called "manner verbs" (cf. Levin & Rappaport 1995):

(39) a. Max peeled the apple (with the knife)
b. The knife peeled the apple.

The manner verb *peel* can appear either with an agentive subject plus an optional proto-comitant, as in (39a), or with an instrument as its external argument, as in (39b). Their Chinese counterparts are given in (40a,b) respectively:

(40) a. Akiu (yong zhe-ba dao) qie rou.
Akiu with this-CL knife cut meat
'Akiu cuts meat (with this knife).'
b. zhe-ba dao xiao pingguo.
this-CL knife peel apple
'This knife peels apples.'

Again, inner Self gets along with the agentive subject of (41a), but fails in conjunction with the instrumental subject of (41b).

(41) a. Akiu **ziji** (yong zhe-ba dao) qie rou.
Akiu self with this-CL knife cut meat
'Akiu cuts meat with this knife by himself.'
b. ??zhe-ba dao **ziji** xiao pingguo.
this-CL knife self peel apple
'??This knife peels apples (by) itself.'

4.3 Contrastive focus and inner self

So far we have worked out a theory of how inner reflexive adverbials should be related to anaphors in terms of argument reduction, though we have not touched upon their contrastive semantics that is shared by adnominal intensifiers. To begin with, we would like to offer an elementary semantics for a simple past sentence such as (42), where the outer reflexive reading is often suppressed for some reason:

(42) Akiu ziji chuli-guo zhe-jian shi.
Akiu self handle-PAST this-CL matter
'Akiu handled this matter by himself before.'

Here we represent the basic ingredients of (42) under the neo-Davidsonian approach advocated by Parson (1990, 1995), where θ-roles are viewed as thematic relations between arguments and an underlying event, and an adjunct is treated as a conjunct of the main predicate, both predicating upon the event argument, as illustrated in ((inner adverbial *ziji* is represented here as a Self operator taking the *v*P scope):[11]

(43) a. λx ∃e (Agent (x, e) & Self (*handling* (e) & Theme (*this matter*, e))) (*Akiu*)
b. λx ∃e (*handling* (e) & Agent (x, e) & Theme (*this matter*, e)
& Comitant (x, e) & ~∃y (y≠x & Comitant (y, e))) (*Akiu*)
c. ∃e (*handling* (e) & Agent (*Akiu*, e) & Theme (*this matter*, e)
& Comitant (*Akiu*, e) & ~∃y (y≠*Akiu* & Comitant (y, e)))

Since there is an agentive subject in the sentence, an optional comitative argument is introduced, and the contrastive focus triggers the negation over the alternative set of the comitative argument, which turns out to be a coargument of the subject *Akiu*, as in (43b). Finally, after the predication completes, the following semantic representation emerges, as in (43c). Since a proto-comitant role is defined as "e is with x", we end up with the desirable interpretation 'Akiu handled this matter without others' company/help except for himself'.

In sum, we have developed a workable semantics for inner Self. Namely, the inner selfhood should be decomposed into a contrastive focus with a *v*P scope plus the coargumental relation between an agent and a proto-comitant. In the next section, we will examine how this proposal fairs with the outer reflexive adverbials.

5. Outer adverbial *ziji* as a focus adverb

5.1 Inner self and inner how

Our focus analysis of inner Self leaves us with a hard nut to crack. That is, exactly what θ-role is reduced in presence of outer reflexive adverbials? Could the outer Self usage follow from other independent principles? By Occam's Razor, it would be nice to have one kind of solution for both inner and outer reflexive adverbials.

Before we proceed any further, it is worthwhile to note that there is a phenomenon exactly parallel to the inner-outer dichotomy at issue here: It has been noted by

11. One may imagine a number of ways to formulate the idea. Here we simply pick the most intuitive way to present the reduction process without the complications of the corresponding syntactic structure. Moreover, we will not concern ourselves with tense/aspect elements in the following semantic representations as long as they do not have an impact on reflexive construals.

Tsai (1999b, 2008) that *zenme*, a Chinese *how*, also has two types of interpretation depending on its syntactic distribution: Outer *how* is causal, similar to *how come* in English, while inner *how* is instrumental, as shown by the contrasts between (a) and (b) clauses below:

(44) *Modals:*
a. tamen zenme hui chuli zhe-jian shi?
they how will handle this-CL matter
'How come they will handle this matter?'
b. tamen hui zenme chuli zhe-jian shi?
they will how handle this-CL matter
'How will they handle this matter?'

(45) *Adverbs of Quantification:*
a. tamen zenme changchang chuli zhe-zhong shi?
they how often handle this-kind matter
'How come they often handled this kind of matter?'
b. tamen changchang zenme chuli zhe-zhong shi?
they often how handle this-kind matter
'How did they often handle this kind of matter?'

(46) *Control Verbs:*
a. Akiu zenme dasuan qu Taibei?
Akiu how intend go Taipei
'How come Akiu intends to go to Taipei?'
b. Akiu dasuan zenme qu Taibei?
Akiu intend how go Taipei
'How does Akiu intend to go to Taipei?'

Curiously enough, the subject agentivity effects duly show up for inner *how* as well: That is, the instrumental/manner reading is consistently blocked when the subject is not agentive, as evidenced by (47–51):

(47) *passives:*
na-ge xuesheng zenme bei pian-le, hai xiang pian bieren?
that-CL student how BEI cheat-INC still want cheat others
a. 'How come that student himself was cheated, and he still wants to cheat others?'
b. #'By what means was that student cheated, and he still wants to cheat others?'

(48) *unaccusatives:*
na-ben shu zenme chu-xian le?
that-CL book how show-up INC
a. 'How come that book showed up?'
b. #'By what means did that book show up?'

(49) *locative-existential predicates:*
cong faguo zenme lai-le san-ge gongchengshi?
from France how come-PRF three-CL engineer
a. 'How come from France came three engineers?'
b. #'By what means did three engineers come from France?'

(50) *transitive sentient verbs:*
Akiu zenme xihuan hua, jiu guli dajia zhong?
Akiu how like flower then encourage people plant
a. 'How come Akiu likes flowers, and then encouraged people to plant them?'
b. #'In what manner does Akiu likes flowers, and then encouraged people to plant them?'

(51) *unergative sentient verbs:*
Akiu zenme ku-le qilai?
Akiu how cry-INC up
a. 'How come Akiu started to cry?'
b. #'In what manner did Akiu start to cry?'

The correspondence between inner Self and inner *how* is too systematic to be dismissed as a coincidence. Our hunch is that they are subject to the same syntacto-semantic restrictions due to their positions in the "topography" of Chinese adverbials as sketched in the diagram (28). Take a solid example like (52) or example: In terms of syntax, a question operator Q merges to C according to the parametric setting of Chinese (cf. Cheng 1991; Aoun & Li 1993; Tsai 1994, 1999a), while inner *how* merges to the edge of *v*P, i.e., the VP periphery in Belleti's (2005) terms, as shown in (52a):

(52) Akiu hui zenme chuli zhe-jian shi?
Akiu will how handle this-CL matter
a. Syntax: [$_{CP}$ Q [$_{TP}$ Akiu hui [$_{vP}$ zenme [$_{vP}$ chuli zhe-jian shi]]]]
b. Semantics: Q_f (∃e (*handling* (e) & Agent (*Akiu*, e) & Theme (*this matter*, e) & f(comitant)))

In terms of semantics, a comitative argument is again introduced by the agentive subject to license inner *how*, as illustrated in (52b). The comitant in turn provides a choice function variable unselectively bound by the Q-operator in the left periphery along the line of Reinhart (1998).[12] As a result, sentences without an

12. Following Reinhart (1998), we may elaborate on the semantics further along the line of Hamblin (1973) and Karttunen (1977), where questions are viewed as sets of true propositions and the *wh*-expression (a choice function in our case) is existentially bound, as sketched below:

(i) {P| ∃$_f$ (CH(f) & P=^(will (∃e (*handled* (e) & Agent (*Akiu*,e) & Theme (*this matter*,e) & f(comitant)))) & true (P))}

For the ease of exposition, we will continue to use the original notation while adopting this elaboration tacitly.

agentive subject license neither inner Self nor inner *how*, because there is simply no way for them to introduce an optional comitative argument.

If this move turns out to be on the right track, then we have not only found independent evidence for our analysis of inner Self, but also provide a unified account of the subject agentivity restriction on Chinese adverbials.

5.2 Outer self and outer how

By parity of reasoning, there must be a close connection between outer Self and outer *how* in terms of syntax-semantics mapping. In the following discussion, we are to show that this is indeed the case. First consider the following interpretive contrast of *how come* and *why* in English: When *how come* co-occurs with a stative predicate, there is always a change-of-state flavor attached to the question, as evidenced by (53a):

(53) a. How come the snow is white? (It was very muddy this morning.)
b. Why is the snow white? (I am not aware of any scientific explanation.)

This presents a sharp contrast to the epistemic question of (53b) (cf. Bromberger 1992), *which* is typically associated with *why*. The same contrast is also attested in Chinese, as evidenced by the causal reading of (54) vs. the epistemic reading of (55):[13]

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13. It is instructive to note that ordinary *why*-questions are often three-way ambiguous among causal, epistemic, and purposive readings. Causal *why* and epistemic *why* pattern together syntactically as CP/IP-adverbials, whereas purposive *why* functions as a vP/VP-adverbial, observing the subject agentivity. As illustrated below, *weishenme* 'why' typically appears before the future modal, and can be interpreted as either causal or epistemic:

(i) Akiu weishenme hui shengbing?
Akiu why will sick
'Why would Akiu be sick?'
a. Causal Answer: He was infected by his roommate.
b. Epistemic Answer: He is an old man.

By contrast, its cognate *wei(-le) shenme* 'for what' typically appears after the future modal, and can only be interpreted as purposive, as evidenced by (ii):

(ii) Akiu hui wei(-le) shenme cizhi?
Akiu will for(-PRF) what resign
'For what purpose would Akiu resign?'
Purposive Answer: He wanted to protest the injustice.

Once we substitute the stative predicate *shenbing* 'sick' for *cizhi* 'resign', the sentence degrades dramatically, as in (iii), where *Akiu* is a theme instead of an agent:

(54) xue zenme shi baide?
snow how be white
'How come the snow is white?'

(55) xue weishenme shi baide?
snow why be white
'Why is the snow white?'

This indicates that *how come*, as well as outer *how*, presupposes a cause event which rendered the snow white, while an epistemic question does not. To account for (53a) and (54), Tsai (2008) puts forth the claim that *how come* and outer *how* introduce an implicit causative predicate CAUSE, which takes two event arguments, that is, a cause event and an resultant state in the vein of Vendler (1967), as illustrated below:[14]

(56) Qe (∃s (CAUSE (e, s) & *being-white* (s) & Theme (*the snow*, s)))

Here it is the cause event e that is subject to interrogative construals, a form of reduction, which changes the snow into the state s, namely, the state of being white. Therefore, when people utter 'How come the snow is white?', they want to know what made the snow white, or more literally, how the change-of-state came about.

In light of the above observation, we may apply the same semantics further to outer *how* with an episodic predicate: The internal argument of CAUSE is an effect event rather than a resultant state, whereas the external argument can be either an event (i.e., cause) or an individual (i.e., causer). Let's take (57) for example:

(57) Akiu zenme hui chuli zhe-jian shi?
Akiu how will handle this-CL matter
a. Syntax: [$_{CP}$ Q [$_{TP}$ Akiu [$_{ModP}$ zenme [$_{ModP}$ hui [$_{vP}$ chuli zhe-jian shi]]]]]
b. Semantics: Qe (CAUSE (e, e′) & *will* (∃e' (*handling* (e′) & Agent (*Akiu*, e′) & Theme (*this matter*, e′)))

(iii) *Akiu hui wei(-le) shenme shengbing
Akiu will for(-PRF) what sick
'*For what purpose would Akiu be sick?'

This indicates that purposive *why* is indeed subject to the subject agentivity, patterning with instrumental *how* and manner *how* in Chinese.

14. This notion of the eventual causative predicate is very much the same as the one proposed by Parsons (1990, 1995) to account for causative constructions such as *Mary galloped her horse*:

(i) For some event e, Mary is the agent of e.
(ii) For some event e', the horse is the agent of e', and e' is a galloping.
(iii) e CAUSES e'.

Here the speaker is essentially soliciting information as to who or what causes the effect event e', i.e., the event of Akiu's handling this matter.[15]

We now have a useful tool for sharpening our intuition about outer Self. In light of this new development, we may venture to reverse the logic of correlating inner Self with inner *how*: If it is a cause/causer argument that is bound by a question operator in construing outer *how*, then it must be a cause/causer argument that is subject to outer reflexive construals. More specifically, outer Self patterns with outer *how* in involving a causal relation. For outer reflexive construals, it is the cause/causer argument that is identified with the subject under the coargumental relationship, as sketched below:

(58) *Causality of Outer Self:*
Outer Self presupposes an implicit causative predicate, whose external argument is either a cause or a causer.

5.3 Causality and reflexives of nature

As is clear from our previous discussion in Section 3.1, outer Self merges to the CP layer, hence scoping over the entire IP, and it is impossible for a cause event to be construed as a coargument. One nice consequence along this line of thinking

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15. An interesting question here is why a reason expression may co-occur with outer Self, as exemplified below:

(i) a. Akiu yinwei Xiaodi ziji hui chuli zhe-jian shi.
Akiu because.of Xiaodi self will handle this-CL matter
'Akiu will handle this matter willingly because of Xiaodi.'
b. Akiu weishenme ziji hui chuli zhe-jian shi?
Akiu why self will handle this-CL matter
'Why will Akiu handle this matter willingly?'

The answer may lie in the epistemic nature of reason expressions. As pointed out by Tsai (2008), it is actually possible to tease causal questions from reason questions with a stative predicate, as shown by the following contrast:

(ii) a. tiankong zenme shi lande? [causal question]
sky how be blue
'How come the sky is blue (as the typhoon is approaching)?'
b. tiankong weishenme shi lande? [reason/epistemic question]
sky why be blue
'Why is the sky blue (a scientific account is in order)?'

This suggests that causal and reason expressions may well occupy different kinds of functional projections in the left periphery (see also Shlonsky & Soare 2011).

is that we have a ready answer for the emergence of reflexives of nature. First consider (59):

(59) feng da-le, men **ziji** hui kai.
wind big-INC door self will open
'When wind grows stronger, the door naturally will open.'

In absence of a coargument, outer Self essentially serves as a λ-operator binding a predication variable introduced by the cause event. This in turn triggers predication on the external force present in the discourse (i.e., the stronger wind), as illustrated below:

(60) λe ∃e′ (CAUSE (e, e′) & *opening* (e′) & Theme (*the door*, e′)) (*stronger wind*)

We thus have a straightforward account of our early observation that a proper cause must be identified in the context for certain outer Self.

Next consider the 'without cause' reading in (61a): As we learn from the discourse, the cause is unknown to the speaker, which virtually asserts the nonexistence of a cause event, as illustrated in (61b):

(61) a. bu zhi zenme de, Akiu ziji ku-le qilai.
not know how DE Akiu self cry-INC up
'(I) don't know how (that happened). Akiu started to cry without cause.'
b. ∃e′ (~∃e (CAUSE (e, e′)) & *crying* (e′) & Sentient (*Akiu*, e′))

A similar case can be found in unaccusative sentences such as (62a), where the derived subject cannot be a causer, hence disqualified as a coargument. Since we may infer from the discourse that the speaker has no knowledge of the cause event, outer Self produces a 'spontaneous' reading, as represented by (62b):

(62) a. wo hai mei zhao, na-ben shu jiu ziji chu-xian le.
I still have.not search that-CL book then self show-up INC
'I have not looked for it yet. Then the book showed up spontaneously.'
b. ∃e′ (~∃e (CAUSE (e, e′)) & *showing-up* (e′) & Theme (*the book*, e′))

All in all, we have good reasons to believe that outer Self is causation-oriented, and has a lot to do with discourse construals associated with the left periphery.

5.4 Anti-causal readings revisited

As illustrated in the diagram (29), middle Self differs from outer Self minimally in merging to the IP layer, where the contrastive focus is again a force to reckon with. First consider (63), the reflexive counterpart of the outer *how*-question (57):

(63) Akiu ziji hui chuli zhe-jian shi.
Akiu self will handle this-CL matter
'Akiu will handle this matter on his own initiative.'

Given the semantics laid out in (58a), we may well take the causal relation encoded by the implicit causative predicate to be an integrated part of the outer selfhood, as shown by the derivation from (64a) to (64b):

(64) a. λx ∃e (Self (*handling* (e) & Agent (*Akiu*, e) & Theme (*this matter*, e))) (*Akiu*)
b. λx ∃e (CAUSE (x, e) & *handling* (e) & Agent (x, e) & Theme (*this matter*, e) & ~∃y (y≠x & CAUSE (y, e)) (*Akiu*)
c. ∃e (CAUSE (*Akiu*, e) & *handling* (e) & Agent (*Akiu*, e) & Theme (*this matter*, e) & ~∃y (y≠*Akiu* & CAUSE (y, e))

When the predication is complete, as in (64c), the resulting interpretation is "No one other than Akiu makes him handle this matter", which is a desirable result. The same treatment applies to the following locative-existential construction:

(65) cong faguo ziji lai-le san-ge gongchengshi.
from France self come-PRF three-CL engineer
'From France came three engineers without invitation.'

Since the alternative set is built on the implicit causer of the coming event, and since it is this causer that is in a coargumental relation with the postverbal subject, the now familiar anti-causal reading duly emerges. This is illustrated by the semantic representation (66), which literally means 'three engineers invited themselves to come from France':

(66) ∃e (CAUSE (*three engineers*, e) & *coming* (e) & Theme (*three engineers*, e) & Source (*France*, e) & ~∃y (y≠*three engineers* & CAUSE (y, e))

We may thus draw the conclusion that the outer selfhood involves a contrastive focus with a sentential scope plus the causality which either licenses a coargumental construal, or triggers an event-level predication, as is the case with reflexives of nature.

6. Further consequences

6.1 Inner-outer dichotomy in compounding

It is common knowledge in the literature on Classic Chinese that simplex Self is actually a combination of a reflexive adverb *zi* and a reflexive pronoun *ji*. Interestingly enough, the inner-outer dichotomy of reflexive adverbials is faithfully mirrored in Chinese compounding on the part of *zi*. Specifically, when it occupies the second position of a compound, only the typical inner readings are available, as evidenced by (67a–c):

(67) a. Akiu du-**zi** qu-le Taibei.
Akiu alone-self go-PRF Taipei
'Akiu has gone to Taipei alone.'
b. Akiu qin-**zi** qu-le Taibei.
Akiu close-self go-PRF Taipei
'Akiu has gone to Taipei in person.'
c. Akiu si-**zi** qu-le Taibei.
Akiu private-self go-PRF Taipei
'Akiu has gone to Taipei in private.'

(67a–c) contrasts with (68a–c) minimally, where *zi* appears in the first position, producing the typical outer readings in conjunction with a variety of verbal/modal elements:

(68) a. Akiu **zi**-yuan qu-le Taibei.
Akiu self-wish go-PRF Taipei
'Akiu has gone to Taipei of his own accord.'
b. Akiu **zi**-dong qu-le Taibei.
Akiu self-move go-PRF Taipei
'Akiu has gone to Taipei on his own initiative.'
c. Akiu **zi**-li qu-le Taibei.
Akiu self-ability go-PRF Taipei
'Akiu has gone to Taipei by his own ability.'

The comparison thus reveals a microsyntax of the inner-outer dichotomy at a morphological level, which virtually provides a window to the topography of reflexive adverbials in Classic Chinese. Though fossilized in compounding, the distinction between inner *zi* and outer *zi* is closely mimicked by their contemporary counterparts. The versatile construals of *zi* therefore testify to the robust analyticity of Classic Chinese, which, as we have seen throughout the paper, has not been lost in its Modern counterpart.

The reflexive of nature, on the other hand, deserves further consideration. Similar to outer Self, *zi-ran* 'self-so' requires the presence of some external force or physical condition, as in (69a), and cannot stay in the scope of the future modal *hui*, as in (69b). But unlike simplex Self, (69b) cannot be improved by replacing the force/condition with some built-in mechanism or a supernatural cause, as evidenced by (69c).

(69) a. feng da-le, men **zi**-ran hui kai.
wind big-INC door self-so will open
'When wind becomes stronger, the door naturally will open.'
b. *feng da-le, men hui **zi**-ran kai.
wind big-INC door will self-so open
c. *men hui **zi**-ran kai, (you gui!)
door will self-so open have ghost

This indicates that the range of interpretive possibility of *zi* has already been narrowed down by compound formation. This is because it is no longer allowed to interact further with other components in syntax.[16]

6.2 Relating anaphors to reflexive adverbials

As for the origin of the inner-outer dichotomy in question, it is natural to assume that these adverbials start as an argument, i.e., an object anaphor, and then raise to an adjunct position, presumably the edge of a phase such as *v*P and CP along the line of Chomsky (2000, 2001). As a matter of fact, if we look carefully, there is still some residue of this process in Modern Chinese. As seen in the small clause construction of (70a,b), *ziji* 'self' seems to raise from the embedded subject position to a matrix adjunct position:[17]

(70) a. Akiu renwei [ziji hen congming].
Akiu consider self very smart
'Akiu considers himself very smart.'

16. A point of interest here concerns the fact that *zi-ran* 'self-so' is also the Chinese word for nature in the physical sense. The exact cognitive process of the transition from selfhood to physical nature is in itself a fascinating topic, which regretfully is beyond the scope of this study.

17. Note that (70b) might have another reading where the embedded empty subject could be interpreted as a pro, hence not necessarily bound by the matrix subject *Akiu*. I personally do not get this reading, but if it is possible, then *ziji* must have evolved into a genuine adverb for some speakers.

b. Akiu ziji$_k$ renwei [e$_k$ hen congming].
Akiu self consider very smart
'Akiu considers himself very smart out of his own judgment.'
c. *Akiu renwei [PRO hen congming].
Akiu consider very smart

The displaced *ziji* in (70b) cannot be an adverbial, and must originate from the subject position of the small clause complement in (70a). This is because the embedded subject cannot be a PRO, and the main verb *renwei* cannot take a control complement, as evidenced by (70c). Even more interestingly, its semantics has also shifted to a combination of anaphors and reflexive adverbials, which may well result from the category-position change. Furthermore, we may even conflate the structure with a compound *zi-ren* 'self-consider', as shown below:

(71) Akiu zi-ren hen congming.
Akiu self-consider very smart
'Akiu considers himself very smart out of his own judgement.'

Here we base our analysis on a proposal by Clark & Roberts (1993) and Roberts & Roussou (1999), according to which grammaticalization is driven by the computational conservativity on the part of second generation learners, where a configuration created by Move is reanalyzed as one created by Merge. Therefore, it is not hard to imagine that cliticization or object fronting in Classic Chinese may undergo structural simplification of the same sort, shifting from a verb-complement structure to a modifier-head structure.

7. Concluding remarks

To wrap up our discussion, we have argued that Chinese reflexive adverbials should be divided into two groups, i.e., inner and outer reflexive adverbials. To account for the dichotomy in question, we propose that inner Self merges to the VP/*v*P layer, while outer Self merges to the IP/CP layer. The inner selfhood is defined as comitativity plus a contrastive focus with a *v*P scope, expressing aloneness, privateness, and physical presence. By contrast, the outer selfhood is defined as causality plus a contrast focus with a sentential scope, expressing voluntariness, exclusiveness, spontaneousness, naturalness, etc., depending on the kind of constituent subject to modification. Furthermore, the dichotomy receives an independent support from a full-fledged parallel on the part of Chinese *wh*-adverbials (cf. Tsai 2008). We therefore have discovered a solid case for the cartographic approach, in that the

syntax-semantics mapping envisioned by Rizzi (1997) and Cinque (1999) is indeed at work for shaping the topography of adverbials across languages.

From a cognitive point of view, *ziji* has been steadily abstracting away from its anaphorhood as it appears higher and higher in syntactic projections, with the selfhood shifting from individuality to comitativity, then to causality, and finally to the intrinsic nature of this world, as visualized in the following hierarchy in relation to its structural heights:

(72) by nature > in/of oneself > by/with oneself > self

This conception of selfhood presents an interesting comparison with what Lao Tze has said about selfhood and nature: A human being is modeled on the earth. The earth is modeled on the heaven. The heaven is modeled on the Way. And the Way is modeled on selfhood. For Lao Tze, selfhood is everything. It links our self-consciousness to the intrinsic properties of our world, which is in turn linked to the Way through naturalness. In other words, the ultimate way is the way it is, without cause, without effect, without generation, and without destruction.

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CHAPTER 6

System repairing strategy at interface

Wh-in-situ in Mandarin Chinese

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Wh-words in Chinese are ambiguous in specific contexts. In actual conversational situations, when speakers put different combinations of stress with intonation on sentences, the relevant *wh*-words are no longer ambiguous. The encoded prosodic forms can be analyzed as phonological features in the feature bundles associated with a given lexical item in the Lexical Array. Since these prosodic features have semantic effects on the output of the computational system at the Conceptual-Intentional interface, they satisfy Legibility conditions and therefore, they do not violate the Inclusiveness condition. Prosodic marking is only activated as a last resort in cases where semantic ambiguity arises, which can be viewed as a system repairing strategy at interfaces in the sense of Reinhart (2006).

1. Introduction

1.1 Historical review of the problem

In languages resorting to *wh*-movement, such as English, *wh*-elements move to the scope position, [Spec, CP], to be properly interpreted and they are treated as quantifiers which possess an inherent quantificational force. Therefore, the nature of *wh*-movement is Quantifier Raising (QR). A moved *wh*-phrase binds the trace that it left in-situ as a variable. Chinese is known as a *wh*-in-situ language in that the relevant *wh*-element stays in their base position instead of undergoing an overt movement to the [Spec, CP] position, as illustrated in (1).

(1) Ni xihuan shenme?
you like what
'What do you like?'

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The research questions are the following ones. First, what is the nature of Chinese in-situ *wh*-words? More concretely, are they quantifiers like their English counterparts or are they bound variables? Second, since *wh*-words do not undergo overt raising to the scope position, how is a *wh*-in-situ question interpreted properly at LF? In this section, I will give a brief historical review of these questions.

Huang (1982) systematically derives *wh*-in-situ questions in Chinese by LF-movement; an in-situ *wh*-word undergoes covert movement to the scope position at LF to get its interpretation (cf. (2)). This analysis makes Chinese and English behave in the same way at different levels. Therefore, Chinese in-situ *wh*-words are also treated as quantifiers just like their English counterparts.

(2) LF: $[_{CP}$ shenme$_i$ $[_{IP}$ Ni xihuan t_i]]?
what you like
'What do you like?'

In a general fashion, LF-movement is criticized by many scholars, especially within the framework of the Minimalist Program (cf. Reinhart 1997, 2006). Aoun & Li (1993) have a critical point of view on the LF-movement analysis of *wh*-in-situ in Chinese and they propose that in the case of multiple *wh*-questions, each *wh*-word is bound by a corresponding *QU*-operator.

Huang (1982) and Cheng (1991) show that Chinese *wh*-words behave like polarity items in that when a *wh*-item appears in a *yes-no* question (cf. (3a)) or in an *if*-conditional clause (cf. (3b)), it gets an existential reading and when it appears in a negative context (cf. (3c)) or in the scope of a non-factive verb (cf. (3d)), it is ambiguous between an interrogative reading and an existential reading.[1] When a *wh*-word appears on the left side of the adverb *dou* 'all', traditionally treated as a universal quantifier, it gets a universal reading, as shown in (3e).

(3) a. Yes-no *question*
Ta chi-le shenme **ma**?
he eat-PERF what $Q_{yes\text{-}no}$
'Did he eat anything?' (∃)

b. If-*conditional*
Ruguo ni xiang chi shenme jiu gaosu wo.
if you want eat what then tell me
'If you want to eat anything, tell me then!' (∃)

1. In English, the negative polarity item *any* is licensed in the same contexts.

(i) a. Did you meet anyone? (Yes-no *question*)
b. I didn't eat anything. (*Negation*)
c. If you have any idea, please let me know. (If-*conditional*)

c. *Negation*
Ta **mei** chi shenme
he NEG eat what
i. 'What didn't he eat?' (Q)
ii. 'He did not eat anything.' (∃)

d. *Non-factive verbs*
Zhangsan **renwei** ta mai-le shenme
Zhangsan think he buy-PERF what
i. 'What does Zhangsan think that he bought?' (Q)
ii. 'Zhangsan thinks that he bought something.' (∃)

e. Dou-*quantification*
Ta shenme **dou** chi.
he what all eat
'He eats everything.' (∀)

For Cheng (1991), every clause should be syntactically or morphologically typed. English *wh*-questions are typed by *wh*-movement, and Chinese *wh*-questions are typed by the "typing particle" *ne*. This analysis is known as "Clausal Typing Hypothesis". For Cheng, in a simple *wh*-question such as (4), it is the sentence-final particle *ne* that contributes the interrogative force to the question and *ne* is analyzed as a true operator which binds the in-situ *wh*-word as a variable.

(4) Ni chi shenme (ne)?
you eat what NE
'What do you eat?'

This hypothesis attempts to establish a tight relationship between the syntactic form of a clause-type and its semantic interpretation; it also requires a direct mapping between syntax and semantics. Specifically, each syntactic form corresponds to a single semantic interpretation and each semantic reading is considered as an unambiguous output of the computational system. This implies that the output of the computational system should not be ambiguous at the level of interfaces. As the reader will see later, this is a very important assumption for my analysis.

Tsai (1994) proposes that *wh*-nouns are intrinsically variables bound by a null interrogative operator Op which is generated in the highest position and takes a wide scope over the entire sentence. Op is considered as the null counterpart of the *wh*-typing particle *ne* (*à la* Cheng 1991) and behaves like an unselective binder which binds all of the variables.[2] Since the binary binding construal between Op

2. "Unselective binding" mechanism was firstly adopted by Baker (1970) to interpret in-situ *wh*-words in a multiple *wh*-question in English (cf. ii). A covert question operator Q is generated

and the in-situ *wh*-word is realized at the sentential level, no island effect is observed, as demonstrated in (5).

(5) [$_{CP}$ Op$_i$ [$_{TP}$ Ni xihuan [$_{NP}$ [$_{CP}$ shei$_i$ xie de] [$_{N°}$ shu]]]]? (S-S/ LF)
you like who write DE book
'For which person x, such that you like the books that x wrote?'

Adopting the choice function mechanism, Tsai (1994) resolves the ECP asymmetry in Chinese by assuming that only *wh*-adverbs are intrinsically operators and systematically undergo LF-movement which obeys island conditions, as shown in (6).[3]

(6) a. *Ni xihuan Lu Xun weishenme xie de shu? (S-S)
you like Lu Xun why write DE book
('For what reason x, such that you like the books that Lu Xun wrote for x?')
b. *[$_{CP}$ weishenme$_i$ [$_{TP}$ Ni xihuan [$_{NP}$ [$_{CP}$ Lu Xun t$_i$ xie de] [$_{N°}$
why you like Lu Xun write DE
shu]]]]? (LF)
book
('For what reason x, such that you like the books that Lu Xun wrote for x?')

Different analyses of indefinites and of *wh*-in-situ in English are summarized in Figure 1 and some of the previous analyses of *wh*-in-situ in Chinese that I presented in this section are summarized in Figure 2.

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in the scope position at S-S and simultaneously binds both *wh*-words as variables by providing them with a wide scope reading.

(ii) a. Who read what?
b. S-S: [Q $_{<i,j>}$ [Who$_i$ read what$_j$]]?

This mechanism was later developed in Heim (1982) to interpret the indefinites. Under the unselective binding approach, in-situ *wh*-words and indefinites are treated as pure variables without any inherent quantificational force on their own and their interpretations only depend on the unselective binder which binds them.

3. The general criticism on the unselective binding approach is based on a problem related to semantic interpretation known as "Donald Duck problem" (cf. Reinhart 2006). Instead, Reinhart proposes a Choice Function mechanism to capture correctly the scope effects of the indefinites and of the *wh*-in-situ. The crucial claim is that the traditional ECP asymmetry between a *wh*-argument and a *wh*-adjunct should be reformulated more precisely as an asymmetry between a *wh*-noun and a *wh*-adverb in a general fashion.

Interpretation mechanisms	Indefinites	*Wh*-in-situ
LF-movement (QR)	Chomsky (1977)	Higginbotham & May (1981)
Unselective Binding	Heim (1982)	Baker (1970), Pesetsky (1987)
Choice Functions	Reinhart (1997)	Reinhart (1998)

Figure 1.

Nature of *wh*-words	Interpretation mechanism	
Operators	LF-movement of *wh*-words to the scope position.	Huang (1982)
Polarity items	Typing particle *ne* binds the in-situ *wh*-word.	Cheng (1991)
Variables	*QU*-operators bind in-situ *wh*-words as variables.	Aoun & Li (1993)
Wh-nominals: variables *Wh*-adverbs: operators	- Null operator Op generated in the scope position binds unselectively in-situ *wh*-nouns as variables; - *Wh*-adverbs undergo LF-movement.	Tsai (1994); Hu (2002)

Figure 2.

1.2 Main proposals

Analyses of *wh*-in-situ based on a null operator binding mechanism rely on the morphological existence of the so-called *wh*-typing particle *ne*. The particle *ne* is treated as the counterpart of the null Q operator in Cheng (1991) and as the counterpart of Op in the sense of Tsai (1994). However, the non-interrogative semantic and pragmatic function of the particle *ne* have been extensively discussed by scholars like Paris (1981), King (1986), Wu (2005), Boya Li (2006), Pan (2011a, 2015a, b; 2019), Pan & Paul (2016) and Paul & Pan (2017). For instance, Wu (2005) argues that *ne* is a discourse particle which signals the adjustment of the sharing common ground between the co-speakers. These authors agree that *ne* does not contribute any interrogative force to a given sentence. Namely, the fact that *ne* is compatible with questions does not necessarily imply that it transforms a declarative sentence into a question. Once we admit that *ne* is not an interrogative particle, the consequence is that it cannot function as a *wh*-typing particle or bind an in-situ *wh*-word as a variable. Thus, one important question is where the interrogative force of a *wh*-variable comes from if *ne* cannot provide it with an interrogative reading.

In this paper, I will argue for a prosodic licensing of *wh*-in-situ analysis in Chinese with empirical evidence. First, I will show that Chinese *wh*-words are underspecified and that they contain two values: [+Q] and [−Q]. The positive [+Q] value (i.e. interrogative) is the default one and such a value is "weak" in the sense that in "licensing contexts" it can be overruled by the negative value (i.e. non-interrogative). In certain types of licensing contexts, a *wh*-word is ambiguous

between [+Q] and [−Q]; the choice of the value depends on the prosodic form associated with the relevant sentence. A prosodic form can be treated as the overt phonetic realization of the relevant operator (i.e. Q or ∃) which binds an in-situ *wh*-word as a variable. Such a mechanism is called "Prosodic Licensing of *wh*-in-situ". Technically, this analysis seems incompatible with the traditional T-model in which PF branch and LF branch are separated after Spell-Out. The analysis based on a prosodic licensing of *wh*-in-situ would require prosodic forms to be only realized after Spell-Out at PF and this will create a timing problem. Therefore, the question is how these elements, which have been transferred to PF, can still affect the semantic interpretation at LF. My suggestion is that prosodic forms can be treated as phonological features in the feature bundles associated with each lexical item in the Lexical Array. Since these prosodic features have semantic effects on the output of the computational system at the Conceptual-Intentional interface, they satisfy Legibility conditions and therefore, they do not violate the Inclusiveness condition. This analysis then ensures that at PF, prosodic elements can still be treated as the realization of the relevant operators which bind in-situ *wh*-words as variables. I will explore this possibility in detail in Section 2.3.1.

In my analysis, the interpretative ambiguity of sentences such as those in (3) could be due to the imperfection of the computational system, but the optimal design of the human language makes it possible to repair such an imperfection by using prosody at interfaces. Different combinations of the stress with appropriate prosodic forms construct a Reference-Set in the sense of Reinhart (2006). Each prosodic form corresponds to only one specific semantic interpretation and in this sense, no interpretive redundancy is created and the Economy Principle is not violated. Therefore, such a repair mechanism is tolerated by the computational system. Prosodic licensing of *wh*-in-situ also makes the Clausal Typing Hypothesis proposed by Cheng (1991) function in a more general way. In addition to morpho-syntactic typing, prosodic typing is also a possibility to properly interpret a *wh*-question.

This article is organized as follows. Section 2 is devoted for a detailed description of prosodic licensing of *wh*-in-situ in Chinese. The empirical consideration behind this analysis and its theoretical consequences will be discussed in Section 3. Section 4 concludes the paper.

2. Prosodic licensing of *wh*-in-situ in Chinese

2.1 General consideration

Tsai (1994) proposes that in-situ *wh*-words are unselectively bound by a morphologically null operator Op to get an interrogative reading. As discussed in Section 1, previous studies show that Chinese *wh*-words are ambiguous between several possible readings in certain contexts, such as negative contexts, non-factive verb contexts, etc. From the point of view of processing, if Op is morphologically and phonetically null, one wonders how the co-speaker can successfully identify such a sentence as a question. Let us take the following sentence with a non-factive verb for example,

(7) *Non-factive verbs*
Zhangsan renwei Lisi mai-le shenme
Zhangsan think Lisi buy-PERF what
i. 'What does Zhangsan think that Lisi bought?' (Q)
ii. 'Zhangsan thinks that Lisi bought something. (∃)

If the PF representations of these two different readings in (7) are exactly the same, the co-speaker who heard such a sentence will have no way to get the correct interpretation. In other words, if the speaker who utters this sentence does not make any prosodic difference between these two readings, her/his co-speaker will not react appropriately with regard to the speaker's expectation because the co-speaker does not know whether s/he should interpret the *wh*-word as a question word or as an existential phrase (i.e. the illocutionary force associated with each reading). Crucially, in real conversational situations, these two readings can be differentiated by corresponding prosodic contours, as demonstrated in (8).[4]

(8) a.
Zhangsan renwei Lisi MAI-le shenme
Zhangsan think Lisi buy-PERF what
(a stress on the embedded verb *mai* 'buy'; no stress on the *wh*-word; a neutral or a slight falling intonation at the end of the sentence.)
i. #'What does Zhangsan think that Lisi bought?' (Q)
ii. Ok 'Zhangsan thinks that Lisi bought something.' (∃)

4. The idea of Prosodic Licensing of *wh*-in-situ in Chinese has been initially defended in my PhD dissertation written in French in 2007 later published as a monograph (cf. Pan 2011a).

b.

Zhangsan renwei Lisi mai-le shenme
Zhangsan think Lisi buy-PERF what

(no stress on the embedded verb *mai* 'buy'; no stress on the *wh*-word; a slight rising intonation at the end of the sentence.)

i. Ok 'What does Zhangsan think that Lisi bought?' (Q)
ii. #'Zhangsan thinks that Lisi bought something.' (∃)

(8a, b) shows that, on the one hand, each target reading is associated with a specific prosodic pattern and on the other hand, each specific prosodic pattern is associated with a single target reading. The mapping between prosody and semantics is strictly one-to-one. Let us compare (7) with (8). The observation based on (7) suggests that the mapping between syntax and semantics is not enough to disambiguate the *wh*-word in an ambiguous licensing context in that a specific syntactic form is not always sufficient to guarantee a unique output at LF. The sentence in (8) indicates that iff such a syntactic form is associated with a specific prosodic contour, the sentence gets an unambiguous output at LF. From this perspective, the sentence in (7) is only ambiguous in its syntactic representation. In fact, all of the ambiguous cases presented in (3) can be systematically disambiguated by prosody, which is an important piece of empirical evidence supporting my analysis. I will come back to this point in detail in the next section.

A general consideration behind my analysis is that the illocutionary force of a sentence should be overtly indicated in an ambiguous context; otherwise, the output of the computational system is still ambiguous for the co-speaker, which is not a desirable situation. This consideration is based on the spirit of the Clausal Typing hypothesis in that every clause must be typed and that each syntactic type is associated with a single semantic interpretation or with a single type of illocutionary force. However, there is an important difference between my proposal and the original Clausal Typing hypothesis. In Cheng's (1991) sense, the clausal typing is only realized by means of morpho-syntax. Typologically, the typing realized by a morphological interrogative particle, such as in Chinese, and the typing realized by a syntactic *wh*-movement, such as in English, are two alternative ways to type a *wh*-question; these two ways of typing are equal and have the same status. As the reader will see in the next section, the prosodic typing of *wh*-in-situ that I will propose does not have the same status as the morpho-syntactic typing. Prosodic elements intervene in ambiguous licensing contexts when the relevant sentence would still remain ambiguous at the level of interfaces because morpho-syntax fails to type it. In this respect, prosodic licensing of *wh*-in-situ only works as a last resort.

2.2 Underspecified *wh*-words

In the previous section, I assume that illocutionary force should be overtly indicated either by morpho-syntax or by prosody; otherwise, the output of the computational system still remains ambiguous. In Chinese, it has been convincingly argued that the so-called particle *ne* is not a *wh*-question typing particle and that it cannot transform declarative sentences into questions (Paris 1981; King 1986; Wu 2005; Li 2006). The concrete discourse function of *ne* has been extensively studied in the cited works and I will not go into the detail here (also cf. Pan 2011a, 2015a, 2015b; Pan & Paul 2016; Paul & Pan 2017). It has also been observed that the presence of *ne* in a *wh*-question is never obligatory (cf. (4)). Furthermore, *ne* is even compatible with declarative and exclamative sentences, as shown in (9). Clearly, the particle *ne* does not type these sentences as questions.

(9) a. Ta zai kan dianshi ne.
he PROG watch television NE
'He is watching TV.'

b. Zhangsan hui zuo shi ne!
Zhangsan can write poem NE
'Zhangsan can (even) write poems!'

Also, when *ne* is placed at the end of an ambiguous sentence, such as the one in (7), the relevant sentence still remains ambiguous and *ne* is not sufficient to type this sentence as a question. However, a true interrogative particle is expected to do so. It is also important to point out that only appropriate prosodic contours can disambiguate the sentence even with the presence of *ne*, as shown in (8′).

(8′) a.
Zhangsan renwei Lisi MAI-le shenme ne
Zhangsan think Lisi buy-PERF what NE
(a stress on the embedded verb *mai* 'buy'; no stress on the *wh*-word; no stress on *ne*; a slight falling intonation on *ne*.)
i. #'What does Zhangsan think that Lisi bought?' (Q)
ii. Ok 'Zhangsan thinks that Lisi bought something.' (∃)

b.
Zhangsan renwei Lisi mai-le shenme ne
Zhangsan think Lisi buy-PERF what NE
(no stress on the embedded verb *mai* 'buy'; no stress on the *wh*-word; no stress on *ne*; a slight rising intonation on *ne*.)
i. Ok 'What does Zhangsan think that Lisi bought?' (Q)
ii. #'Zhangsan thinks that Lisi bought something.' (∃)

Importantly, a simple *wh*-question can get an unambiguous interrogative reading without any specific intonation (cf. (10)).

(10) Ni xihuan shenme?
you like what
'What do you like?'

In (10), the in-situ *wh*-word *shenme* 'what' can get an interrogative reading without being licensed by any overt typing particle or prosodic contour; in other words, the *wh*-question in (10) is not morpho-syntactically or prosodically typed. Then the question is how such a sentence is interpreted unambiguously as a question. My assumption is that *shenme* 'what' in (10) bears an inherent interrogative value, noted as [+Q]. The fact that this [+Q] value is systematically activated in simple *wh*-questions without any overt licensor suggests that the interrogative reading is a default reading of *wh*-words such as *shenme* 'what' in Mandarin. Second, it is also observed that in contexts such as *yes-no* questions, A-not-A questions, *if*-conditionals and *dou* 'all'-quantification, a *wh*-word receives non-interrogative readings (cf. (3a), (3b), (3e)). In these contexts, the *wh*-word takes a non-interrogative [−Q] value. Third, in contexts with negation or with non-factive verbs (cf. (3c), (3d)), a *wh*-word is underspecified between the two values (i.e. [+Q] and [−Q]) and they can get either an interrogative reading or a non-interrogative reading. I call this type of context "ambiguous licensing context". In the next section, I will list other licensing contexts and examine the possible readings of *wh*-words.

Based on the above observation, I assume that *wh*-words in Chinese are inherently bi-value [±Q] elements in the sense that they are underspecified (also cf. Pan 2011a, 2015c). The positive value [+Q] is their default reading because in a very simple sentence without any special prosodic contour or any licensing context, a *wh*-word gets an unambiguous interrogative reading. However, the [+Q] value is weak in the sense that it can be overruled in licensing contexts. When a *wh*-word appears in such a context, either it gets an unambiguous non-interrogative reading [−Q], such as in *dou*-quantification, *if*-conditionals and *yes-no* questions, or it is ambiguous between an interrogative reading and non-interrogative readings, such as in negative contexts or in non-factive verb contexts. In the latter case, only prosody can disambiguate the relevant sentences.

2.3 Licensing contexts

Previous studies have extensively discussed the possible nature of in-situ *wh*-words, i.e. operators, variables or polarity items. However, the study, which merely concentrates on the nature of *wh*-words, is not enough to account for the distribution of their different readings in different contexts. The reason why they are unambiguous in certain contexts but ambiguous in the others is still unclear. Whether a *wh*-word is ambiguous does not only depend on its status as a variable but also depends on

the contexts in which they appear, which leads me to make a distinction between different types of licensing contexts. As demonstrated earlier, these contexts do not have the same degree of tolerance with regard to the ambiguity of a given *wh*-word. I roughly divide them into two categories: the first type is called "unambiguous licensing context" in which a *wh*-word gets a unambiguous reading (i.e. only one reading), for instance, *if*-conditionals and *dou*-quantification; the other type is called "ambiguous licensing context" in which a *wh*-word is ambiguous between several possible readings, for instance, negative contexts and non-factive verb contexts. Let us now examine these two types of contexts.

2.3.1 *Unambiguous licensing contexts*

Huang (1982) shows that in a *yes-no* question, an *if*-conditional clause and an A-not-A question, a *wh*-word can get an existential reading and that in a sentence containing *dou*-quantification, it can get a universal reading. Importantly, in these contexts, the relevant *wh*-word cannot get an interrogative reading. I also found other contexts which behave in the same way. For instance, when a *wh*-word is under the scope of *haoxiang* 'seem', it gets an unambiguous existential reading,[5] as in (11).

(11) a. Ta **haoxiang** yijing chi-le shenme
he seem already eat-PERF what
'It seems that he has already eaten something.'

b. Ta **haoxiang** zai shenme difang ku ne
she seem at what place cry NE
'It seems that she is crying somewhere.'

It seems difficult to maintain the idea that Chinese *wh*-words behave as polarity items because contexts such as (11) are not the typical ones which license negative polarity items. Accordingly, it is more appropriate to say, at this stage, that a *wh*-word behaves as true variable in all of the unambiguous contexts. Its positive value [+Q] is overruled in these contexts and it obligatorily takes the [–Q] value. In this case, no special prosodic element is needed. Such an observation confirms that the prosodic licensing of *wh*-in-situ is only activated when the output of the computational system still remains ambiguous at the Conceptual-Intentional system; by contrast, prosody does not intervene when no interpretative ambiguity is detected at the level of interface. As an anonymous reviewer points out, the verb *kan-qi-lai* 'it looks/ it seems' behaves in a similar fashion.

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5. In fact, an echo question reading is available in this case; however, an echo question reading is not considered as a true interrogative reading because it is not interpreted as an information-seeking question.

(12) Akiu kanqilai [yijing chi-le shenme].
Akiu seem already eat-PERF what
i. Ok 'Akiu seems to have already eaten something.'
ii. #'What does Akiu seem to have already eaten?'

2.3.2 *Ambiguous licensing contexts*

2.3.2.1 *Prosodic licensing of wh-in-situ*

Previously examined contexts containing either negation or non-factive verbs are considered as ambiguous contexts in which a *wh*-word can receive several possible readings and only prosodic contours can disambiguate them (cf. 12). I will list more ambiguous contexts in this section. (13) demonstrates a progressive aspectual sentence containing a *wh*-word, and this sentence is four ways ambiguous.

(13) a. Ta zai chi-zhe shenme?
he PROG eat-DUR what
(no stress on the verb; no stress on the *wh*-word but a slight rising intonation at the end of the sentence.)[6]
'What is he eating?' (*Interrogative reading*)

b. Ta zai **CHI**-zhe shenme.
he PROG eat-DUR what
(a stress on the verb *chi* 'eat' and a falling intonation or a neutral intonation at the end of the sentence.)
'He is eating something.' (*Existential reading*)

c. Ta zai chi-zhe **SHENME!**
he PROG eat-DUR what
(a stress on the *wh*-word and a falling intonation at the end of the sentence.)
'What he is eating! (It smells bad!)' (*Exclamative reading*)

d. **TA** zai chi-zhe shenme?!
he PROG eat-DUR what
(a stress on the subject *he* and a falling or a neutral intonation at the end of the sentence.)
'What is HE eating?! = He is eating nothing!' (*Rhetorical question*)

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6. The rising intonation does not systematically give rise to an interrogative reading; many native speakers do accept the Q-reading with a flat intonation. Based on prosodic experiments, Tsai & Yang (2017) give convincing evidence to show that in ambiguous cases, a rising intonation gives rise to a standard question reading and a falling intonation gives rise to a non-interrogative reading (also known as special question readings).

Another ambiguous context is built on the quantified phrase (*yi*)*dianr* 'a little of'.

(14) a.

Ta	xiang	**HE**	dianr	shenme.
he	want	drink	a.little	what

(a stress on the verb *he* 'drink' and a falling intonation or a neutral intonation at the end of the sentence.)
'He wants to drink something.' (*Existential reading*)

b.

Ta	xiang	he	dianr	shenme?
he	want	drink	a.little	what

(no stress on the verb; no stress on the *wh*-word but a rising intonation at the end of the sentence.)
'What does he want to drink?' (*Interrogative reading*)

In an ambiguous context, the weak default positive value [+Q] is overruled and the relevant *wh*-word still remains underspecified between the two values (i.e. [+Q] and [−Q]). This type of context is not quantificationally "strong enough" to provide a sentence with a single operator to bind the *wh*-word. As a result, prosody is activated as a last resort to disambiguate the sentence. Prosodic forms can be treated either as the overt realization of the relevant operators or as the triggers which activate unselective binders in Tsai's (1994) sense. The mechanism which establishes the licensing relationship between the corresponding prosodic forms and the relevant *wh*-words is called "prosodic licensing of *wh*-in-situ". Prosodic licensing is only activated when a single syntactic form is not sufficient to generate different interpretations at LF in a given context. However, this analysis encounters a technical difficulty in the traditional T-model. As shown in Figure 3, the PF branch and the LF branch are departed after the point of Spell-Out. Prosodic forms are only realized after Spell-Out at the PF side. A potential problem is how prosodic elements located at PF influence the interpretation at LF. Technically, there is no direct mapping between these two branches after Spell-Out. The design of the Faculty of Language (cf. Chomsky 2004) does not permit prosodic elements to intervene into the syntactic derivation. In other words, syntactic derivation can never be driven by prosody.[7]

7. In the Minimalist Program, it is also technically impossible to make prosodic elements drive syntactic derivations. Therefore, the prosody licensing of *wh*-in-situ in my treatment is different from the view that syntactic derivation can be driven by prosody (also cf. Feng 2000 for a different view).

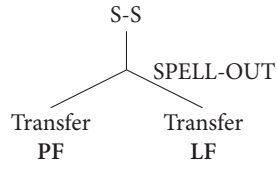

Figure 3.

A possible solution is to allow these prosodic forms to be generated in the Lexical Array before the numeration process begins. In this sense, specific stress patterns and the sentential intonation can be represented as phonological features among other features in the feature bundles associated with lexical items. Different combinations of stress with sentence intonation patterns construct the Referent-sets in the sense of Reinhart (2006). During the computation, even after Transfer, these phonological features can still be treated as the overt realization of the relevant operators which bind the in-situ *wh*-word and give it corresponding readings. Concretely, each of the sets corresponds to one and only one specific semantic interpretation, and this guarantees a single output at the level of interfaces. Let us take (13) for example. The four referent-sets are given in (15).[8]

(15) a. {ta, zai, chi, zhe, shenme, ↑} ➔ Q (13a)
b. {ta, zai, CHI, zhe, shenme, →} ➔ ∃ (13b)
c. {ta, zai, chi, zhe, SHENME, ↓} ➔ ! (13c)
d. {TA, zai, chi, zhe, shenme, ↓} ➔ Q! (13d)

Importantly, (15a–d) are four different Lexical Arrays. After Spell-Out, prosodic elements are transferred to the PF branch with the phonetic form of the lexicon. This analysis ensures that each output at LF corresponds to a single fixed output at PF; and therefore, the output of the computational system is no longer ambiguous at the level of interfaces. Figure 4 illustrates the existential reading in (15b).

One important question is whether the introduction of stress patterns in the Lexical Array violates the Inclusiveness condition in the Minimalist Program (Chomsky 2000, 2001). This condition says that no new elements (e.g. objects and features) are introduced in the course of computation apart from rearrangements of lexical properties (in particular, no indices, no traces, or levels in the sense of X-bar theory, etc.) Treating prosodic elements as features associated with lexical items does not really violate the Inclusiveness condition in that all of the prosodic features

8. Capitalized words are stressed; ↑ = rising intonation; → = neutral intonation; ↓ = falling intonation.

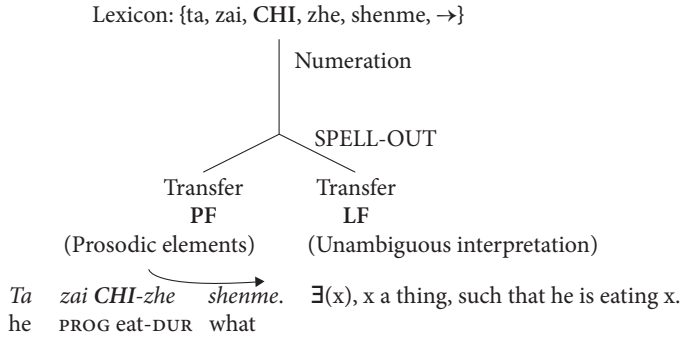

Figure 4.

already exist as a part of lexical items in the Lexical Array before the process of the numeration begins. Therefore, no new element is introduced during the derivation.[9] Lexical items are regarded as feature bundles in the Minimalist Program; each lexical item (i.e. lexical word and function word) is represented by a set of (a) pure syntactic features (such as EPP, Case), (b) semantics-related syntactic features (such as uninterpretable and interpretable φ-features) and (c) phonological features. According to Legibility conditions, the expressions generated by the Faculty of Language (FL) must be "legible" to the systems that access these objects at the interface between FL and external systems, for instance the Articulatory-Perceptual (A-P) system[10] and Conceptual-Intentional (C-I) system. Under such a consideration, the Strong Minimalist Thesis treats language as an optimal solution to interface conditions that the Faculty of Language must satisfy in that language is an optimal way to link sound and meaning, thus, an optimal solution to Legibility conditions (Chomsky 2000, 2001, 2004, 2008). As will be detailed immediately below, these phonological features associated with lexical items directly contribute to semantic interpretation at the C-I system; therefore, they satisfy Legibility conditions. As a result, they do not violate the Inclusiveness condition.

Prosodic licensing is costly in the sense of Economy Principle, but how come can the computational system tolerate such a mechanism? The answer suggested in Pan (2015c) to this question is inspired by the notion of "repair system" in the sense of Reinhart (2006). The idea is that when a syntactic form is not sufficient to generate different semantic interpretations at LF, some other mechanisms will be activated, such as QR viewed as a Scope Shift operation and Main Stress Shift.

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9. As one of the anonymous reviewers suggests, an alternative analysis is that prosodic elements form a prosodic structure (cf. Zubizarreta 1998).

10. Also referred to as sensorimotor system.

These mechanisms are treated as repair systems in the sense of Reinhart. In her analysis of English focus structure, Main Stress Shift is an operation which creates different focus patterns and each of these stress patterns corresponds to one and only one specific focus structure; meanwhile, each focus structure corresponds to one and only one specific semantic reading. Different stress patterns construct different Reference-Sets. The mechanisms are costly in the sense of the Economy Principle; however, the computational system can still tolerate them since they do not create any interpretative redundancy. Similarly, in my analysis, different prosodic elements combined with the sentence intonation and stress patterns generate different semantic interpretations at LF. Prosodic elements trigger the relevant operators, such as the interrogative operator, the existential quantifier, etc., to bind in-situ *wh*-variables and to give them corresponding readings. The relationship between a prosodic pattern and a semantic interpretation is strictly one-to-one. From this perspective, prosodic licensing of *wh*-in-situ can also be treated as a repair mechanism in the sense of Reinhart (2006). Therefore, no interpretative redundancy is created and the Economy Principle is not violated. Such a repair mechanism is thus tolerated by the computational system.

The idea that it is prosodic elements that license *wh*-in-situ is not new. Cheng & Rooryck (2000) argue that *wh*-in-situ in French is licensed by a specific intonational morpheme on Syntax, labeled as [Q:__]. The underspecified intonational morpheme Q licenses both *yes-no* questions (cf. (16a)) and *wh*-in-situ questions (cf. (16b)). The Q morpheme analysis is also supported by the existence of the lexicalized interrogative phrase *est-ce que* 'is it that'. In French, *est-ce que* is placed in the sentence initial position and it transforms declarative sentences into *yes-no* questions. In their analysis, *est-ce que* is taken as a lexicalized item which is phonetically realized as [ɛsk], as shown in (16c). Cheng & Rooryck observe a strong parallelism between the function of *est-ce que* and that of the intonational morpheme [Q:__]. Thus, [ɛsk] (*est-ce que*) is treated as the phonetically overt counterpart of the Q morpheme. They claim that (16a), (16b) and (16c) show the same intonational pattern.

(16) a. [Q:__] Jean a acheté un livre?
Jean has bought a book
i. 'Has Jean bought a book?'
ii. *'Jean has bought a book.'

b. [Q:__] Jean a acheté quoi?
Jean has bought what
'What has Jean bought ?'

c. **Est-ce que** Jean a acheté un livre?
is-it that Jean has bought a book
'Has Jean bought a book?' Cheng & Rooryck (2000)

Analyses based on a similar prosodic licensing mechanism can be found in Krein (2007). A joint experimental work by Sichel-Bazin, Buthke & Meisenburg (2012) shows that prosody plays a crucial role in the licensing of different types of *wh*-constructions in French. Ishihara (2005) observes that prosody can mark the scope of *wh*-in-situ questions in Tokyo Japanese. Her analysis also provides us with a piece of cross-linguistic evidence to support the analyses of *wh*-in-situ based on prosodic licensing. In Mandarin, prosody does not necessarily mark a wide or a narrow scope of the in-situ *wh*-word; however, it triggers the relevant operators which are able to bind the *wh*-word as a variable.

2.3.2.2 *∃ and Q readings*

An ambiguous licensing context permits existential, interrogative, exclamative, rhetorical and echo question readings of the relevant *wh*-word with certain phonological features. I will concentrate on the distribution and the generation of the ∃-reading and the Q-reading in this section.

Every licensing context (both ambiguous and unambiguous contexts) has its "key element", for instance, *ruoguo* 'if' is the key element of an *if*-conditional clause and a negative context has a negative word as its key element. I will show that there is a close relationship between the syntactic position of the existential quantifier generated in these licensing contexts and the position of the key elements of these contexts. Iff a *wh*-word appears in the c-command domain of the key element, the former is considered to be within such a context. This precisely excludes the case where the *wh*-word and the key element appear in the same sentence but the latter does not c-command the former. Under such a consideration, in a context where the key element is located at VP level, *wh*-subject, *wh*-direct object and *wh*-adverbial are not expected to behave uniformly. This is because subjects are higher than VP and objects are inside VP. There are different positions for adverbials; some are higher than VP and the others are lower.

Let us examine an ambiguous licensing context created by probability adverbs, such as *keneng* 'probably', *yexu* 'perhaps', *dagai* 'probably', etc. Under the scope of these adverbs, a *wh*-word is ambiguous between an existential reading and an interrogative reading. Probability adverbs are higher adverbials; they scope over both direct objects and lower VP-internal adverbials, such as manner adverbs. By contrast, they do not scope over subjects. Therefore, in a context containing a probability adverb, we only expect an ambiguity from *wh*-objects or from lower *wh*-adverbials but not from *wh*-subjects. This prediction is borne out, as shown in (17). In the following examples, instead of showing prosodic contours in a detailed way, I will only indicate whether the target reading needs or not a specific prosody.

(17) a. Ta yi-ge ren **dagai** hui qu shenme difang
she one-CL persone probably would go what place
i. 'She would probably go somewhere alone (for relaxing…)' (∃) with prosody
ii. 'Where would she probably go alone?' (Q) with prosody

b. Ta **keneng** hui zai shenme difang ku
she probably would at what place cry
i. 'She is probably crying somewhere.' (∃) with prosody
ii. 'Where is she probably crying?' (Q) with prosody

c. Shei **keneng** hui lai ?
who probably will come
i. 'Who will come probably?' (Q) without prosody
ii. *'Someone will come probably.' (*∃)

In (17a), the post-verbal complement *shenme difang* 'what place' is in the c-command domain of the probability adverb *dagai* 'probably' and with the corresponding prosodic contours, the former gets either an existential reading *somewhere* or an interrogative reading *where*. Similarly, in (17b), VP pre-verbal adverbial *zai shenme difang* 'at what place' is also ambiguous between an existential reading and an interrogative reading. By contrast, *wh*-subject *shei* 'who' in (17c) is not in the c-command domain of the adverb *keneng* 'probably' and it cannot get an existential reading. These examples show that in an ambiguous context, probability adverbs create a context in which the existential quantifier ∃ and the interrogative operator can be triggered by prosodic contours. The c-command domain of these adverbs overlaps with the scope of the ∃ quantifier. As for the interrogative reading Q in an ambiguous context, such a reading is always available; however, we must make a distinction between two sub-cases. When a *wh*-word is generated within the c-command domain of a probability adverb (cf. (17a), (17b)), the corresponding interrogative reading requires an appropriate prosodic contour; by contrast, when the former is generated outside the c-command of the latter (cf. (17c)), an interrogative reading is also available but without requiring any specific prosodic contour. In the latter case, such an interrogative reading is in fact the default reading of the *wh*-word itself and such a *wh*-word takes its inherent positive value [+Q].[11]

11. Adverbs such as *keneng* 'probably' and verbs such as *haoxiang/kan-qi-lai* 'it seems' express an epistemic modality; however, as one of the reviewers points out, the former permits both the existential reading and the interrogative reading; while the latter only permits the existential one. The contrast between these two types of elements is morpho-syntatic. Namely, *haoxiang* 'seem' is a matrix verb that seals off its complement with some form of existential closure, which in turn licenses the obligatory indefinite reading of the *wh*-in-situ in question. By contrast, *dagai* is only a sentential adverb which does not have this kind of property and therefore, it allows the

A subset of matrix verbs can also trigger the existential closure which allows an in-situ *wh*-word to get an ∃-reading. Here are some more examples to support this observation. Recall Huang's (1999) treatment of long passives in Chinese, where *bei* is considered as a matrix verb which takes a clausal complement. The following example shows that passive constructions also create an ambiguous licensing context.

(18) a. Zhangsan **bei** shenme zhuang-le yi-xia
Zhansan PASSIVE what bump-PERF once
i. 'Zhangsan was bumped by something.' (∃) with prosody
ii. 'Zhangsan was bumped by what?' (Q) with prosody
b. Zhangsan shenmeshihou **bei** men zhuang-le yi-xia
Zhangsan when PASSIVE door bump-PERF once
i. *'Zhangsan was bumped by a door sometime.' (*∃)
ii. 'When was Zhangsan bumped by a door?' (Q) without prosody

In (18a), the *wh*-word *shenme* 'what' is generated in the c-command domain of the passive verb *bei*; thus, *shenme* is considered to be within the passive licensing context. *Shenme* keeps its underspecified bi-values [±Q] and the relevant sentence is ambiguous between an existential reading and an interrogative reading, each of which needs a specific prosodic contour respectively. The prosodic form which licenses the ∃-reading activates the [−Q] value of *shenme* 'what' and the one which licenses the Q-reading activates the [+Q] value of the *wh*-word. Importantly, the Q-reading triggered by prosody in this case is not the default interrogative reading of the relevant *wh*-word itself. By contrast, *wh*-adverbial *shenme shihou* 'when' in (18b) is generated outside the scope of the passive verb *bei* and such a *wh*-adverbial is thus not considered to be within the licensing context created by passives. Recall that when a *wh*-word is not located within a licensing context, this *wh*-word is considered to be in an ordinary simple context where its default positive value [+Q] is activated. This is precisely the reason why the interrogative reading of *shenme shihou* 'when' in (18b) does not require any specific prosodic form to be associated with. Such an interrogative reading is the default Q-reading of the *wh*-word itself. More examples are given below to show that certain matrix verbs can trigger the existential closure to license the indefinite reading of *wh*-variables. As demonstrated earlier, previous studies show that a *wh*-word is ambiguous in the contexts containing non-factive verbs. Since a non-factive verb usually takes a subordinate clause as complement, I will examine the distribution of the ∃-reading and the Q-reading of the relevant *wh*-word when it appears in the main clause and in the embedded clause respectively.

alternative interrogative interpretation. More discussion on the relationship between adverbs of probability and the existential force can be found in Lin (1996).

(19) *Wh*-object of the embedded clause
Ta **juede** [wo ma-le shei] shei]
he think I insult-PERF who who
i. 'He thought that I had insulted someone.' (∃) with prosody
ii. 'Who did he think that I had insulted?' (Q) with prosody

(20) *Wh*-subject of the embedded clause
Ta **yiwei** [shei da-le Zhangsan]
he think who hit-PERF Zhangsan
i. 'He thought that someone hit Zhangsan.' (∃) with prosody
ii. 'Who did he think hit Zhangsan?' (Q) with prosody

(21) *Wh*-adverbial of the embedded clause
Zhangsan **renwei** [Lisi zai nali xue-guo fawen]
Zhangsan think Lisi at where learn-EXP French
a. 'Zhangsan thought that Lisi had learnt French somewhere.' (∃) with prosody
b. 'For what place x, such that Zhangsan thought that Lisi had learnt French at x?' (Q) with prosody

(22) *Wh*-subject of the main clause
Shei **renwei** [ni tou-le qian]
who think you steal-PERF money
i. *'Someone thought that you had stolen the money.' (*∃)
ii. 'Who thought that you had stolen the money?' (Q) without prosody

(23) *Wh*-adverbial of the main clause
Zhangsan shenmeshihou **juede** [ta-ziji shangdang-le]
Zhangsan when think himself be-fooled-PERF
i. *'Zhangsan felt that he was fooled sometime/once.' (*∃)
ii. 'When did Zhangsan feel that he was fooled?' (Q) without prosody

Wh-object *shei* 'who' in (19), *wh*-subject *shei* 'who' in (20) and *wh*-adverbial *zai nali* 'where' in (21) are located in the embedded clause and are in the c-command domain of a non-factive verb in each sentence. Thus, they appear within an ambiguous licensing context and they are ambiguous between an existential reading and an interrogative reading. Each of these two readings needs a corresponding prosodic contour. *Wh*-subject *shei* 'who' in (22) and *wh*-adverbial *shenme shihou* 'when' in (23) of the main clause are located outside the c-command domain of the non-factive verbs and therefore, they can only get an unambiguous Q-reading. Since this Q-reading is the default interrogative reading of the relevant *wh*-words themselves, it does not require any specific prosodic contour to be associated with. A licensing context containing the verb *pa* 'be afraid of' behaves in a similar way, as shown in (24–28).

(24) *Wh*-object of the embedded clause
Ta-baba **pa** [ta zuo-cuo-le shenme]
his-dad be-afraid he do-wrong-PERF what
i. 'His father is afraid that he did something wrong.' (∃) with prosody
ii. 'For what x, such that his father is afraid that he did x?' (Q) with prosody

(25) *Wh*-subject of the embedded clause
Ta **pa** [shei hui da Zhangsan]
he be-afraid who will hit Zhangsan
i. 'He is afraid that someone will hit Zhangsan.' (∃) with prosody
ii. 'For what person x, such that he is afraid that x will hit Zhangsan?' (Q) with prosody

(26) *Wh*-adverbial of the embedded clause
Ta zui **pa** [ni shenme shihou hui likai ta]
he most be-afraid you when will leave him
i. 'He is afraid [that you will leave him sometime].' (∃) with prosody
ii. 'For what time x, such that he is afraid [that you will leave him at x]?' (Q) with prosody

(27) *Wh*-subject of the main clause
Shei **pa** [Zhangsan hui chidao]
who be-afraid Zhangsan will be-late
i. *'Someone is afraid that Zhangsan will be late.' (*∃)
ii. 'Who is afraid that Zhangsan will be late?' (Q) without prosody

(28) *Wh*-adverbial of the main clause
Ta shenmeshihou zui **pa** [ni likai ta]
he when most be-afraid you leave him
i. *'He is afraid sometime [that you will leave him].' (*∃)
ii. 'For what time x, such that he is afraid at x [that you will leave him]?' (Q) with prosody

One more argument in support of the prosodic licensing of *wh*-in-situ comes from so-called islands. Certain islands behave like ambiguous licensing contexts. (29)–(31) illustrate three types of islands for *wh*-movement: complex NP islands, such as the complement clause of noun in (29), the relative clause in (30), and adjunct islands, such as the temporal clause in (31). In Chinese, *wh*-nominals do not give rise to any island effect and the wide scope interrogative reading survives (cf. Tsai 1994; Hu & Pan 2003). In fact, when a *wh*-nominal appears within an island, it can get either an interrogative reading or an existential reading. Both readings require corresponding prosodic contours. Accordingly, these three types of islands behave exactly like any other ambiguous context that we examined.

(29) Complement clause of noun
[Zhangsan da-si-le shenme ren] de yaoyan shi zhende
Zhangsan beat-die-PERF what person DE rumor is true
i. 'For what person x, the rumor that Zhangsan beat x to death is true?'
(Q) with prosody
ii. 'The rumor that Zhangsan beat someone to death is true.'
(∃) with prosody

(30) Relative clause
Zhangsan yudao-le [zuotian zai shangdian-li ba shenme
Zhangsan meet-PERF yesterday at shop-in BA what
da-sui-le] de na-ge ren
break-PERF DE that-CL person
i. 'For what x, such that Zhangsan met the person who broke x into pieces in the shop yesterday?' (Q) with prosody
ii. 'Zhangsan met the person who broke something into pieces in the shop yesterday.' (∃) with prosody

(31) Temporal clause
Zhangsan [kandao shei de shihou] jiu hui lian hong
Zhangsan see who DE moment then will face red
i. 'For what person x, such that when Zhangsan meets x, his face turns red?'
(Q) with prosody
ii. 'When Zhangsan meets someone, his face turns red.' (∃) with prosody

Let me summarize the distribution of the existential reading and the interrogative reading in an ambiguous licensing context. For the ∃-reading, if the *wh*-element is located within the c-command domain of the key-element of an ambiguous licensing context, it is possible for the relevant *wh*-word to get an existential reading and such an ∃-reading always requires a specific prosodic contour to be associated with. In this case, the *wh*-word takes its inherent negative value [−Q]. By contrast, if the *wh*-word is located outside the c-command domain of the key-element, it cannot get the existential reading. As for the Q-reading, if the *wh*-element is located within the c-command domain of the key-element, it is possible for this *wh*-word to get an interrogative reading and this Q-reading requires a specific prosodic contour. If the *wh*-word is located outside the c-command of the key-element, it can also get an interrogative reading; however, in this case, the Q-reading is the inherent default interrogative reading of the *wh*-word itself and such a reading does not require any specific prosodic form to be associated with. In this case, the relevant *wh*-word takes its inherent positive value [+Q]. Figure 5 summarizes this part.

	Within the c-command domain	Outside the c-command domain
∃	yes (+ prosody): prosodic licensing	no
Q	yes (+ prosody): prosodic licensing	yes (−prosody): by its default interrogative reading

Figure 5.

Another way to interpret Figure 5 is that iff a *wh*-word is generated within the c-command domain of the key element of an ambiguous licensing context, such a *wh*-word is considered to be within this context and it keeps its underspecified bi-values [±Q], and therefore, both the ∃-reading and the Q-reading are possible under the prosodic licensing. By contrast, when the relevant *wh*-word is located outside the scope of the key element, such a *wh*-word is not considered to be within this licensing context and in this case, only the weak inherent default positive value [+Q] is activated. Figure 6 gives a general view of the distribution of the ∃-reading and the Q-reading in the three types of contexts that I examined.

		∃	**Q**
Simple context		*	√ (– prosody)
Unambiguous licensing contexts		√ (– prosody)	*
Ambiguous licensing contexts	*Wh* is in the scope of the key element	√ (+ prosody)	√ (+ prosody)
	Wh is outside the scope of the key element	*	√ (– prosody)

Figure 6.

It is not surprising to see that in Figure 6, both ∃ and Q readings have exactly the same distribution in a simple context as in an ambiguous context when the *wh*-word is outside the c-command domain of the key element.

2.4 Arguments from *wh*-topicalization

In the previous section, we observed that unambiguous contexts are quantificationally strong in the sense that on the one hand, they require a *wh*-word to be present in the c-command domain of the key element and on the other hand, they do not permit the relevant *wh*-word to get more than one reading. We have also observed that when a *wh*-word is located in the c-command domain of the key element of an ambiguous context, it can get several possible readings. Tang (1988), Wu (1999), Pan (2011b, 2014, 2015b) argue that in some cases, a D-linked *wh*-phrase can be fronted to the left periphery and that the nature of this fronting is topicalization.

I will not repeat their reasoning here; however, I would like to point out that if this *wh*-phrase is topicalized to the left periphery inside a licensing context, it will be extracted outside the c-command domain of the key element of this context and such an extraction would cause different results in the two types of licensing contexts. Concretely, if a *wh*-phrase is topicalized out of an unambiguous context, the prediction is that the sentence will be ungrammatical since an unambiguous context obligatorily requires a *wh*-word to be in the c-command domain of the key element. However, if the relevant *wh*-phrase is topicalized out of an ambiguous context, the prediction is that the relevant *wh*-phrase is no longer ambiguous between an ∃-reading and a Q-reading; instead, it can only obtain a Q-reading. This interrogative reading does not need any specific prosodic licensor because it is the inherent Q-reading of the *wh*-word itself.

Let us now examine unambiguous contexts. (32) and (33) show that when a *wh*-phrase is topicalized to the left periphery, thus out of the c-command domain of the relevant key elements (i.e. the *yes-no* question particle *ma* and the A-not-A element) of these two sentences respectively, the sentences become ungrammatical. According to Huang (1982), the *yes-no* question particle *ma* and the A-not-A form trigger the existential quantifier at VP level.[12] In (32b) and (33b), after the topicalization of the relevant *wh*-words, the existential quantifier ∃ binds no variable within its scope and the sentence becomes ungrammatical due to a vacuous quantification. On the other hand, the topicalized *wh*-phrases cannot get an interrogative reading either because the sentence cannot be interpreted both as a *wh*-question and as a *yes-no* question simultaneously. Traditionally, it has been described that two different types of illocutionary forces cannot co-exist in the same sentence.

(32) *Yes-no* questions with the interrogative particle *ma*

a. $[_{CP}\,[_{TP}$ Ta $[_{T'}$ chi-le $\exists_x$ [shenme dongxi]$_x$]] ma]?
he eat-PERF what thing $Q_{yes/no}$
'Did he eat anything?' (∃)

b. *$[_{TopP}$ [Shenme dongxi]$_j$, $[_{CP}\,[_{TP}$ ta chi-le $\exists_x$ t_j] ma]]
what thing he eat-PERF $Q_{yes/no}$

(33) A-*not*-A questions

a. $[_{CP}\,[_{TP}$ Ta $[_{T'}$ zuotian yu-mei-yujian $\exists_x$ [shenme ren]$_x$]]?
he yesterday meet-not-meet what person
'Did he meet anybody yesterday?' (∃)

b. *$[_{TopP}$ [Shenme ren]$_j$, $[_{CP}\,[_{TP}$ ta zuotian yu-mei-yujian $\exists_x$ t_j]]]
what person he yesterday meet-not-meet

12. Huang (1982) shows that the subject in the position of [Spec, IP] can never get an existential reading. Thus, he assumes that the existential quantifier cannot scope over the subject and that ∃ cannot be higher than VP.

The same result is obtained in the context containing the verb *haoxiang* 'seem'. In (34b), *wh*-phrase *zai shenme difang* 'at what place' is topicalized out of the scope of *haoxiang* 'seem', the sentence becomes ungrammatical.

(34) a. $[_{TP}$ Ta $[_{T'}$ haoxiang $\exists_x$ [zai shenme difang]$_x$ xue-guo fayu]].
he seem at what place study-EXP French
'Il seems that he had already studied French somewhere.' (∃)

b. *$[_{TopP}$ [Zai shenme difang]$_j$, $[_{TP}$ ta $[_{T'}$ haoxiang $\exists_x$ t_j
at what place he seem
xue-guo fayu]]]
study-EXP French

Let us turn to *dou*-quantification. *Dou* 'all' is treated as a universal quantifier which has a strong quantificational force and it scopes over the variable on its left.[13] A prediction is that if we topicalize the *wh*-phrase out of the scope of *dou* 'all', the sentence will be ungrammatical due to a vacuous quantification. However, the grammaticality of (35b) seems to suggest that this prediction is wrong.

(35) a. Ta shenme dongxi dou xihuan chi.
he what thing all like eat
'He likes eating everything.' (∀)

b. [Shenme dongxi]$_j$, ta t_j dou xihuan chi.
what thing he all like eat
'He likes eating everything.' (∀)

Even though *wh*-phrase *shenme dongxi* 'what thing' is topicalized to the left periphery, the sentence is still grammatical and it seems that the above prediction is not borne out. The scope of the universal quantifier *dou* 'all' is its left side; however, the left boundary of the scope of the *dou*-quantification is not syntactically marked. Therefore, when the relevant *wh*-phrase is topicalized, it is still not clear whether it completely moves out of the scope of *dou* 'all'. In fact, the full form of the so-called *dou*-quantification is *wulun…dou* 'no matter…all' and the presence of *wulun* 'no matter' is not obligatory. Lin (1996) discusses in great detail the semantics of *wulun* 'no matter'. In syntax, I suggest that *wulun* 'no matter' should be treated as the marker of the left edge of the scope of *dou* 'all'. One possible account for the grammaticality of (35b) is that even if the *wh*-phrase is topicalized, it still stays on the right side of the implicit *wulun* 'no matter' (cf. (36)). Therefore, such a *wh*-phrase still remains within the scope of *dou* 'all', which is why *shenme dongxi* 'what thing' still gets a universal reading.

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13. The reader can refer to H. H. Pan (2006/2011) for a focus-based semantic account. Meanwhile, Zhang, Li & Pan (2012) also discuss cases in which *dou* associates with an element to its right.

(36) a. (**Wulun**) [shenme dongxi]$_j$, ta t_j **dou** xihuan chi.
no-matter what thing he all like eat
'He likes eating everything.'

b. [(**Wulun**) [shenme dongxi]$_i$ [$_{TP}$ t_i **dou**]
∀

By contrast, if we keep the explicit *wulun* 'no matter' in the original sentence and let the *wh*-phrase topicalize to the left side of *wulun* 'no matter' by forcing this *wh*-word to topicalize completely out of the scope of *dou* 'all', the sentence should be ungrammatical. The ungrammaticality of the sentence in (37) shows that this prediction is correct.

(37) *[Shenme dongxi]$_j$, **wulun** t_j' ta t_j **dou** xihuan chi.
what thing no-matter he all like eat

The observation on *dou*-quantification also confirms the hypothesis that a quantificationally strong licensing context obligatorily requires a *wh*-variable to be present in the c-command domain of the key element of such a context and that this type of context permits only one possible reading of the *wh*-variable. If this *wh*-phrase is topicalized out of the c-command domain of the key element, the sentence will become ungrammatical due to a vacuous quantification. As for ambiguous contexts, when the *wh*-phrase stays in-situ in the c-command domain of the key element, the sentence gets either an existential reading or a question reading, both of which need corresponding prosodic forms, as indicated in the (a) cases in (38–40). When the relevant *wh*-phrase is topicalized out of the c-command domain of the key element of each context, such a *wh*-phrase is no longer ambiguous and it can only get a Q-reading. This Q-reading is its default reading which does not require any specific prosodic form, as indicated in the (b) cases.

(38) Negation

a. Ta yi-ge ren **bu** gan qu *shenme difang*
she one-CL person not dare go what place
i. 'She dare not go anywhere alone.' (∃) with prosody
ii. 'For what place x, such that she dare not go to x alone?'
(Q) with prosody

b. [Shenme difang]$_j$, ta yi-ge ren **bu** gan qu t_j
what place she one-CL person not dare go
i. *''There is some place x, such that she dare not go to x alone.' (*∃)
ii. 'What place is the one that she dare not go to x alone?'
(Q) without prosody

(39) Probability adverbs
  a. Tamen-lia **kending** hui qu *shenme difang*
  they-two certainly will go what place
    i. '(Since you are not at home with them), they will certainly go somewhere together.' (∃) with prosody
    ii. 'Where will they certainly go together?' (Q) with prosody
  b. [Shenme difang]$_j$, tamen lia **kending** hui qu t_j
  what place they two certainly will go
    i. *'There is some place x, such that they will certainly go to x.' (*∃)
    ii. 'What place is the one where they will certainly go together?' (Q) without prosody

(40) Non-factive verbs
  a. Dajia dou **juede** [Lisi zuotian qu-guo shenme difang]
  everyone all think Lisi yesterday go-EXP what place
    i. 'Everyone thinks that Lisi went somewhere yesterday.' (∃) with prosody
    ii. 'Where does everyone think that Lisi went yesterday?' (Q) with prosody
  b. [Shenme difang]$_j$, dajia dou **juede** [Lisi zuotian qu-guo t_j]
  what place everyone all think Lisi yesterday go-EXP.
    i. *'There is some place x, such that everyone thinks that Lisi went x yesterday.' (*∃)
    ii. 'What place (x) is the one that everyone thinks that Lisi went to x yesterday?' (Q) without prosody

Note that topicalization of *wh*-phrases can only disambiguate a sentence containing an ambiguous context iff such a movement is not ruled out by locality constraints nor by any other independent restriction; otherwise, the sentence becomes ungrammatical. Here are some examples of the offended cases. For instance, *ba*-sentences also construct ambiguous licensing contexts. A standard *ba*-sentence is given in (41b). The direct object is positioned in a preverbal and post-subject position and is preceded by *ba*.

(41) a. Wo da-sui-le huaping.
  I break-PERF vase
  'I broke a/the vase.'
  b. Wo ba huaping da-sui-le.
  I BA vase break-PERF
  'I broke the vase.'

Let us examine *ba*-sentences with *wh*-phrases.

(42) a. Zhangsan **ba** shenme dongxi da-sui-le
Zhangsan BA what thing break-PERF
i. 'Zhangsan broke something into pieces.' (∃) with prosody
ii. 'What did Zhangsan break into pieces?' (Q) with prosody
b. *[Shenme dongxi]$_j$, Zhangsan **ba** t_j da-sui-le?
what thing Zhangsan BA break-PERF
c. [Shenme dongxi]$_j$, Zhangsan **ba** ta_j da-sui-le?
what thing Zhangsan BA it break-PERF
i. *'Zhangsan broke something into pieces.'
ii. 'What did Zhangsan break into pieces?' (Q) without prosody

When the fronted *wh*-phrase *shenme dongxi* 'what thing' in (42a) appears under the scope of *ba*, it is interpreted either as 'something' or as a question word 'what'. When the *wh*-object is topicalized further to the left periphery, *ba* is stranded; since Chinese does not permit any preposition stranding, the sentence becomes ungrammatical, as shown in (42b). The sentence can be saved if a resumptive pronoun is inserted as a last resort in the position of the trace left by the topicalized *wh*-phrase, as indicated in (42c) (also cf. Pan 2016a, b). In this case, the *wh*-phrase only obtains an interrogative reading without any specific intonation contour. Under the current analysis, this is the default Q-reading of the *wh*-phrase itself.

In the previous section, I show that some islands behave as ambiguous contexts. In (43), if *wh*-phrase *shenme ren* 'what person' is topicalized out of a complement clause of noun, the sentence becomes ungrammatical since this movement violates locality constraints.

(43) Complement clause of noun
a. [Zhangsan da-si-le shenme ren] de yaoyan shi zhende
Zhangsan beat-die-PERF what person DE rumor is true
'For what person x, the rumor that Zhangsan beat x to death is true?'
(Q) with prosody
'The rumor that Zhangsan beat someone to death is true.'
(∃) with prosody
b. *[Shenme ren]$_j$, [Zhangsan da-si-le t_j] de yaoyan
what person Zhangsan beat-die-PERF DE rumor
shi zhende
is true

In this section, I discuss some arguments based on *wh*-topicalization to support my analysis. As demonstrated, there is a close relationship between the distribution of ∃ and Q readings of a *wh*-phrase on the one hand and the c-command domain of the key element of the ambiguous contexts on the other hand.

3. Theoretical consequences

3.1 The cases that the prosodic licensing does not look into

Prosody works as a last resort to disambiguate *wh*-nominals in ambiguous licensing contexts. *Wh*-nominals, as such *shenme* 'what', are pure variables which need to be bound by an operator. Instead of directly triggering a specific operator to bind an in-situ *wh*-nominal as a variable, a licensing context only activates underspecified features [±Q] of such a *wh*-word. It is the corresponding prosodic form that triggers a specific operator, such as ∃ or Q. As a result, prosody only disambiguates the case as a last resort. I also demonstrated that prosodic licensing of *wh*-in-situ even works for island constructions. Example (44) illustrates a well-known ECP effect: when the *wh*-adjunct *weishenme* 'why' is embedded within a complex-NP island, the relevant sentence is ungrammatical. This example was taken to be as evidence in favor of an LF-movement analysis of *wh*-adjuncts in Huang (1982).

(44) *Ni xihuan [$_{NP}$ [$_{CP}$ [$_{TP}$ Lu Xun weishenme xie] de] shu]?
you like Lu Xun why write DE book
('For what reason x, such that you like the book [that Lu Xun wrote for x]?')

If prosody functions as a last resort, a natural question is why a prosodic contour cannot save the sentence from the violation of locality conditions in (44). In other words, why cannot prosody work for *wh*-adjuncts? As suggested in Tsai (1994), a *wh*-adverb is itself an operator and undergoes LF-movement to the scope position and this movement cannot cross any island boundary. (44) is ungrammatical because the movement of *weishenme* 'why' crosses the complex-NP island boundary. The function of prosodic licensing is to introduce a specific operator to bind a *wh*-variable by providing it with a specific reading. However, being an operator itself, a *wh*-adverb does not need to be bound by any other operator or to get a specific reading from another operator. In my analysis, a *wh*-adverb does not bear underspecified features but bears a single feature with a positive interrogative value [+Q]. In any type of licensing context, ambiguous or unambiguous, it is always the default interrogative reading of a *wh*-adverb that is activated. This Q-reading is either properly interpreted when locality constraints are obeyed or is blocked by islands. Therefore, (44) does not need any prosodic licensing and it represents a case that prosodic licensing cannot look into. This is the reason why prosody cannot save the relevant sentence.

3.2 Last-resort status and interpretative redundancy

Another important point in my analysis is that being a repair mechanism, prosodic licensing is tolerated by the computational system because this mechanism does not create any interpretative redundancy. Each combination of the lexicon with a certain phonological feature constructs a unique set which corresponds to an unambiguous semantic output. In this sense, there are no two different phonological features which give the same semantic output. When a certain prosodic form is used, it ensures that one and only one semantic interpretation is obtained at the C-I component. Since prosody does not create any interpretative redundancy, its last resort status is justified and it is of course tolerated by the computational system.

3.3 How is my analysis compatible with the previous ones?

An important question that I must answer is in what way my analysis is compatible with the previous analyses of *wh*-in-situ in Chinese. Let us begin with the Clausal Typing hypothesis of Cheng (1991). This hypothesis requires that the type of each clause should be morpho-syntactically indicated overtly. To type a *wh*-question, either the *wh*-word overtly moves to the scope position at syntax (i.e. languages like English) or a typing particle is inserted in the scope position to bind the in-situ *wh*-word as a variable (i.e. languages like Chinese). This hypothesis implies that ambiguity at the level of interfaces is not permitted in that each unique semantic output should be associated with a single syntactic form. This hypothesis provides us with a way to establish a mapping between the interrogative interpretation and a specific syntactic sentence type. What my proposal suggests is that in addition to the morpho-syntactic typing, the prosodic typing should also be taken into consideration with regard to Clausal Typing. If we take the combination of the stress with sentence intonation as a part of the Lexicon inside the Lexical Array, then the corresponding phonological features behave exactly like sentence typing particles in the original sense of Cheng (1991). Therefore, in an ambiguous licensing context, the sentence containing an in-situ *wh*-nominal can be typed by prosody either as a question or as an ordinary declarative sentence with an existential reading of such a *wh*-word. The analysis based on prosodic licensing of *wh*-in-situ is also theoretically supported by the intonation morpheme licensing of *wh*-in-situ questions in French proposed in Cheng & Rooryck (2000). However, the morpho-syntactic typing in the sense of Cheng and the prosodic licensing in my analysis do not have the same status in the computational system in that the former does not function as a last resort but the latter does. One should always bear in mind that neither question-typing particles nor syntactic *wh*-movement deals with the ambiguous cases. What these two typing mechanisms do is only transforming a declarative

sentence into a question. Therefore, they are not considered as saving devices in the sense of last resort. By contrast, the prosodic licensing mechanism in my analysis only deals with ambiguous cases in which the same syntactic form gives rise to several possible semantic interpretations. It is also for this specific reason that the prosodic licensing of *wh*-in-situ only works in ambiguous licensing contexts. What a specific prosodic form does is to avoid undesirable situations in which the potential output of the computational system is still ambiguous at the level of interfaces. Another way to look at Clausal Typing is to treat it as some kind of filter at interfaces. Any sentence which is not typed in this sense will not be interpretable at interfaces. Accordingly, prosodic licensing of *wh*-in-situ in Chinese is necessary and is required by the computational system. The computational system activates prosodic licensing as a repairing system in order to ensure that a single interpretation is obtained as the unique output at LF; otherwise, interface components will filter uninterpretable ambiguous *wh*-sentences.

Let us turn to the unselective Op-binding approach of Tsai (1994), in which in-situ *wh*-nominals are systematically bound by a null Op which is located at the sentential level (i.e. the CP level). This insightful observation on the variable status of *wh*-nominals is also crucial for my prosodic licensing analysis. These two proposals only differ concerning the status of the licensor for the relevant in-situ *wh*-words. Prosodic forms can be treated either as the overt phonetic realization of the relevant operators which bind the *wh*-word as a variable or as the trigger which activates the unselective binder, such as the null Op, in the sense of Tsai (1994).

4. Conclusion

Previous studies on Chinese *wh*-in-situ questions agree on the variable status of *wh*-nominals, which is a crucial start point of my analysis. Nevertheless, the variable status of *wh*-nominals is not enough to explain why they are only unambiguous in certain types of contexts but ambiguous in the others. A distinction has been made between these two types of contexts. In ambiguous licensing contexts, a *wh*-nominal is ambiguous between several possible readings and I discussed in detail the distribution of the ∃-reading and the Q-reading. The fact that in actual conversational situations, speakers use specific stress patterns and prosodic forms to disambiguate such sentences leads me to inquire the function of those prosodic forms in the computational system.[14] Following Reinhart's (2006) system-repairing hypothesis, it is possible to treat the prosodic licensing of *wh*-in-situ as a repair

14. Also see Zhang (2017) for a detailed introduction to the phonology-syntax interface in Mandarin Chinese.

strategy at interfaces. The interpretative ambiguity of the relevant sentence could be due to the imperfection of the system; each prosodic contour combined with a syntactic form gives a single interpretation as output at interfaces. I propose that these prosodic elements are generated as phonological features among other features associated with a given lexical item in the Lexical Array. Since these prosodic features have a semantic effect on the output of the computational system at the C-I component, they satisfy Legibility conditions and therefore, they do not violate the Inclusiveness condition. At LF, these prosodic forms are treated either as the overt realization of the relevant operators or as the trigger of those operators which bind in-situ *wh*-variables by providing them with the corresponding readings. Prosodic licensing of *wh*-in-situ in Chinese also suggests that in addition to morpho-syntax, prosody can also work as a Clausal Typer in the sense of Cheng (1991).

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CHAPTER 7

The V-copy construction in Mandarin

A case temporarily reopened

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The focus of this study is the so-called *verb-copy construction(s)* of Mandarin Chinese, where two (or even more) copies of the same verb surface in a single clause, without any semantic consequence of this multiplicity. This family of constructions has received various analyses in the generative tradition (e.g., Tsao 1987; Huang 1988; Li 1990; Shi 1996; Paul 2002a, Gouguet 2005; Cheng 2007), each with its strengths and weaknesses. In recent years, there emerged some partially converging proposals that build on the minimalist framework of Chomsky (1995, 2000, 2001), and fundamentally agree that in these constructions both VP-level and V-level operations are involved (V-copy is not one construction, but a group of surface lookalikes, with different underlying structures), and syntactic effects are heavily interspersed with semantic/pragmatic and phonetic considerations in a proper account; see: Gouguet (2005), Bartos (2008), Cheng (2007), Tieu (2009). On the other hand, some other recent contributions (Fang & Sells 2007; Hsu 2008) seem to call several assumptions of the earlier analyses into question, and present data neglected by those proposals. The present paper briefly reviews the earlier accounts, examines and mostly refutes the new potential counterarguments, and refines Bartos's earlier analysis to cater for the full range of structural variation involved, by incorporating certain compatible components of Gouguet's (2005) and Tieu's (2009) proposals into it.

1. Preliminaries

The *(family of) verb-copy construction(s)* (henceforth: VCC) in Mandarin Chinese has been an object of scrutiny for quite some time now in modern linguistic literature. Essentially, the hallmark of this construction is the occurrence of two (or sometimes even more) 'copies' of the same verb[1] in a single clause, without any

1. Note that the term 'V-copy' predates the technical term of 'copies' in Chomsky's (1995) minimalist framework, and these two notions are not inherently related to each other, but many

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special semantic consequence of this multiplicity. Such doubling is triggered in contexts where each of the copies of the same verb takes some kind of complement (or other modifier) to its right. No wonder then that many accounts of the grammar of VCC build on what appears to be the primary insight: somehow each of these right-hand-side complements/modifiers strives to be right-adjacent to (some instance of) V, which then triggers some multiplying operation, assigning each of the complements/modifiers to their respective V-copies to their immediate left, catering for their special needs. Taken one step further, this view implies that the operation creating the multiple copies is subject to Chomsky's (1995) notion of Last Resort – it serves the purpose of saving the well-formedness of the construction by an otherwise seemingly superfluous operation. However (as has been argued by Bartos 2003; Gouguet 2005), the clear cases of optionality in applying the VCC render the 'Last Resort' accounts difficult to maintain.

Let us give a quick introductory illustration of the VCC. In (1), the most frequent 'triggering contexts' are shown – clauses in which there is both a postverbal object and a postverbal modifier of some sort: items that are labeled in traditional and textbook grammars of Mandarin as verbal 'complements' (补语 *buyu*; henceforth: COMPL),[2] in particular: complements of frequency, duration (1a), result (1b), and various flavors of 'degree complements': descriptive and resultative (1c):

(1) a. *Lisi* ***kai*** *che* ***kai****-le san ci / san-ge xiaoshi.*
Lisi drive car drive-PRF three times / three-CL hour
'Lisi drove cars three times / for three hours.'

b. *Lisi* ***kai*** *che* ***kai****-lei-le.*
Lisi drive car drive-tired-PRF
'Lisi got tired (by) driving cars.'

c. *Lisi* ***kai*** *che* ***kai*** *-de hen bang / hen lei.*
Lisi drive car drive DE very good / very tired
'Lisi drives cars very well / drives himself tired.'

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particular analyses (including the present one) make use of Chomsky's copy theory in accounting for these multiple V-copies, on the assumption that these 'copies' are semantically non-distinct, hence do not have independent syntactic footing, either. In other words, the multiple pronunciation is essentially a PF-level phenomenon on this view. See Sections 5 and 6 below for further support and detailed discussion.

2. This notion of complement is not related in any way to the notion of (structural or thematic) complement in modern theoretical linguistics, being just a traditionally established class of predicate-level modifiers in Mandarin, some of which are V's/Adj's incorporated into compound verb forms, others are adjuncts, while yet others have actually been proposed to be analysed as structural complements (Y. A. Li 1990; Sybesma 1999; HLL 2009). The reason for sticking to this traditional use of the term here is due to the fact that is handily covers all of the VCC-triggering modifiers.

The general schema of the VCC is thus: **… V+Obj … V+COMPL …**, where the two instances of the verb root are strictly identical – using synonyms or hyponyms/hypernyms will not do. One must make sure not to confuse the VCC with cases where there is no such identity requirement; this is the situation when the two related verbs are not linked to each other in a particular construction. Compare, for example, the intended (but ill-formed) VCCs in (2) with the 'unrelated' cases shown in (3):

(2) a. **Lisi* ***jia*** *che* ***kai****-lei-le.*
Lisi drive$_1$ car drive$_2$-tired-PERF
'Lisi got tired (by) driving cars.'

b. **Lisi* ***kai*** *che* ***jia****-lei-le.*
Lisi drive$_2$ car drive$_1$-tired-PERF
'Lisi got tired (by) driving cars.'

(3) a. *Zai zheli* ***jia*** *che bu rongyi, hen kuai jiu hui* ***kai****-lei le.*
at here drive$_1$ car not easy very fast JIU will drive$_2$-tired CRS
'Here it's not easy to drive, one will get tired driving in no time.'

b. *Suiran* ***jia*** *che bu rongyi, Lisi haishi* ***kai****- de hen bang.*
though drive$_1$ car not easy Lisi still drive- DE very good
'Although it's not easy to drive a car, Lisi nevertheless drives very well.'

As must be clear from the examples and their meanings, VCC is a marked construction, containing a repetition of V that strikes one as 'superfluous', lacking any semantic effect to be associated with it. But what is equally puzzling is that it has a host of (bi- or even trifurcating) well-formedness constraints, partly applicable to a linearized structure, and partly to the semantic representation, of VCC clauses, as will be shown and discussed in subsequent sections in detail, making this construction (family) a prime example of syntax-external considerations constraining the well-formedness of a syntactic construction lying at the *'crossroads' of syntax, semantics, and phonology* ("an optimal solution to legibility conditions", as put by Chomsky (2000: 9)).

2. Some key properties of the V-copy construction

In this section we will list and illustrate the most important syntactic properties of VCC, based on the extensive literature on this topic.[3]

2.1 VCC only occurs when the object is overtly postverbal

Whenever (for whatever reason) the thematic object is removed from its base post-verbal position, VCC is unavailable. The following examples illustrate this with passives (the 'deep' object surfacing as the subject of the clause), topicalization (the object DP has undergone fronting by virtue of serving as the topic of the sentence), and the so-called BA-construction (the object appears before the main verb, preceded by the particle/light verb *ba*):

(4) a. ***Lisi*** *bei Wangwu *(da) da-le san ci.* (*passive*)
Lisi BEI Wangwu beat beat-PRF three times
'Lisi has been beaten by Wangwu three times.'

b. ***Che*** *wo *(kai) kai-le hao ji ci.* (*topicalized*)
car I drive drive-PRF good some times
'Cars I have driven quite a few times.'

c. *Wo ba* ***tamen*** **(da) da-le liang ci.* (*BA-constr.*)
I BA they beat beat-PRF two times
'I beat them twice.'

2.2 With intransitives: Only if the two copies of V are not adjacent (if at all…)

Intransitive verbs hardly ever occur in a VCC, and in the (somewhat marginal) cases when they do, some overt material intervenes between the two copies, in the same way as the object following the first copy in the canonical cases does:[4]

(5) ?*Wangwu* ***tang*** **(keneng)* ***tang****-le wushi fen zhong.*
Wangwu lie maybe lie-PRF fifty minute time
'Wangwu *(possibly) lay around for fifty minutes.'

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3. A thoroughgoing discussion of all properties would obviously exceed the space limitations of this study, so only those properties are discussed that are relevant and important w.r.t. the analyses discussed here. The interested reader is referred to, e.g., Li & Thompson (1981: 442–450), Tsao (1987), Tai (1999), for more details.

4. See also Hsu (2008: 648–649, fn.11)

One may speculate that the scarcity of intransitive VCC is due to the impossibility of having two adjacent V-copies, so one only ever expects such aVCC when there is some intervening adverbial ensuring this non-adjacency, and the non-occurrence of VCC with adjacent copies may in turn be attributed to some sort of 'haplology' effect, barring two identical copies pronounced one after the other. To the extent that intransitive VCCs exist and are acceptable, though, they strongly disfavor the functional account of VCCs appealing to the dual licensing requirement of object and COMPL via right-adjacency to V, as in these sentences the first V-copy licenses nothing this way, so it would then be ruled completely redundant (hence ungrammatical).

2.3 Asymmetry 1: V+Obj behaves as a constituent, while V+COMPL does not

It has been established in the literature that there are (at least) three important ways in which the status of the two copies of V, along with the two phrases that follow them (the object and the COMPL, respectively), is not on a par, i.e., there are asymmetries displayed. One of these is that while 'V+Obj' readily shows itself as a syntactic constituent, 'V+COMPL' doesn't. E.g., the 'V+Obj' unit can be fronted to different positions in the clause structure (Tang 1990: 98): (6a, c), but the 'V+COMPL' sequence cannot: (6b, d):

(6) a. {***Kan shu***} *wo* {***kan shu***} *keyi* {***kan shu***} *kan san tian.*
read book I read book can read book read three day
'I can read books for three days.'

b. {****Kan san tian***} *wo* {****kan san tian***} *keyi* {****kan san tian***} *kan shu* {***kan san tian***}.

c. {***Kai che***} *ta* {***kai che***} *kai-de hen bang.*
drive car he drive car drive-DE very good
'He drives cars very well.'

d. {****Kai-de hen bang***} *ta* {****kai-de hen bang***} *kai che* {***kai-de hen bang***}.

2.4 Asymmetry 2: The order of the two copies along with their complement domains (i.e., V+Obj and V+COMPL) is fixed, not reversible

The examples in (6), as well as (7) below, further show that the two 'V+something' blocks are invariably asymmetrically ordered: in aVCC clause with both a 'V+object' and a 'V+COMPL' sequence, they always occur in this order, never the reverse one.

(7) *Lisi kai-de hen bang/lei kai(-le) che cf.(1c)
Lisi drive-DE very well/tired drive(-PRF) car
intended: 'Lisi drives cars very well / drives himself tired.' = (1c)

2.5 Asymmetry 3: Only the second occurrence of V is 'active' for aspectualization

Of the multiple instances of V, only the second/last one has the potential of displaying aspect-marking:

(8) *Lisi kai(*-**le**) che kai (-**le**) san ci.*
Lisi drive-PERF car drive-PERF three times
'Lisi has driven cars three times.'

Another respect in which only the last V is 'active' is negation: although negation in general is rare in VCC for pragmatic reasons (Paul 2002a: 145ff), in the particular cases where it is appropriate, it always affects the second copy (V_2), not the first one (V_1) (Paul 1988: 20, 2002a: 146):

(9) *Ta* {****mei***} *kan shu* {***mei***} *kan san tian, zhi kan-le yi tian.*
he NEG read book NEG read three day only read-PRF one day
'He hasn't read for three days, but only for one day.'

Moreover, most auxiliaries can only appear before V_2, though the pattern is complex, with certain auxiliaries going before V_1, especially on their epistemic reading. For some discussion and data see Paul (2002a: 146ff).[5]

2.6 Obligatory vs. optional VCC

The obligatory vs. optional application of the VCC displays an intricate pattern, depending on several factors. While with certain types of COMPL VCC is the only grammatical option, other types simply allow it as one of the possible ways of expression, but under certain circumstances, VCC is mandatory even with these COMPLS. This subsection presents an overview of the pattern.

5. Paul (2002a) also makes the point that predicate-level adverbs target the domain of V_2, too – a point I will omit here, partly because it does not bear directly on the present proposal, and partly because the syntax of adverb placement in Mandarin is still not satisfactorily clear, in general.

2.6.1 *VCC is optional with complements of result (RES)*

(10) *Lisi kai-lei-le che.*
Lisi drive-tired-PRF car
'Lisi got tired (by) driving cars.'

cf. (1b) *Lisi **kai** che **kai**-lei-le.*
Lisi drive car drive-tired-PRF
'Lisi got tired (by) driving cars.'

As shown by (10), with RES there is always a choice of using either the VCC, or simply placing the object DP after the V-complex comprising the main verb, RES (which is an incorporated V/Adj, raised out of a resultative AP/VP or small clause in the complement domain of the main V,[6] in this particular case: *lei* 'tired'), and any aspectual affix. In a 'functional/licensing' account this can be put down to the fact that V+RES(+ASP) form a single (albeit complex) verb, which can license any right-adjacent object the way any transitive verb can in Mandarin in general.

2.6.2 *V-copy is obligatory with degree complements (DEG)*

In sharp contrast to the case of RES, another type of COMPL, namely the 'degree complements' (DEG), whether descriptive ('manner') or resultative, leave no alternative to the VCC – there is simply no other grammatical form of these sentences. VCC is truly obligatory with them, indeed with a flavor of 'last resort'. Compare (1c), repeated here, with the attempted but failed non-VCC variants in (11).

(1c) *Lisi **kai** che **kai** -de hen bang / hen lei.*
Lisi drive car drive DE very good / very tired
'Lisi drives cars very well / drives himself tired.'

(11) a. **Lisi kai-de hen bang/lei che.*
Lisi drive-DE very good/tired car
intended: 'Lisi drives cars very well / drives himself tired.'
b. **Lisi kai-de che hen bang/lei.*

The classic explanation for such behavior assumes that DEG must be introduced by the particle *de*, which must attach directly to V as a clitic, and this leaves the object removed from the vicinity of V, hence 'unlicensed'. Providing an extra copy of V resolves this, by making it possible for DEG and the object to both be right-hand neighbors of V at the same time.

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6. On the syntax of the resultative complement as a small clause predicate see Sybesma (1999).

2.6.3 *With durative/frequency complements: VCC is obligatory if Obj is a weak definite, but optional otherwise*

The most intriguing case is that of the durative (DUR) and frequency (FREQ) complements: with these, (i) the optionality/obligatoriness of VCC hinges on the quality of the object nominal: weak indefinite objects require the application of VCC: compare (12) with (1a), while referentially strong ones allow for a non-VCC alternative, as well: (13);[7] moreover, (ii) even for the weak indefinites there is an escape from VCC in the form of an even quirkier construction: the *pseudo-modifying construction*, which creates a quasi-constituent of DUR/FREQ "modifying" the object bare nominal as an 'honorary' determiner (see esp. Sybesma 1999: 110ff, HLL 2009: 91ff.): (14).

(12) a. **Lisi kai(-le) **che** san ci / san-ge xiaoshi.*
Lisi drive-PRF car three times / three-CL hour
'Lisi drove cars three times / for three hours.'

(1) *Lisi **kai** che **kai**-le san ci / san-ge xiaoshi.*
Lisi drive car drive-PERF three times / three-CL hour
'Lisi drove cars three times / for three hours.'

(13) a. *Lisi kai-le **na/mei-bu** **che** san ci / san-ge xiaoshi.*
Lisi drive-PRF that/each-CL car three times / three-CL hour
'Lisi drove that/each car three times / for three hours.'
b. *Lisi kai **na/mei-bu che** kai-le san ci / san-ge xiaoshi.*

(14) *Lisi kai-le [san ci / san-ge xiaoshi che] le.*
Lisi drive-PRF three times / three-CL hour car MOD
'Lisi drove cars three times / for three hours.'
(lit. 'Lisi has driven three times' / three hours' [worth of] cars.')

3. An overview of earlier accounts

There have been numerous proposals in various theoretical frameworks,[8] even within the variants of the Principles & Parameters general approach of syntactic theory. A complete enumeration being impossible here, I will just briefly review the most influential ones.

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7. This issue is discussed in detail in Paris (1988) and Gouguet (2005).

8. Since the present paper seeks an account of the VCC in 'formalist' terms, I am not concerned with proposals couched in entirely different approaches to grammar, such as functionalism. Notable functionalist and cognitive treatments of the problem are C.-R. Huang (1985) and Tai (1989, 1999), among others.

3.1 Analyses in government/binding theory and early Minimalism

C.-T. J. Huang (1982) tried to capture the 'competition' effect mentioned above by a phrase structure well-formedness filter called the *Phrase Structure Condition (PSC)*, which allowed only a single postverbal constituent within V', so the rescue strategy in this early GB-theoretic model was to create two V' domains, using two copies of the same V, one for each inescapably postverbal complement-like item (object and COMPL).[9] Interestingly, while the technical frame of Huang's analysis went down the drain with the demise of GB-theory, the spirit of the proposal was quite close to the heart of the emerging Minimalist framework (competition, strict binarity, copies of categories), so the leading idea has been incorporated into most subsequent Minimalist treatments of VCC.[10] However, Huang's proposal has faced serious empirical challenges. In general, it was not easy to maintain the full force of the PSC *vis à vis* other constructions with more than one postverbal constituent (e.g., double-object constructions, as well as some instances of the VCC, like (13a, b) above). And with respect to the VCC, the ordering and constituency asymmetries (6, 7), as well as the cases of optionality (like (13)) are not accounted for, as Gouguet (2005) pointed out.

Y. A. Li (1990) devised another GB-theoretic account, placing the issue of Case licensing in the focus, essentially claiming that the rationale of copying V is to provide both the object and the COMPL with accusative Case. Again, there is no explanation for the asymmetries shown in 2.3–2.5 above, or for the optionality of the type in (13).

Tang (1990) proposed that the V+object unit is base generated independently of the other (copy of) V, higher up in the extended projection line of VP (sometimes quite high up, cf. (6)), and functions as a domain adverbial, setting the "domain frame" within which the predicate holds of the subject.[11] While the idea of domain adverbial creation is worth maintaining, there is a serious burden on all base-generation executions: What requires/ensures the identity of the two (or more) verbs occurring in a VCC? In fact, some (e.g., C.-R. Huang (1985), Shi (1996)) have argued that there is no such requirement: you can have a 'VCC' with

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9. C.-T. J. Huang (1992) refines the analysis using a referential hierarchy to (partly) account for the variable behavior of nominals with different referential strength, but the essential insight of the account remains the same.

10. In particular, Cheng's (2007) idea of 'reprojection' is a Minimalist orchestration of Huang's solution.

11. A similar idea was put forth by C.-R. Huang (1985, 1990) in a functionalist context.

non-identical verb forms, some salient logical relation between the participant verbs is sufficient for legitimate 'VCCs' (both examples from C.-R. Huang 1985):

(15) a. *Ta **qi** ma **shuai**-de bi qing lian zhong.*
he ride horse fall-DE nose blue face swollen
'His face got all bruised from falling while riding a horse.'
b. *Ta **mai** ma **shu**-le 10,000 yuan.*
he sell horse lose-PRF 10,000 yuan
'He lost 10,000 yuan selling horses.'

However, the apparent counterexamples contain no VCC at all: what they constitute is another (more loosely organized) construction, with a base generated domain adjunct, which co-exists beside genuine VCCs. As can be observed, (i) the alleged VCC domain adverbials in these sentences are of a less restricted type: they can easily be turned into (e.g.) a time adverbial: (15a′), cf. also the temporal reading ("***while*** riding") of the adjunct in the original (15a), and (ii) such sentences do not conform to the general pattern of VCCs in other respects, either: for example, (15b) does not contain any kind of COMPLS, which would be a hallmark of a VCC.

(15) a′. *Ta [qi ma **shi**] shuai-de bi qing lian zhong.*
he ride horse time fall-DE nose blue face swollen
'His face got all bruised from falling **at the time of** riding a horse.'

Note, moreover, that no such example has been put forth (and can be constructed) with COMPLS of result, duration, or frequency, and that the ill-formedness of genuine VCC examples displaying the identity requirement, like those in (2), are difficult (if not impossible) to explain under the independent base generation scenario, in any case.

Paul (2002a) offered a Minimalist technical analysis for the VCC in which V-copying arises by providing phonological support for an empty proxy head[12] posited 'sandwiched' between TP and VP in the Mandarin phrase structure, the primary function of which is to provide a projection domain where a fissioned (categorial) feature of V can be checked. While Paul's analysis is the technically most detailed, best wrought-out one, it introduces way too many technical specialties to deal with all aspects of the construction, many of which are not part of the (sort of) standard minimalist machinery (the notion of proxies, the Single Checking Hypothesis, the abstract categorial feature of V (independent of, hence checked by, the lexical verb), to name but a few). Furthermore, despite the already complex technicalities, it still remains to be ensured in this account that the filler of the proxy head be the same lexical verb as the one heading the VP below the

12. 'Proxy' in the sense of Nash & Rouveret (1997).

proxy domain.[13] Finally, Paul leaves the DEGREE type of VCC completely out of her analysis (reasoning that it is a rather different construction).

3.2 Some recent non-unitary Minimalist analyses

In the past decade, the idea that VCC phenomena cannot receive a unitary treatment emerged in a handful of new accounts phrased within the framework of Chomskyan Minimalism. I wish to briefly introduce those three that (I believe) can be put on convergent paths, so that a final Minimalist analysis can be arrived at in the future. In fact, I intend the present paper as a first step along this road.

As far as I can tell, the first two to propose that 'V-copying' in VCC does not always/necessarily mean moving/copying just V itself, but involves the movement/copying of a larger, phrasal unit (some VP) in syntax, were Bartos (2003) and Gouguet (2005). On that view, the 'V+object' unit in a VCC is created by copying the lowermost VP (comprising just V and its most deeply merged structural complement, i.e., the object NP/DP) to the left edge of *v*P, and it is an effect of linearization, reflected at the level of phonetic form (PF), that both copies of V get pronounced, while the object nominal is only pronounced in the higher chain link of the copied VP. They key difference between Bartos's and Gouguet's account was that while Gouguet maintained that this is what happens in *all* cases of VCC, Bartos (2003, 2006) proposed a dual analysis: VP-copying with certain COMPLS (DUR and FREQ) vs. the more 'traditional' V^0-level operation with others (DEGREE).

At the same time, both Bartos (2003: 2006) and Cheng (2007) proposed *not* to treat all VCCs in a unitary fashion: Bartos (as just mentioned) saw a V-copying/VP-copying bifurcation in the patterns, while Cheng suggested that V-copying is V-raising accompanied independently by object-raising in some cases, but sideward movement of V, followed by merging this V with its DP object in a separate workspace, and subsequently freely re-inserting the emerging [V+Obj] unit back into the 'main' phrase structure, somewhere in the IP-domain.

These proposals sought to answer the questions and solve the problems troubling the earlier accounts, with some success. However, none of them were perfectly successful at that: Bartos's analyses left the asymmetries shown in 2.3 and 2.5 above unaccounted for; Gouguet did not have sufficient motivation for copying

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13. Especially so if there is good reason to prefer 'Merge over Move' (Chomsky 1995, 2000; though see Boeckx & Grohmann 2007), on grounds of economy, since then one expects there to be derivations where there is another V available in the Numeration (or directly from the lexicon), and thus instead of moving (copying) the lower lexical V, this other V will be introduced into the structure at the proxy head via Merge.

the VP (= 'V+object') upwards;[14] and Cheng resorted to a mechanism (sideward movement) lying outside the mainstream versions of Minimalist syntax. But even to the extent that they did have explanations for the data patterns discussed in Section 2, they (along with all earlier Chomskyan analyses) have been called into question by two recent papers (Fang & Sells 2007; Hsu 2008), while a third one (Tieu 2009) provided fresh insights – which necessitates a reassessment and reworking of Bartos's, Gouguet's and Cheng's models, and this might be a good occasion to attempt a unification of the insights and advantages of those three. In the next sections I first review (and reject) Fang & Sells's and Hsu's arguments against the viability of a Bartos/Gouguet-type of syntactic account, and then propose a refinement of my own earlier model that points towards the direction of a 'final' treatment that may one day attain the desirable unification of the Minimalist analyses of VCC.

4. Some recent contributions, their evaluation, and their yield

Of the three recent papers bearing rather directly on the proper account of the syntax of VCC, the earliest and most critical one is Fang & Sells (2007).

4.1 Fang & Sells (2007) – a general critique of Chomskyan accounts

Fang & Sells present new types of data that they believe undermine (most) analyses put forth within the Chomskyan frameworks in the past decades, and then go on with a new proposal in terms of LFG.[15] At the heart of their own proposal lies the idea that VCC is essentially coordinative, i.e., the 'V+XP' strings are conjoined units, rather than hierarchically configured ('subordinative'). However, apart from introducing some genuinely interesting types of VCC which have gone hitherto unnoticed, and which pose real problems for the analyses reviewed in the previous section, their proposal largely rests on a misinterpretation of the data.

Probably the most intriguing set of data they cite is about the applicability of VCC to ditransitive predicates. As (16a) shows, in such cases the 'V+object' unit

14. He speculated that it must be a case of object shift (in the mood of Soh 1998) pied piping V. However, the fact that intransitives can form VCCs (albeit in a very restricted way; cf. (5)) obviates this possibility immediately.

15. Fang & Sells present some diachronic data, too, which lie completely outside the concerns of the present paper, but (i) the handling of those data is blatantly speculative, positing 'commas', 'pauses', 'pro-drop', etc. with regard to written vernacular texts, where (obviously) none of these concepts are marked in any form; (ii) even disregarding their speculative parses of the data, these examples do not present any challenges to my current proposal.

comprises the V with both of its objects: 'V+obj1+obj2'. But what really complicates matters is that unlike with monotransitives in VCCs, where the object nominal is not extractable from the 'V+object' unit (16c), in the ditransitive cases (at least) obj2 can undergo extraction, such as topicalization: (16b).

(16) a. *Wo* [*song ta zhe-jian liwu*] *song-de hen hao.*
I give he this-CL present give-DE very good
'I gave him this present, [and it turned out to be] very good.'

b. *Zhe-jian liwu, wo* [*song ta ~~zhe-jian liwu~~*] *song-de hen hao.*
– extraction: OK; cf.:

c. **Zhe-bu che, wo* [*kai ~~zhe-bu che~~*] *kai-de hen bang.*
this-CL car I drive drive-DE very good
'This car, I drive very well.'
– extraction: *

If the 'V+object(+object2)' string is an adjunctive constituent in a VCC, sitting on a left branch, then all standard Chomskyan accounts are doubly at a loss: firstly, the extraction in (16b) violates a standardly assumed constraint, the Condition on Extraction Domains (CED, C.-T. J. Huang 1982), barring movement out of an adjunct. Secondly, even if it were somehow possible to circumvent the CED, the same strategy should be equally applicable to monotransitives, as well, so we would then be left without an explanation for the ill-formedness of cases like (16c).

Furthermore, Fang & Sells (2007) observe a pattern of VCC not discussed in the literature previously, in which there is no 'V+object' unit at all, just two (or more) 'V+COMPL' units: (17a). And in fact, the two patterns can be combined in such a way that after the 'V+object' unit there are more than one 'V+COMPL' units: (17b).

(17) a. *Lisi* [*wan-le yi-tian*] [*wan-de hen lei].*
Lisi. play-PRF one-day play-DE very tired
'Lisi played for a day and got tired.'

b. *Lisi* [*wan youxi*] [*wan-le yi-tian*] [*wan-de hen lei].*
Lisi play game play-PRF one-day play-DE very tired
'Lisi played games for a day and got tired.'

Fang & Sells analyse VCCs in an LFG-model as coordinative structures: *all* of the [V+XP] units, whether XP is an object or some COMPL, are *conjoined* VPs. They then explain the invariable 'V+Obj' < 'V-COMPL' order by LFG-internal technicalities. Ingenious as this proposal may seem at first sight, it is completely on the wrong track: whereas the double/multiple 'V+COMPL' examples do display clear traits of a coordinative structure (hence they are not VCCs at all, in the strict sense), the 'V+object … V+COMPL (… V+COMPL, …)' construction (i.e., the genuine VCC)

does *not* behave as coordination. In particular, while the double/multiple COMPL construction admits an overt conjunction between the coordinated units, no such item is ever possible between 'V+object' and 'V+COMPL', i.e., within a true VCC:

(18) a. *Lisi* [*wan-le yi-tian*] ***bingqie*** [*wan-de hen lei].*
Lisi play-PRF one-day and play-DE very tired
'Lisi played for a day and got tired.'
b. **Lisi* [*wan youxi*] ***bingqie*** [*wan-le yi-tian*] */[wan-de hen lei].*
Lisi play game and play-PRF one-day /play-DE very tired
'Lisi played games, and did so for a day / got tired.'

Moreover, notice the availability of aspect marking in the first 'V+COMPL' unit in (18a), indicating the symmetry between the two conjuncts, as opposed to the unavailability of aspect marking in the 'V+object' units in (18b), as well as in any other true VCC – recall 2.5. Finally, to the extent that semantic and pragmatic considerations allow,[16] the order of the conjuncts in the fake 'VCC' is reversible: (19), whereas this is never the case for genuine VCCs, as discussed in 2.4.

(19) a. *Lisi* [*wan-le yi-tian*] (***bingqie***) [*wan-de hen hao*].
Lisi. play-PRF one-day and play-DE very good
'Lisi played for a day and had real fun.'
b. *Lisi* [*wan-de hen hao*] (***bingqie***) [*wan-le yi-tian].*
Lisi. play-DE very good and play-PRF one-day
'Lisi had fun playing, and played for a day.'

In sum, Fang & Sells are too hasty to conclude that everything can be subsumed under 'coordination' here.[17] Nevertheless, their new data of genuine VCCs necessitates the reconsideration of others' proposals.[18]

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16. That (18a) is not reversible this way is probably due to some sort of logical sequencing between the COMPLS: Lisi gets tired as the result of his playing for a whole day. Chinese is known to have a very strong tendency for ordering cause before effect, and earlier events before later ones (see Tai's (1985) Principle of Temporal Sequence).

17. See Hsu (2008: 645ff) for further (though not particularly strong) arguments against Fang & Sells (2007).

18. Largely irrelevantly to our concerns here, Fang & Sells account for the facts shown in (16) by (i) having no ban on dependencies similar to the CED in general (hence the well-formedness of (16b)), but (ii) assuming a constraint specific to Mandarin that disallows any VP with just a V, and without any overt internal argument XP – this rules out the 'evacuated' V+object unit in the case of monotransitives. Needless to say, this account is neither directly adoptable into our Minimalist analysis, nor conceptually desirable.

4.2 Hsu (2008): An information structural treatment of VCCs

Hsu (2008) places the analysis of VCC in the wider context of the role of the 'sentence internal domain' in displaying information structural relations in syntax. In particular, the 'copied' unit (V+object) is analysed as a base generated topic of focus in an internal topic/focus position between the TP and *v*P domains, posited following Paul (2002b, 2005). The function of such topics, as Paul (2005) puts it following Chafe's (1976) definition, is to set up "a frame within which a sentence holds", one that limits "the applicability of the main predication to a certain restricted domain" (Chafe 1976: 50–51). This, in turn, is hardly distinguishable from what is meant by 'domain adverbial' à la Tang (1990: 202):[19] "an adjunct indicating a domain concerning an event or action […] setting up a domain frame." In other words, then, Hsu attributes roughly the same function to the 'V+object' unit of the VCC as Tang (1990), and (in her wake) myself, at least in those cases where Hsu generates it as a topic (rather than a focus).

Another important observation is that analyses linking/functionally equating the higher V-copy with the light verb *BA* (把), such as Li (2006), Cheng (2007), are on the wrong track – a higher copy of V and *BA* may cooccur in the same clause, hence it is obvious that they are not alternative lexicalizations of a light verb head:

(20) *Ta* [***xunlian*** *ma*] ***ba*** *ma* [***xunlian***-*de* *hen* *shuncong*].
he train horse BA horse train-DE very obedient
'He trains horses [to be] very obedient.'

However, this 'base-generated TopP/FocP' account Hsu proposes (i) suffers from the general problem of base generating VCCs, i.e., fails to account for the necessary identity of Vs, and (ii) gives no answer to the problem of extraction noted by Fang & Sells (2007).

4.3 Tieu (2009): An extended version of Cheng's (2007) account

Tieu (2009) takes Cheng's (2007) account as the basis, and extends it by relating it to important observations about the aspectual properties of the VCC, and correlations between the categories Asp, *v*, and V. Its main advantage is that it sheds light on the optional vs. obligatory VCC duality in the case of the DUR/FREQ-subtype, depending on the referential nature of the object nominal (weak indefinite vs. else),

19. Note that this is only very loosely and remotely related to Ernst's (2004) notion of 'domain adverb'.

as discussed in 2.6.3 above. Tieu (somewhat similarly to Gouguet's ideas) assumes that the dual pattern is due to the different aspectual import of the two.

For the resultative subtype of DEGREE-VCCs, Tieu accepts Cheng's (2007) analysis, in which two distinct derivations are assigned to the two different attested readings: the 'subject result' one, and the 'object result' one. (21), from Cheng (2007: 160) illustrates these:

(21) a. ***Ta***$_x$ *qi* *nei-pi* *ma* *qi-de* [$_{SC}$ ***e***$_x$ *hen* *lei].* – subject result
he ride that-CL horse ride-DE very tired
'He rode that horse and got tired.'

b. *Ta* *qi* ***nei-pi*** ***ma***$_x$ *qi-de* [$_{SC}$ ***e***$_x$ *hen* *lei].* – object result
he ride that-CL horse ride-DE very tired
'He rode that horse and the horse got tired.'

Cheng (2007) derives the object result reading (i.e., the referential linking of the resultative small clause subject to the object role of the matrix predicate) by raising the object DP from the small clause subject position to the matrix spec,VP for theta- and Case-checking (exactly like object control is implemented in a control-as-movement scenario, cf. Hornstein 1999), and copying the matrix V up to *v*, whereby the 'V object' linear sequence emerges. The lower copy of the raised DP deletes (Chain reduction, Nunes 2004), but both copies of V are retained, being non-identical once the obligatory fusion of its lower copy and the clitic *-de* takes place.

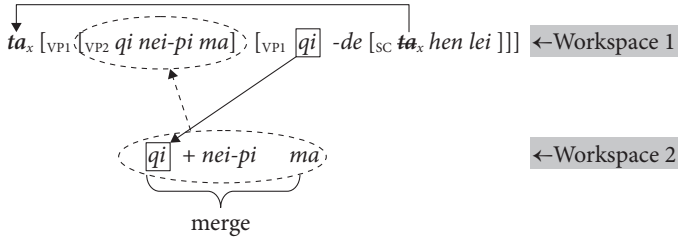
(21) b′. *Ta* [$_{vP}$ *qi* [$_{VP}$ [***nei-pi ma***] *qi -de* [$_{SC}$ [~~***nei-pi ma***~~] *hen lei*]]].

chains: <[*nei-pi ma*], [~~*nei-pi ma*~~]> – chain reduction under identity
< *qi, qi-de* > – no reduction ← no full identity

The subject result reading arises by a completely different derivation: in this case it is the matrix surface subject that originates as the subject of the resultative small clause. A matrix V complemented by a resultative small clause may optionally become ergativized (Hoekstra & Mulder 1990), in which case it will not project any argument in spec,VP. This makes way, on the one hand, for the SC-subject to raise to matrix spec,TP, becoming the matrix subject (hence the referential identity between the subjects of the two predicate domains), and blocks the projection of any object argument of the matrix V, on the other. This is where sideward movement in a multi-workspace setting (Nunes 2004) comes into the picture: the matrix V is copied out of the primary structure, to an empty workspace, where it can merge with an object argument, yielding yet another VP (*qi nei-pi ma* 'ride

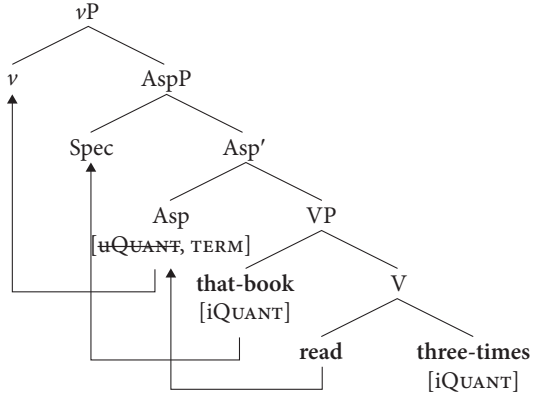
that horse'), which can subsequently merge back into the primary structure, as a VP-level adjunct.[20]

(21) a.



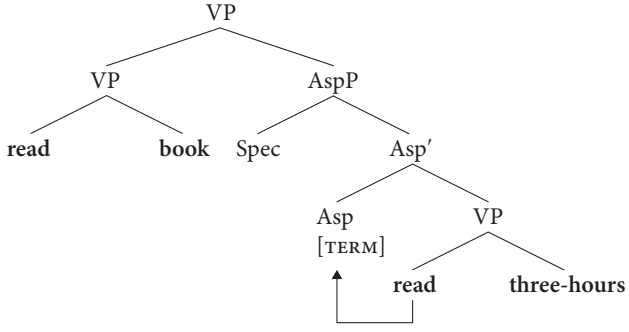
Tieu proposes to extend this dual analysis to the 'manner/descriptive' subtype of DEGREE-VCCs (e.g., (6c)), as well. Furthermore, she makes use of the different aspectual properties of weak and strong nominals, via a syntactic mechanism of aspectual licensing, to analyse their differential behavior in DUR/FREQ-type VCCs. In her account, both definite DPs and frequency phrases quantize the event, and can therefore check a similar feature on Asp (the closer of the two does so); this is accompanied by V moving to Asp (and then possibly on to *v*): (22a). In contrast, weak indefinite DPs/NPs and duration phrases do not do so, so they won't move to the Asp-domain for checking, i.e., in such cases only V raises to Asp (and maybe on to *v*): (22b).

(22) a. *Ta kan na-ben shu kan-le san-ci.*
He read that-CL book read-PRF three-times
'He read that book three times.'



20. Space limitations disallow presenting the analyses in full technical detail; the reader is referred to the original source (Cheng 2007) for that. Also, Cheng observes that for weak object nominals the object result reading is unavailable, and offers an account for that effect, too.

b. *Ta kan shu kan-le san-ge xiaoshi.*
He read book read-PRF three-CL hour
'He read (books) for three hours.'



The derivational duality of weak indefinite vs. strong object applies here, too, as suggested by Cheng (2007), and adopted by Tieu: with a weak indefinite object, where VCC is obligatory, the sideward movement scenario applies, because spec,VP is not accessible for weak NPs. The optional use of VCC with a definite object is problematic for the Cheng/Tieu account, however: since spec,VP is accessible for these objects, sideward movement as last resort won't enter the scene, but then the movement of V will create a chain, within which, if the copies of V are non-distinct, chain reduction inevitably occurs, yielding just the 'V Obj DUR/FREQ' surface order, barring the overt repetition of V. To circumvent this problem, they evoke an allegedly related construction from Ernst (1987), containing the same DUR/FREQ expressions in a (seemingly) different structure, shown in (23b):

(23) a. *Ta kan na-ben shu kan-le san ci.*
he read that-CL book read-PRF three times
'He read that book three times.'
b. *Ta kan na-ben shu **you** san ci le.*
he read that-CL book exist three times CRS
'He has read that book three times.'

Cheng suggests that (23a) contains a covert alterego of the same *you* 'exist' as seen in (23b), which has fused with V (*kan* 'read'), rendering the two copies of V distinct for the purposes of chain reduction.

While the Cheng/Tieu account is successful at deriving the patterns of the RESULT and DEGREE types of VCC, and Tieu's idea to enhance the analyses with the obvious aspectual properties, it has certain problems necessitating further quest for the best treatment of VCCs:

– Sideward movement is not uniformly considered part of the core minimalist machinery (Brody 2006), but even if (and to the extent that) it is, the way it is applied by Cheng is not like the original implementation of the idea (Nunes 2001, 2004): here the sideward moved item is not 'attracted' sidewards to satisfy the requirement of some lexical head, but initiates its own *reprojection*, violating the "target projects" property of movement (assumed to hold by Chomsky 1995, 2000 et sqq.);[21]
– the account of (23a) by way of relating it to (23b) is not credible: for one thing, there is a rather obvious aspectual difference between the two constructions (observe the distribution of the two *le* particles, verbal/aspectual and sentence-final/modal),[22] for another: (23b) has a totally different syntactic structure, with the string preceding *you* constituting a full subordinate clause, serving as a sentential subject for *you*, which is the main predicate of the matrix sentence: (24).[23] And the duration phrase in this construction specifies the number of occasions that state of affairs spelled out in the subject clause stood or the amount of time that has elapsed during (or since, as in (25)) that state of affairs.

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21. The idea that in any instance of movement it is always the target category is the one that projects further, never the moved item, has been more or less tacitly assumed by the mainstream minimalist literature. This is violated by Cheng's analysis, in so far as the V moved out of the original tree starts its own projection in the new tree established by its merging with its complement (cf. Brody 1998 for discussion).

22. On the distinctness of the two homonymic *le* particles see, e.g., Li & Thompson (1981), Sybesma (1999).

23. As (i) shows, sentential negation targets *you* in this construction. This, however, does not constitute a clear argument for the structural difference between this *you*-construction and the VCC, since (as we saw in (9)) the COMPL of a VCC shows certain properties characteristic of main predicates (see also Li 1990: 42ff.). But (ii) vs. (iii) indicate that scope facts draw the line between the two: in a VCC, freq cannot scope over the matrix subject, while in the *you*-construction the frequency predicate does reach above the subject of the embedded subject clause – something unexpected in the Cheng/Tieu analysis:

(i) Lisi kai zhe-bu che mei you san-ci (zhi you yi-ci).
Lisi drive this-CL car NEG exist three-times (only exist one-times)
'Lisi hasn't driven this car three times (but only once).'

(ii) Mei-ge xuesheng dou kai zhe-bu che kai-le liang-ci.
every-CL student all drive this-CL car drive-PRF two-times
'Every student has driven this car twice.' *∃ > ∀

(iii) Mei-ge xuesheng dou kai zhe-bu che you liang-ci le.
every-CL student all drive this-CL car exist two-times CRS
'There have been two occasions of every student driving this car.' ∃ > ∀

(24) a. [$_{TP}$ [$_{CP}$ *Ta kan na-ben shu*] [$_{VP}$ ***you*** *san ci le].*
he read that-CL book exist three times CRS
'It has happened three times that he read that book.'

b. [$_{TP}$ [$_{CP}$ *Ta kan na-ben shu*] [$_{VP}$ ***you*** *san-ge xiaoshi le*].
he read that-CL book exist three-CL hour CRS
'It has been three hours now since he's been reading that book.'

c. [$_{TP}$ [$_{CP}$ *Ta lai Beijing*] [$_{VP}$ ***you*** *san-ge yue le].*
he come Beijing exist three-CL month CRS
'It has been (as much as) three months since he came to Beijing.'

– Finally, the distinction in aspectual import, drawn between durative and frequency phrases by Tieu, does not mesh well with the fact that these two types of COMPL behave alike in VCCs. It is more reasonable to follow Gouguet (2005) in insisting that while durative phrases have mostly not been thought to participate in telicizing the events they modify, given their incompatibility with telic predicates (**Lucy ate up the chicken for two hours*), they nevertheless do possess the ability to delimit an event temporally, measuring out the event, thus from the perspective of aspectual licensing, they are expected to pattern with frequency phrases, *pace* Tieu.

5. The Proposal – Part 1: VCC with DUR/FREQ phrases

In this section and the next one I present my proposal concerning the proper analysis of the different types of VCC, significantly improving on my earlier one (Bartos 2008), partly incorporating some useful insights from recent competing accounts (Cheng 2007; Hsu 2008; Tieu 2009), and partly also addressing the issues raised by Fang & Sells (2007) against Chomskyan treatments in general.

First I focus on VCCs with durative/frequency COMPLS – in this type VP-movement underlies the surface pattern, following original ideas from Bartos (2003, 2008) and Gouguet (2005). The general background is Chomsky's (1995, 2000, 2001) Minimalist framework, where all syntactic movement is conceived of as copying, followed by the subsequent determination of which chain links (copies) are pronounced, i.e., the deletion of certain chain links (chain reduction).

The phrase structure and the relevant operations are depicted in (26) below. Object nominals are merged with V first. The durative and frequency phrases are adjoined to this lowest V-projection (here: VP), in line with HLL's (p. 92ff.) conception.[24]

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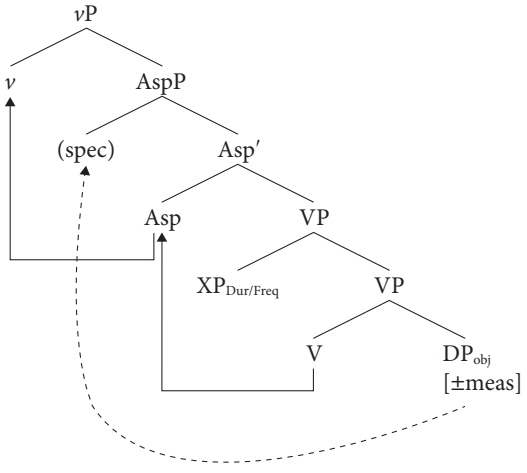
24. In fact, HLL claim that these phrases are adjoined to V', placing the two objects (direct, indirect) in the complement and specifier of V, respectively, with the frequency/duration phrase sandwiched between those. The fact that the 'V+object' unit can be moved is not compatible with the V'-adjunct analysis anyway, and nor is any X' accessible for adjunction in general in Chomsky's

(26)



There are thus two relevant operations involved in any case, whether there is VCC or not: the raising of V, and the movement of certain object nominals to spec,AspP. V obligatorily raises to Asp (and then further to *v*), to pick up any Asp-suffix and to participate in shaping the aspectual properties of the event. Objects behave differentially, in correlation with their relation to aspect, encoded here by the formal feature [meas] ('measuring out' the event): [+meas] object DPs raise to spec,Asp, while [–meas] nominals do not.[25] This immediately yields the following welcome results:

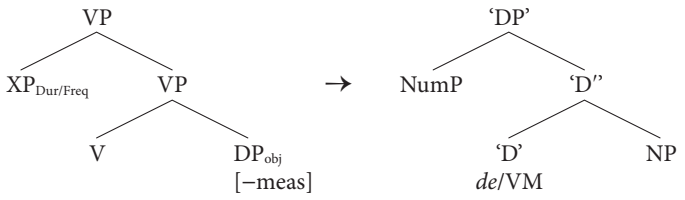
- When no extra material is involved apart from V and its object, there will be no variation whatsoever: whether the object stays in situ or raises to spec,AspP, it will follow V in the linear structure (PF).
- When, on the other hand, a DUR/FREQ phrase is adjoined to VP, the [±meas] property of the object does matter: a [+meas], i.e., referentially strong, object, raised to spec,Asp, will precede the DUR/FREQ phrase, while [–meas] ones will follow it (cf. (13a)). In the latter case, in order to realize the 'measuring out' for Asp, the VP-domain will get reanalysed as a quasi modificational structure which inherits the [+meas] feature inherent in the DUR/FREQ phrase, and fulfils its aspectualizing role with respect to Asp (cf. (14)):[26]

Minimalist model. On the other hand, it is still a matter of question whether movement of a lower segment of an adjunction structure can be targeted by Move. If there is good reason to rule this possibility out then (26) must be modified so that FREQ/DUR is not a VP-adjunct, but a specifier of some FP whose head merges with the lowest VP, similar to Gouguet (2005).

25. The licensing of the object will occur independently of movement, via remote agree, as in Chomsky (2000, 2001).

26. In (27), the use of single quotes on the reanalysed structure denote the occasional ('honorary') nature of the nominality of the whole expression; VM = verbal measure (the same VM unit

(27)



5.1 The nature of VCC with durative/frequency COMPLs

As we have seen in Section 2, VCC is optional in the durative/frequency COMPL construction: if the object is referentially strong ([+meas]), its alternative is the simply derived 'V object COMPL' order, as shown in (26) above, while if the object is weak ([−meas]), its alternative is the reanalysis just depicted in (27). Given that I adopted Tang's (1990) insight about the domain adverbial function of the preposed 'V+object' unit, the obvious factor that determines whether there will or will not be a VCC is the choice whether the formation of such a domain adverbial is called for. If the choice is taken, an operation of Move copies the lowermost VP (= V+object) to somewhere above *v*P (see Paul's (2002a) arguments of adverb placement), yielding structures like (1a), (13a).[27] This extraction of the VP passes through spec,Asp (possibly because VP inherits the [±meas] feature of its daughter DP), precluding the movement of the object phrase to the same location.[28] In this derivation the absence of any aspect marking on the V of the copied 'V+object' unit is guaranteed because what is moved/copied is just the core lexical VP, which in turn is the consequence of this operation being a case of *backgrounding* (cf. the discussion in 4.2, as well as Gouguet's (2005) speculations in the same direction), so the informationally focal durative/frequency COMPL cannot be included in it.

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as the one in the original XP_{freq}), while the particle *de*, whose general role is to link attributive modifiers to the modified nominal projection, appears optionally in this reanalysed structure (at least with duration phrases (HLL. 2000: 96), though maybe with fequency phrases as well (Y. A. Li 1990: 9)).

27. In the strict technical sense this movement must be triggered by some formal feature (the 'generalized EPP' of some adverbial-hosting projection above *v*P), and must pass through (some) spec of *v* to observe phases (in Chomsky's (2000, 2001) sense) – technical details that remain to be worked out, along with a theory of the movement possibilities of adverbial adjuncts in general.

28. This could alternatively be conceived of as the object pied piping the whole VP on its way to spec,Asp (cf. fn. 14). On the other hand, in the case of intransitives (as in (5)), a VP comprising just the V head is copied up, and this need not (hence will not) pass through spec,Asp.

5.2 The determination of pronunciation for the copies

We must now see how the surface pattern of VCC arises, after the syntactic operations have taken place. The default **basic rule of chain reduction** is that within any chain, the copy serving as the highest link is pronounced, with all the other copies 'silenced' (deleted).[29] This is overridden only if something enforces the pronunciation of an extra copy, such as issues of recoverability, and phonetic considerations (Landau 2006).

In our particular case, there are three non-trivial chains whose reduction must be taken care of: the chain of V, the chain of the object (if it moves), and the chain of VP (in the VCC scenario). In the <*v*, Asp, V> chain, the verb is pronounced in its highest link, *v*.[30] In a non-VCC scenario, a [+meas] object DP is pronounced in spec, Asp, that being its highest chain link, which yields a ***V(-prf) Obj dur/freq*** linear order, while a [−meas] object does not move at all, forming just a trivial one-link chain, and is therefore pronounced in situ, with a ***V(-prf) dur/freq Obj*** linear order as the outcome.

If VP-copying is applied, and a VCC is formed, then the VP will also form a non-trivial chain, with links in (at least) the base position, spec,Asp, spec,*v*, and the target position. The chain of V will be exactly like in the non-VCC case, while the object nominal's movement is precluded by the raising of the VP, so its chain will have no link outside the lowest VP. This situation is shown in (28).[31]

There is thus two chains to undergo reduction for pronunciation. In the chain of VP, there is no reason to diverge from the basic rule: the whole copied VP, that is, 'V+object' string will be pronounced in the position of the highest link (in spec,X), and the lower copies (in spec,*v*, if distinct from the target position, as well as in spec,Asp and the base position) will be silenced. The chain of V has three links (in V, in Asp, and in *v*), again, the basic rule leaves the copy in *v* pronounced, and

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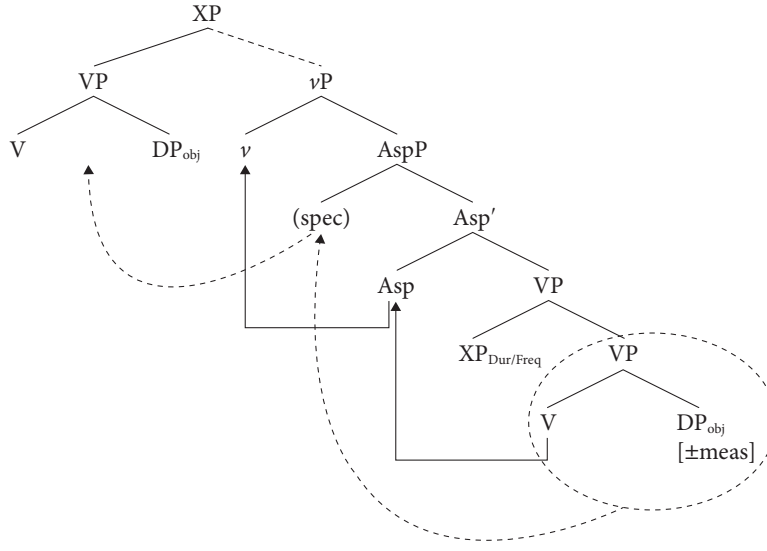
29. This is what is (tacitly or explicitly) assumed by mainstream Minimalism (for some discussion see e.g., Bobaljik 2002; Nunes 2004; Bošković & Nunes 2007).

30. The <V, Asp, *v*> chain may be a simplification, on the traditional view of head movement as successive adjunctions of the involved head categories to the next higher heads, but given that the status of head movement is not properly solved in Minimalist syntax, and that, as far as I can judge now, the current proposal can probably compatible with any actual technical implementation of head movement, I do not dwell on this issue here.

31. The precise identity of of the adjunction site of the copied VP is left unspecified, as (i) it depends on what particular projections there are in the given structure, and (ii) it is variable (the VP can raise either as close as an outer spec of *v*, or as far as the left periphery of the clause, cf. 2.3 above), and the possible intermediate domains between XP and *v*P are left out, represented by the broken line.

(28)



the other copies silent. Interestingly, the movement of the VP has created further 'phantom' copies of V, as a term of the whole moved VP. They, however, are **not** in the head-chain of V, so they do not count in the computation of chain reduction for V.[32] What emerges is a situation with two copies of V (chain-independent of each other) being pronounced, one in its own right as the topmost chain-link of the head category V, the other as a term of the VP forming another, phrasal, chain. Since they do not compete for pronunciation, both can be (and in fact are) pronounced at PF. The result is a ***V Obj … V(-prf) dur/freq*** linear sequence.

5.3 How the basic properties are derived

Let us briefly review how the crucial VCC properties (Section 2) are accounted for:

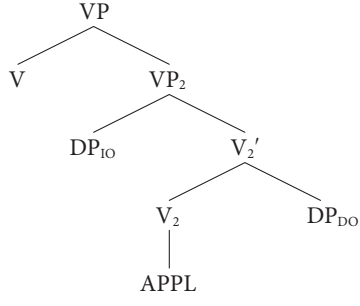
– If V is intransitive (as in (5)), the picture is much simplified: a 'V-only' VP is copied somewhere above the *v*-domain (possibly via spec,*v*), the fate of the copies in the V-chain and the VP-chain is as sketched above: since there is no c-command relation between the two topmost copies, both are deemed to be

32. Since certain copies of the V head-chain c-command certain copies of V inside the raised VP-copies (e.g., V's copy in *v* c-commands the V-copy inside the VP-copy in spec,Asp), one might suggest that forking chains emerge for V. But even in such a scenario, no problem arises because the topmost V-copies (in *v*, and inside the VP adjoined at least as high as spec,*v*) are mutually non-commanding, hence neither is a superior chain-link w.r.t. the other, so neither will cause the other to remain silent.

pronounced.[33] However, if the two verb-copies end up linearly adjacent at PF, in the absence of any linearly intervening material, a rule of haplology 'contracts' them into one (or deletes one of them).

- The 'V+object' unit passes constituency tests – no wonder, since they **are** one constituent, and can end up pronounced at any of different sites (cf. (6)).
- Only the second occurrence of V is aspect-marked, since that is the one chain-linked to the Asp-head, while the copied VP only contains a bare form of V.[34]
- The order of the two 'V+something' units is irreversible, as long as the VP is copied at least as high as spec,*v* – which must be the case for it to serve as a domain adverbial.
- Ditransitive VP-copy necessitates a shelled VP-structure for the two objects, so that we have a VP comprising V, IO, DO in this order, which can be copied if need be. Following ideas from Soh's (1998: 177ff.) analysis of ditransitive/applicative constructions, simplified for our convenience, it is reasonable to posit something along the lines of (29):

(29)



Here APPL is incorporated into V, then V moves out to Asp, as usual, while the whole VP is copied up, again as usual, including the objects, which (as in the simple transitive case) do not get to move to spec,Asp, because it is the whole VP that makes this move, *en route* to the domain adverbial position, leading to structures like (16a).

---

33. In Bare Phrase Structure theory (Chomsky 1995 et sqq.) things get trickier since a 'VP' consisting of just an intransitive verb is non-distinct from just the verb head, so what is adjoined to X in (28) is really just a simplex, which moreover c-commands the 'head' copy in *v*. However, even in the bare theory, head chains and phrasal chains must be distinguished (e.g., they obey different locality constraints, and target different positions in the structure), so copies of the two chains involved will not 'mingle' at any level.

34. Here it is important that aspectual markers are particles (syntactic entities), rather than affixes, since the latter are part of the V-form merged into the structure on the standard (lexicalist) version of Minimalism. (Alternatively, a non-lexicalist version must be sought, such as Marantz's (2001) model.)

– The extraction pattern of (16b) may arise in one of two ways. In the first scenario, extraction occurs directly from the copied VP, to the topic position of the clause. If so, the CED must be relieved to allow this movement. The reason why such an option never obtains with monotransitives is probably none else than the haplology effect discussed above: if the object is extracted from the higher copy of VP, this leaves the two overt copies of V adjacent to each other, thus subject to contraction at PF (given that in that case chain reduction silences that copy of the object). In the other, more CED-friendly scenario, the movement of a [+meas] DO to spec,Asp may precede (and preclude) the movement of VP there.[35] VP moves more directly to its surface position (via a spec of *v*), while the object moves to topic position. This yields a case of forking chains for the object DP: one branch is formed with the link inside the raised VP, and another with the links in spec,Asp and the base position. The pronunciation of the object DP's topmost copy in the topic position induces the suppression of all other copies for both branches of the forked chain.

5.4 A partially similar construction

A reviewer has pointed out that there is yet another construction displaying the V-copy effect – the one illustrated in (30), with something like a partial object DP following the second copy:[36]

(30) a. *Wo* ***he*** *kafei* ***he****-le* *san* *bei.*
I drink coffee drink-PERF three cup
'I drank three cups of coffee.'

b. *Lisi* ***yang*** *gou* ***yang****-le* *san* *zhi.*
Lisi raise dog raise-PERF three CL
'Lisi raised three dogs.'

Superficially these sentences may look very much like the DUR/FREQ examples. There is, however, a crucial difference, as well: here the fronted NP can be considered to have been moved out of the numerically quantified DP, with a gap in the latter, because the given Num+Cl+N(P) sequence is a legitimate unit within the given sentence both syntactically and semantically: (31)

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35. One might speculate that in the shelled VP-structure the [+meas] feature cannot percolate to VP, so the VP cannot enter into Agree with Asp. Note that this derivation is only available to strong DPs ([+meas]), and it is precisely such DPs that may topicalize, i.e., the unavailablity of this derivation to [–meas] DPs won't block any possible case of topicalization.

36. Note, incidentally, that (unlike the core cases with DUR/FREQ or DEG complements), this type is not unanimously accepted by Mandarin speakers with V-copying.

(30′) a. *Wo* ***he*** *kafei*$_x$ ***he****-le* *san* *bei* ~~*kafei*~~$_x$.
I drink coffee drink-PERF three cup ~~coffee~~
'I drank three cups of coffee.'

(31) [$_{DP}$ *san* *bei* [$_{NP}$ *kafei*]]
three cup coffee
'three cups of coffee'

The same analysis, however appealing it might seem, won't apply to the DUR/FREQ complements, even if, for instance, the event classifiers in frequency complements are often seen as parallel to nominal classifiers (Sybesma 1999: 118ff). Here we assume with HLL (2009: 91ff) that DUR/FREQ expressions are V'-level adjuncts, as depicted in (26) above, to ensure their invariable syntactic placement, no matter whether they modify a V' with a definite DP-object, or a bare NP-object – the 'honorary' NP-modifier analysis of DUR/FREQ, as shown in (32), could only apply to the latter case.

(32) a. *kan* [$_{‘DP’}$ *san* *ci* [$_{NP}$ *dianying*]] *kan* [$_{‘DP’}$ *wu* *tian* [$_{NP}$ *shu*]]
watch three times movie read five day book
'watch movies three times' 'read books for five days'

b. **jian* [$_{‘??’}$ *san* *ci* [$_{DP}$ *ta*]] **kan* [$_{‘??’}$ *wu* *tian*
meet three times he read five day
[$_{DP}$ *zhe-ben* *shu*]]
this-CL book
'meet him three times' 'read this book for five days'

Thus the account for the DUR/FREQ-construction does not carry over plain and simple. Nevertheless, in view of the similarities, I believe that the main lines of that analysis should be followed for (30), too: the lowermost VP consists of V and the quantified object DP (as in (31)), dominated by an Asp- and a *v*-projection, with V-to-Asp and then [V+Asp]-to *v* obtaining. Then the whole VP containing the quantified DP object (as a clear instance of [+meas]) raises to spec,Asp (again, precluding object movement to that position), yielding something like (33):

(33) [$_{v}$P [$_{v}$ he] [$_{AspP}$ [$_{VP}$ [$_{V}$ he][$_{DP}$ san bei [$_{NP}$ kafei]]] [$_{Asp}$ he] [$_{VP}$ [$_{V}$ he] [$_{DP}$ san bei [$_{NP}$ kafei]]]]]

Finally, the VP is moved (=copied) up to the domain adverbial position (spec,X), just like it was in (28):

(34) [$_{XP}$ [$_{VP}$ [$_{V}$ he] [$_{DP}$ san bei [$_{NP}$ kafei]] X^0 … [$_{VP}$ [$_{V}$ he] [$_{AspP}$ [$_{VP}$ [$_{V}$ he] [$_{DP}$ san bei [$_{NP}$ kafei]]] [$_{Asp}$ he] [$_{VP}$ [$_{V}$ he] [$_{DP}$ san bei [$_{NP}$ kafei]]]]]

Next come the PF-operations, but here we must take into account yet another operation influencing chain reduction: information structure-based accenting and

deaccenting (Selkirk 1995; Schwarzschild 1999; Truckenbrodt 1999). Let us consider the copies of the two chains in this respect. The chain of V is not affected by information structural effects, hence chain reduction proceeds there in the default way: it silences all non-topmost copies. The chain of the VP, however, will receive certain prosodic markings affecting chain reduction. In particular, since the domain adverbial forming VP-movement is a case of backgrounding (cf. 5.1 above), this copy undergoes IS-based deaccenting as a whole, making focus-accenting impossible. On the other hand, the quantificational part of the object DP, *san bei* 'three cups', is focal information, and thus must be marked for accenting. Because of this IS conflict, prosodic F-marking must target a different copy of VP than the topmost one – assume that it is the next highest copy, the one in spec,Asp:

(34′) $[_{XP}\ [_{VP}\ [_{V}\ \text{he}]\ [_{DP}\ \text{san bei}\ [_{NP}\ \text{kafei}]]\ X^0 \ldots\ [_{vP}\ [_{v}\ \text{he}]\ [_{AspP}\ [_{VP}\ [_{V}\ \text{he}]$
$[_{DP}\ \boxed{\textbf{san bei}}_{F}\ [_{NP}\ \text{kafei}]]]\ [_{Asp}\ \sout{\text{he}}]\ [_{VP}\ [_{V}\ \sout{\text{he}}]\ [_{DP}\ \text{san bei}\ [_{NP}\ \text{kafei}]]]]]$

In this situation, chain reduction must follow a *scattered deletion* pattern (Ćavar & Fanselow 1997, *pace* Nunes 1999): *san bei* must be retained in the middle copy of VP,[37] resulting in the partial reduction of the other two VP-copies:

(34″) $[_{XP}\ [_{VP}\ [_{V}\ \text{he}]\ [_{DP}\ \sout{\text{san bei}}\ [_{NP}\ \text{kafei}]]\ X^0 \ldots\ [_{vP}\ [_{v}\ \text{he}]\ [_{AspP}\ [_{VP}\ [_{V}\ \text{he}]$
$[_{DP}\ \boxed{\textbf{san bei}}_{F}\ [_{NP}\ \text{kafei}]]]\ [_{Asp}\ \sout{\text{he}}]\ [_{VP}\ [_{V}\ \sout{\text{he}}]\ [_{DP}\ \sout{\text{san bei}}\ [_{NP}\ \text{kafei}]]]]]$

Finally, the non-F-marked portions of the low and middle VP-copies are deleted, too, yielding the PF-string '*he kafei he(-le) san bei*':

(34‴) $[_{XP}\ [_{VP}\ [_{V}\ \text{he}]\ [_{DP}\ \sout{\text{san bei}}\ [_{NP}\ \text{kafei}]]\ X^0 \ldots\ [_{vP}\ [_{v}\ \text{he}]\ [_{AspP}\ [_{VP}\ [_{V}\ \sout{\text{he}}]$
$[_{DP}\ \boxed{\textbf{san bei}}_{F}\ [_{NP}\ \sout{\text{kafei}}]]]\ [_{Asp}\ \sout{\text{he}}]\ [_{VP}\ [_{V}\ \sout{\text{he}}]\ [_{DP}\ \sout{\text{san bei}}\ [_{NP}\ \sout{\text{kafei}}]]]]]$

Thus the interplay of focus/background (de)accenting and chain reduction derive the correct PF-representation, while (as we have seen) in syntax the derivation of this pattern is identical to that of the DUR/FREQ-construction, *modulo* the placement of DUR/FREQ *vs.* numeral quantifier + classifier/massifier.

37. On the necessity of pronouncing prosodically marked chain-links see Landau's (2006: 56) notion of recoverability.

6. The Proposal – Part 2: DEGREE complements

The derivation of VCC with the DEGREE types of COMPL is markedly different from what we have just seen for the DURATION/FREQUENCY type.[38] That is, the similarity of verb copying is only apparent. In fact, in this type there is no movement of any 'V+object' unit anywhere. Instead, VCC emerges as copies of V surface at two distinct points in the structure, one before (the only copy of) the object nominal, and the other in V's base position, adjacent to the DEGREE COMPL introduced by the particle *-de*. In contrast with the DUR/FREQ-type VCCs, here there is no optionality in applying the copy construction with postverbal (i.e., non-fronted) objects, and nothing hinges on the referential properties of the object phrases. So the pattern for transitive predicates can be simply generalized this way: either the object is fronted (by topicalization, quantification induced fronting, or *BA*), or VCC is the only option to realize the sentence. A key factor in this situation is the nature of the particle *-de*: it is a PF-clitic which must cliticize to the right side of V, whereby (some overt copy of) V and the left edge of the DEGREE COMPL must be strictly adjacent.

The first question that must be clarified is the locus of the COMPL in the syntactic structure. Although this was a matter of debate for some time, the clear recent consensus is that it stands as the innermost complement of the verb (Tang 1990; Sybesma 1999 (at least for the 'result' subtype), Paul 2002a, Bartos 2010, HLL 2000: 86–91). This means that there will simply be no VP comprising just V and an object nominal in these derivations – with the DEGREE COMPL occupying the sister node of the lexical V, any object may only be merged in higher, in a next step.[39] In other respects, the derivation is basically the same as seen in the previous section: V raises via Asp to *v*, and the object DP does or doesn't raise to spec,Asp, depending on the value of its [meas]-feature. All these steps yield the representation in (35):

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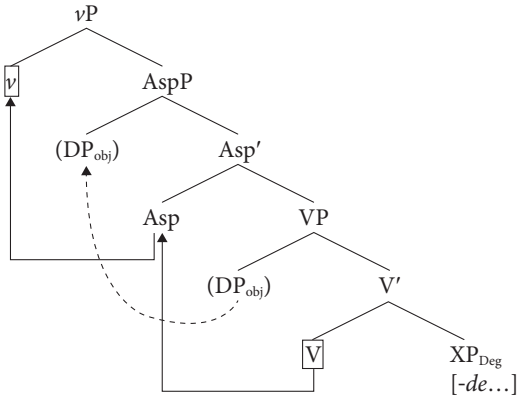
38. Many make a sharp distinction between two subtypes of DEGREE COMPLS: 'descriptive/manner' and 'result' (e.g., HLL 2000: 87ff.). However, despite the differences in their syntax, from the perspective of VCC they behave alike, and the hallmark *-de* particle, shown to play a crucial role in VCCs, is identical in the two. Furthermore, as HLL (pp. 86–87) argue, both occupy a structural complement position of V. Therefore, in this paper I consistently ignore the differences between the two subtypes, as irrelevant to the analyses pursued here.

39. This is obviously incompatible with the UTAH (Baker 1988), but HLL (p. 94, fn12) argue against the tenability of the UTAH in Mandarin Chinese, in general. In general, first and second merge to the predicate root do not differ w.r.t. the theta-relation they encode: if for any reason first merge of V is *not* with the internal argument, as in (29), second merge (to 'spec' of V) necessarily serves the purpose of saturating the lowest predicate chunk with the internal argument related to in its argument structure.

(35)



The inevitability of the VCC pattern follows from how chain reduction proceeds: apart from the possible object chain (which won't make a difference in the linearized structure), there is just one chain involved, the chain of V, with three links: in the base position, in Asp, and in *v*, respectively. The basic reduction rule, as introduced in 5.2, dictates that the topmost link, i.e., the one at *v*, be pronounced, and the others be silenced. However, this is partially overridden by PF-level considerations, in particular, by the clitic properties of *-de*: the PF-adjacency of some copy of V and *-de* must be ensured (clitic hosting), thus the lowest copy of V must be pronounced, too, resulting in a ***V Obj V deg*** surface linear order. (The two pronounced copies appear boxed in (35).)

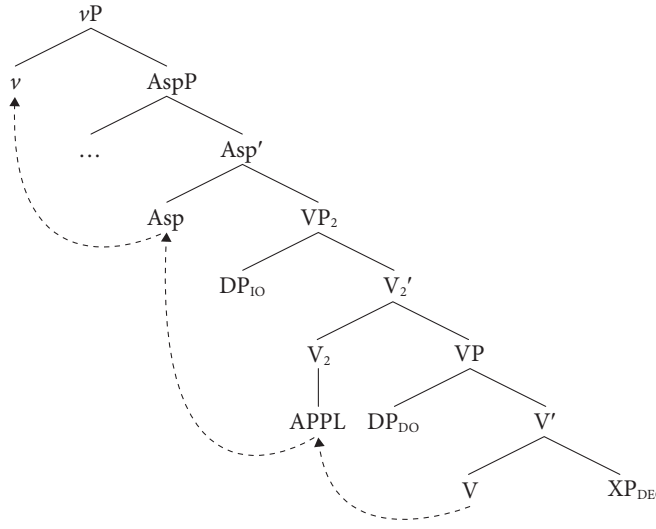
If for whatever reason the object phrase is further leftward-moved (topicalized, etc.), it is removed from between the two sounding copies of V, so there will be no need to pronounce the lowest V-copy any more, given that the particle *-de* will automatically be right-adjacent to the (by default) pronounced topmost V-copy, so the resulting ***Obj … V deg*** linear order opens up the way for *de*-cliticization to occur. In this case, then, the VCC pattern does not arise.[40]

The combination of DEGREE COMPL with a ditransitive predicate (shown to be possible by Fang & Sells 2007) presents a problem: on one hand, DEG must be the first-merged complement of V, while on the other hand, V must be combined with a shelled structure containing the applicative head establishing the necessary relation between the two objects. As we have just seen, the complementhood of DEG takes precedence,[41] so the VP-shell structure must be constructed in a different, non-canonical way. The simplest solution is an inverse combination of the V-root with APPL:

40. The same reasoning should apply to cases with intransitive verbs.

41. Bartos (2010) offers some speculations on why this should be so.

(36)



One of the objects, presumably only the closer one (here: IO), may possibly raise to spec,Asp, as before, making no difference in the PF-string. Otherwise the essential story is the same: two copies of the V-chain will be pronounced: the highest one in *v* (by the basic rule), and the lowest on in V, to satisfy clitic hosting for *-de*. Moreover, the DO can undergo A′-movement such as topicalization quite freely here, without CED-issues, leaving the rest of the VCC intact.[42]

6.1 Some remaining questions

There are a few questions concerning this proposal that (unlike what was the case with the account of the DUR/FREQ type) do not receive a straightforward answer, and need to be addressed separately.

6.1.1 *Why can't the 'V+Deg' unit be copied upwards just like 'V+Obj' in the dur/freq case?*

This question can be answered from a functional perspective. Given that the kind of domain adverbial formation we saw with the DUR/FREQ VCC is functionally an instance of *informational backgrounding* (cf. Gouguet 2005; Hsu 2008), and that the DEGREE COMPL is (part of) the focus of these sentences (Li 1990; Bartos 2010),

42. Both here, and in the DUR/FREQ-type, there is a question of why the IO cannot be extracted/fronted from the double object construction, but it is a more general question concerning Mandarin double object constructions (Li 1990: 69–76), not specific to VCCs, or the COMPL constructions. Fang & Sells (2007), who have drawn attention to the double object VCC data, have nothing to say about this issue, either.

it would lead to a functional contradiction, i.e., an interpretational failure at the level where information structure is resolved.

6.1.2 *How can the 'V+Obj' string be fronted, i.e., used as topic, etc.?*
In fact, it can't. Since the verb and its object form no exclusive constituent at any point in the derivation described above, one does not expect that to be possible. Nevertheless, there are examples that look like that has happened, such as (6c), repeated here simplified, as (37):

(37) ***Kai*** ***che*** *ta kai-de hen bang.*
drive car he drive-DE very good
'He drives cars very well.'

The only reasonable explanation is that whenever a 'V+Obj' string surfaces anywhere higher than *v* in the DEGREE type of VCC, it must be a base-generated domain adverbial (as in Tang 1990; Hsu 2008). Some support for this view comes from the absence of the V-identity effect:

(38) *Ta* [***yang*** *ma*] ***ba*** *ma* [***xunlian****-de hen shuncong].*
he raise horse BA horse train-DE very obedient
'(When) he raises horses, [he] trains the horses [to be] very obedient.'

The light verb *BA* is not lower in the structure than *v*, so the first 'V+object' sequence (*yang ma* 'raise horses') is definitely not part of the VCC-structure of the kind proposed in (35). It is indeed an independently generated domain adverbial, consisting of a verb and its object.[43]

6.1.3 *Why can't V bear any aspect-marking in this type of VCC?*
Unlike in the DUR/FREQ type, where the linearly second copy of V can be overtly aspect-marked by aspectual particles originating in Asp^0, in this type neither copy can be – even though (as proposed) V moves through Asp. In the case of the base-position copy, one may assume that (i) for hosting *-de* we need the bare stem form of V, and that (ii) in that position V hasn't picked up the particle yet, anyway, so the lower copy will never display Asp-marking. As for the higher, leftward copy, I speculate that the descriptive subtype of DEGREE COMPL only combines with aspectually neutral VPs, for semantic (or pragmatic?) reasons, so exponents of marked values for Asp do not cooccur with this kind of DEGREE COMPL at all. On the other hand, for the resultative subtype it does not appear to be true that V never

43. And possibly of an empty subject, as well, identified by the matrix subject.

bears aspect-markers in this VCC[44] – with even a cursory search, it is easy to find counterexamples on the web, such as (39):[45]

(39) *Wo kan-**le** na-ben shu **kan-de** yan zhuzi dou diao-chu-lai-le.*
I read-**PRF** that-CL book read-DE eye ball even fall-out-come-PRF
'I read that book so that my eyeballs nearly dropped out.'

7. The proposal – Part 3: Resultative compounds

The seemingly least complicated type of VCC is the one with a compound verb form containing a COMPL of result, as (1b), to be compared with its non-VCC counterpart, (10) (both repeated here):

(10) *Lisi* **kai**-*lei-le* *che.*
Lisi drive-tired-PRF car
'Lisi got tired (by) driving cars.'

cf. (1b) *Lisi* **kai** *che* **kai**-*lei-le.*
Lisi drive car drive-tired-PRF
'Lisi got tired (by) driving cars.'

However, on closer scrutiny, this one turns out to be the most problematic type, with data directly invalidating the application of either of the derivations offered above for the other two major types. For one, the structure illustrated in (10) is associable with both subject result and object result construals: (40a), but the VCC 'variant' only has the subject result reading, not the object result one (Cheng 2007: 167): (40b).

(40) a. *Lisi **qi**-lei-le na-pi ma.* – subject *or* object result
Lisi ride-tired-PRF that-CL horse
'Lisi rode that horse, and he/the horse got tired.'

b. *Lisi **qi** na-pi ma **qi**-lei-le.* – subject result only
Lisi ride that-CL horse ride-tired-PRF
'Lisi rode that horse and got tired.'

The structure usually proposed to underlie these sentences is like (41) – see Sybesma (1999), Cheng (2007), with the resultative VP/AP-head incorporating into the main V, and this verbal compound subsequently going way up to *v* via Asp:

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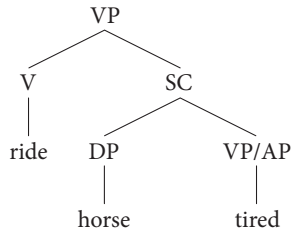
44. Whether this differential behavior has semantic/pragmatic reasons, or (as the reviewer has pointed out) is due to the variance of syntactic structures (descriptive DEGREE COMPLS are APs, while resultative ones are full clauses) is unclear to me as yet.

45. Found at http://book.kanunu.org/files/yqxs/201103/2207/67451.html, accessed on July 17, 2012.

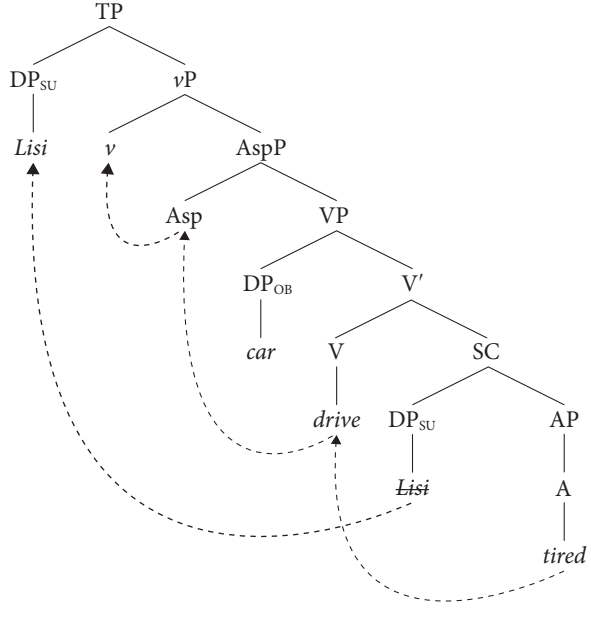
(41)



This easily derives (40a) with the object result reading, and provides a straightforward explanation for the lack of object result VCCs: since there is no motivation for pronouncing V in its base position (the resultative A/V is not cliticized but incorporated, note its position in the compound V between the V-root and the aspectual particle to be picked up at Asp), and there is no constituent comprising just V and its object (to the exclusion of the resultative head), VCC cannot arise in either of the ways sketched in the preceding sections.

But what about the subject result reading, and the two variants (1b) and (10)? The most basic question concerns the origin of linking the resultative predicate to the matrix subject. If we follow Cheng (2007) in generating the matrix subject inside SC, forming an ergativ(ized) VP, we must either merge in the object at spec,VP – then by incorporation and V-to-Asp-to-*v*, followed by the raising of the SC-subject to spec,TP, we can derive (10), as depicted in (42), but then the VCC (1b) is not derivable: there is no way to move 'V+object', and no way to get the lowest copy of V pronounced.

(42)



Alternatively, following Cheng's proposal throughout, we must resort to sideward movement: the ergativized VP leaves no space for projecting the object argument, hence V must be sideward moved out of the primary structure, then allowed to project this argument in an independent structure, which is then merged back into the main one at/above *v*-level, as was shown in (21a). But note that this way (10) cannot be derived, *pace* Cheng: if the thus obligatorily ergativized structure blocks the projection of the object argument (Cheng 2007: 169–170) then V must move sideward and project it, but once it does so, there is no way to avoid the VCC: the V inside the merged-back VP won't allow/trigger the reduction of its lower copy. Furthermore, an otherwise unwanted operation (sideward movement) is inevitably introduced into the system.

These considerations leave us with a single option: base generation of the 'V+object' unit of (40a) as a domain adverbial adjoined at the top of the predicate phrase, with the inherent problem of not being able to ensure the identity of the verbs of the VCC in any simple, direct way. Undesirable as it may seem at first blush, this account may turn out to be the only viable one, at least for the time being. A key reason to doubt the viability of alternatives is provided by the following type of examples (from Cheng 2007: 171), which look like a 'combination' of the VCC and the compound-with-postverbal-object structure (i.e., the types of (1b) and (10)), with two different arguments projected as the object of the matrix V and the subject of the resultative SC:

(43) a. *Ta kan* ***shu*** *kan-lei-le* ***yanjing.***
he read book read-tired-PRF eye
'He tired his eyes by reading books.'

b. *Ta ti* ***qiu*** *ti-po-le* ***qiu-xie.***
he kick ball kick-broken-PRF ball-shoe
'He broke his sports shoes by ball-kicking (= playing football).'

Cheng easily derives these by sideward movement and reprojection of the matrix V, but one cannot be sure if it is a virtue or a problem, considering further properties of this type of data. Firstly, there is more leeway in using different verbs in this subtype than in the types discussed so far, which actually points in the direction of the base-generation account:

(43′) a. ?*Ta* ***du*** *shu* ***kan****-lei-le* *yanjing.*
he read book read-tired-PRF eye
'He tired his eyes by reading books / studying.'

b. ?*Ta* ***wan*** *qiu* ***ti****-po-le* *qiu-xie.*
he play ball kick-broken-PRF ball-shoe
'He broke his sports shoes by ball-playing.'

Secondly, these examples hardly ever (if at all) occur with definite/quantified objects in the domain adverbial part – in fact, they are almost exclusively the 'V + cognate object' units, which are arguably lexical items (lexemes) in this complex form:

(44) a. ??T*a kan* ***na-ben*** ***shu*** *kan-lei-le* *yanjing.*
he read that-CL book read-tired-PRF eye
'He tired his eyes by reading books.'

b. ??*Ta ti* ***na-chang*** ***qiu*** *ti-po-le* ***qiu-xie.***
he kick that-VM ball kick-broken-PRF ball-shoe
'He broke his sports shoes (by) playing in that (foot)ball match.'

If such examples are truly ill-formed, and those in (43a′, 43b′) acceptable then Cheng's theory will have a hard time accounting for them, apart from likewise resorting to a base-generation analysis.

8. Conclusion

Concluding the findings of this paper, we can establish that the most tenable accounts of the VCC in the Chomskyan tradition, such as Gouguet's (2005), Cheng's (2007), Tieu's (2009) and mine (Bartos 2008, and the present one) have been on (slowly) converging paths, and are complex enough to handle the rather complex types of VCC:

– Syntactic effects are heavily interspersed with semantic/pragmatic and phonetic considerations.
– Both VP-level and V-level operations are involved (V-copy is not one construction, but a group of surface lookalikes, with different underlying structures).

Some recent contributions to the discussion of VCCs have presented certain challenges, have triggered some new insights, and brought up certain objections to our analyses (e.g. Fang & Sells 2007; Hsu 2008), but have been shown not to invalidate them. I hope to have demonstrated that some account couched in the terms of Minimalist syntax can be maintained for the wide spectrum of VCCs, be it Cheng's sideward movement based treatment, or Gouguet's VP-raising analysis, or my triple (V-movement, VP-movement, base generation) setup. But the re-opening of the case of VCC in the light of the new challenges has been temporary, and it can be put to rest.

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CHAPTER 8

The syntax of *either* and disjunction

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It is argued that the scope indicator *either* is base-generated in place and its syntactic relation with disjunction is subject to a phase-theoretic locality constraint. Apparently unbalanced disjunction where *either* does not occur adjacent to disjunction is in fact syntactically balanced coordination, with parts of the second disjunct possibly deleted by independent processes such as gapping or extraposition. Some facts recalling locality constraints on movement are shown to be due to conditions on deletion independently of movement. Processing may explain some but not all facts.

1. Introduction

Larson (1985: 220) notes that scope of disjunction associated with *either*, which he befittingly calls scope indicator (SI) (Larson 1985: 228), correlates with the position of *either*:

(1) a. Mary is looking for **either** a maid or a cook.
(narrow and wide scope de dicto, de re)
b. Mary is **either** looking for a maid or a cook.
(wide scope de dicto)
c. Mary **either** is looking for a maid or a cook.
(wide scope de dicto)
d. **Either** Mary is looking for a maid or a cook.
(wide scope de dicto)

The sentence in (1a) is three-way ambiguous, a point that Rooth and Partee (1982) observe in the sentence without *either*, but those in (1b–c) are unambiguous. It has narrow scope de dicto reading in which disjunction *or* is under the scope of the intensional predicate *look for*, understood to have the meaning in which Mary is looking for an individual that has either the property of being a maid or the property of being a cook, as informally represented in (2a):

https://doi.org/10.1075/lfab.15.08law

(2) a. Mary is looking for ((a maid) or (a cook))
(narrow scope de dicto)
b. $\exists x$, x is a maid or a cook, Mary is looking for x
(de re)
c. Mary is looking for a maid or Mary is looking for a cook.
(wide scope de dicto)

On this reading, Mary's search would be considered successful if the person she found is a maid or a cook.

It also has a de re reading in which disjunction is taken to have wide scope over the intensional predicate *look for*. On this reading, it is understood to have the meaning in which there is an individual *x* with the property of being a maid or that of being a cook, and Mary is looking for *x*. This reading is informally represented as in (2b). On this reading, Mary may though need not be ignorant of the career of the person she is looking for.

The sentence has yet another reading, which Rooth and Partee call the wide scope de dicto reading. On this reading, the disjunction *or* has sentential scope, having the meaning in (2c). This reading allows for the continuation '… but I don't know which'. That is, the speaker is unsure whether it is the case that Mary is looking for a maid or it is the case that she is looking for a cook. On this reading, Mary is looking for some individual with a particular profession. Notably the examples in (1b–c) only have the wide scope de dicto reading in (2c).

Larson's (1985) gives a syntactic movement account for the ambiguity of the sentences in (1) (also Munn 1993) according to which the SI *either* moves from its original position in (1a) to other positions in (1b–d). Despite its appeal, it is not entirely unproblematic when certain details of the analysis are examined more closely and other data are considered (Schwarz 1999).

In this paper, I concentrate on the syntax of the SI *either*. I propose that the SI *either* be base-generated in place, contra Larson (also Munn 1993), and disjunction is syntactically balanced coordination. The relation between the two is subject to a phase-theoretic constraint, to the effect that they cannot be separated by a phase boundary. Unbalanced disjunction is only apparent. In some cases, the SI *either* occurs adjacent to a disjunction, with parts of the second disjunct being deleted, much as suggested by Schwarz (1999). Significantly, the deletion is the same process observed elsewhere. In some other cases *either* occurs non-adjacent to disjunction, with no deletion of any sort, contra Schwarz (1999). I argue that a processing account for unbalanced disjunction is not sufficient to explain all the facts considered here.

2. Syntactic movement theory

2.1 Syntactic movement of the scope indicator either

Larson (1985: 228) suggests, following work by Lakoff and Peters (1969), Keyser and Postal (1976), Stockwell, Schachter and Partee (1977), Pesetsky (1982), that disjunction with the SI *either* be derived by base-generating the SI and disjunction *or* as one constituent. The SI may move in overt syntax or at the level of Logical Form (LF) via adjunction to INFL or S, AgrP or TP in current terms (Pollock 1989), where it marks scope of disjunction. The various positions of the SI can be thus schematically represented as in (3), where α is a variable ranging over categories and * is the Kleene star:[1]

(3) a. $[_S \ldots [_\alpha [_{CONJ}$ *either or* $] \alpha^\star] \ldots]$
b. $[_S \ldots [_{INFL}$ INFL *either*$_i$ $] [_{VP} \ldots [_\alpha [_{CONJ}$ e$_i$ *or* $] \alpha^\star] \ldots]]$
c. $[_S$ *either*$_i$ $[_S \ldots [_{VP} \ldots [_\alpha [_{CONJ}$ e$_i$ *or* $] \alpha^\star] \ldots]]]$

Along these lines, the examples in (1) would be derived as in (4). The SI *either* can stay in place as in (4b), or move to a position in a higher clause, as in (4c–d):

(4) a. Mary is looking for either a maid or a cook.
b. Mary is looking for $[_\alpha [_{CONJ}$ either or $]$ a maid a cook $]]$
c. $[_S$ Mary is $[_{INFL}$ INFL either$_i$ $] [_{VP}$ looking for $[_\alpha [_{CONJ}$ e$_i$ or $] \alpha^\star]$ a maid a cook $]]$
d. $[_S$ either$_i$ $[_S$ Mary is $[_{VP}$ looking for $[_\alpha [_{CONJ}$ e$_i$ or $] \alpha^\star]$ a maid a cook $]]]$

2.2 Disjunction and locality

The SI *either* is apparently subject to some locality constraint. It cannot be separated from disjunction by negation (Larson 1985: 224):

(5) a. Mary isn't looking for **either** a maid or a cook.
b. (?)Mary isn't **either** looking for a maid or a cook.
c. ??Mary **either** isn't looking for a maid or a cook.
d. ??**Either** Mary isn't looking for a maid or a cook.

This is reminiscent of syntactic movement of adjuncts.

The contrast in (5) is lacking in (6)–(7) where the embedded clause is a non-finite clause and no negation is present (Larson 1985: 219):

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1. Larson (1985) does not discuss various issues that arise in the structures in (3), e.g., how *or* comes to be in the position just before the last disjunct, how it is possible for *either* to adjoin to the head INFL, or to a clausal projection. I will also not pursue these issues here.

(6) a. John decided to **either** resign or retire.
b. John **either** decided to resign or retire.

(7) a. Sherlock pretended to be looking for **either** a burglar or a thief.
b. Sherlock pretended to **either** be looking for a burglar or a thief.
c. Sherlock **either** pretended to be looking for a burglar or a thief.

The derivations for these examples would be as in (8)–(9) where the SI *either* stays in place or moves to INFL of a higher clause (*e* is the empty category left behind by *either*):

(8) a. John decided [PRO to [**either** or [resign] [retire]]]
b. John **either**$_i$ decided [PRO to [e$_i$ or [resign] [retire]]]

(9) a. Sherlock pretended [PRO to be looking for [**either** or [a burglar] [a thief]]]
b. Sherlock pretended [PRO to **either**$_i$ be looking for [e$_i$ or [a burglar] [a thief]]]
c. Sherlock **either**$_i$ pretended [PRO to be looking for [e$_i$ or [a burglar] [a thief]]]

On this view, it is expected that the SI *either* is subject to **island constraints** on syntactic movement. The prediction is largely borne out by the facts (Larson 1985: 245).

As can be seen in (10)–(11), the SI *either* may not be separated from disjunction by a complex NP island or a *wh*-island:

(10) a. John maintains [$_{NP}$ the decision to **either** [resign or retire]]
b. *John **either**$_i$ maintains [$_{NP}$ the decision t_i [to resign or retire]]

(11) a. John knows when to [**either** [resign or retire]]
b. *John **either**$_i$ knows [$_{S'}$ when [PRO to [t_i [resign or retire]]]]

The ungrammaticality of the b-examples in (10) and (11) is readily accounted for in Larson's analysis, as the SI *either* moves out of a syntactic island in overt syntax.

In the Government and Binding framework (Chomsky 1981) at the time, movement was assumed to leave traces that are subject to the Empty Category Principle (ECP) (Larson 1985: 232):

(12) **The Empty Category Principle**
Traces, [e], must be properly governed.

Proper government is divided into two cases: (i) lexical government, i.e., government of α by some lexical category β which assigns α a thematic role, and (ii) antecedent government, defined as in (13):

(13) **Antecedent-government**
β antecedent-governs α if
i. β c-commands α
ii. β and α are co-indexed
iii. there is no γ (=NP, S′) such that β c-commands γ and γ dominates α, unless α is the head of γ

If the SI *either* is not an argument, then the traces it leaves behind when it moves out of a syntactic island would violate the ECP.

What is of special interest is that the distribution of the SI *either* is subject to a constraint that does not hold of movement in other cases. If disjunction is in a finite clause, then the SI *either* cannot be in a higher clause (Larson 1985: 222):

(14) a. John believes that Bill said that [Mary was **either** drinking or playing video games]
b. John believes that Bill said that [**either** Mary was drinking or playing video games]
c. ??John believes that Bill said **either** that [Mary was drinking or playing video games]
d. ??John believes that **either** Bill said that [Mary was drinking or playing video games]
e. *__Either__ John believes that Bill said that [Mary was drinking or playing video games]

According to Larson, the SI *either* differs from operators like *wh*-phrases in that it undergoes iterated adjunctive movement, not by substitution in COMP, which is the head of S′ under the assumption at the time. Traces in COMP can be antecedent-governed, subject to the condition in (13iii), while those in adjunct positions may not; therefore, a trace in adjunct position the SI leaves behind would not satisfy the ECP.

From the movement point of view, this is unexpected, however, for finiteness of a clause has little bearing on movement of non-arguments like adjuncts. These may be unproblematically extracted out of a finite clause (intermediate traces are left out for simplicity):

(15) a. Where$_i$ did John believe that Bill expected that Mary was drinking t_i?
b. How$_i$ did Sherlock pretend that he fixed the car t_i?

2.3 Some problems with movement theory

Larson's account evidently explains quite a few facts about disjunction scope and the position of the SI *either*. It nevertheless has several problems.[2]

First, there is no obvious reason for why the SI *either* should move. To the extent that movement of a phrase is restricted to positions where it can be independently generated (cf. Emonds 1976's Structure Preservation Hypothesis), then it must be that the SI *either* can be base-generated in its surface position. If so, there is no need for movement of *either* to its surface position, for it can be base-generated there in the first place.

Second, the ECP account does not explain why the finite vs non-finite distinction is relevant to movement of the SI. In order to allow for the SI *either* to move out of a non-finite clause (see (6) and (7)), the proviso is made in (13iii) that γ includes only tensed S's (Larson 1985: 233). For extraction out of infinitival clauses, then, the SI *either* is no different from *wh*-phrases. They can all move out of an infinitival clause:

(16) a. Where$_i$ did John believe Bill to expect Mary to be drinking t_i?
b. How$_i$ did Sherlock pretend to have fixed the car t_i?

However, the proviso that only tensed S's are relevant to antecedent-government is not independently motivated. As the finite vs non-finiteness distinction is irrelevant to movement in other cases (see (15)–(16)), it seems that the proviso is specifically for movement of the SI *either*. It is unclear why that should be so.

Third, not all non-finite clauses are the same with respect to the distribution of the SI *either*. Schwarz (1999: 345) points out that the SI can only marginally appear outside a *for*-infinitival containing disjunction:

(17) a. John wanted for you to eat **either** rice or beans.
b. ??John **either** wanted for you to eat rice or beans.

The contrast in (17) is not expected in Larson's account.

Munn (1993: 187) suggests that the syntax of the SI *either* be assimilated to that of quantifiers (May 1977, 1985):

(18) *Either* may move at S-structure by way of Quantifier Raising (QR).

As is well-known, QR is subject to finiteness and island constraints. A quantifier lying in a finite clause or a syntactic island may not have scope outside a finite clause or the island (cf. Wilder 1997):

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2. In spite of its reliance on notions that are no longer current, e.g., government, the essence of Larson's analysis would remain the same, as far as I can tell, regardless of how the ECP and antecedent-government are derived in current theory of syntax.

(19) a. Some girl maintained that she knew every 007 movie.
∃>∀; *∀>∃
b. Some girl revised her decision to watch every 007 movie.
∃>∀; *∀>∃
c. Some girl was wondering whether to watch every 007 movie.
∃>∀; *∀>∃

Likewise, a quantifier in a *for*-less infinitival may have scope over the matrix subject, but that in a *for*-infinitival may not (Schwarz 1999: 346):

(20) a. Some girl wanted to watch every 007 movie.
∃>∀; ∀>∃
b. Some girl wanted for you to watch every 007 movie.
∃>∀; *∀>∃

Lastly, a quantifier c-commanded by negation cannot scope over it (Schwarz 1999: 347):

(21) a. I do not know every poem.
b. The police didn't arrest many of the demonstrators.

The example in (21a) can only mean that it is not the case that I know every poem, i.e., I know some but there is at least one that I do not know. It cannot mean that I do not know any poem. The example in (21b) can only mean that it is not the case that the police arrested many of the demonstrators, i.e., they made some but not many arrests. It cannot mean that there are many of the demonstrators that the police didn't arrest, but they possibly arrested many others.

Given the similarity between the SI *either* and QR with respect to locality, there is good reason for relating the two, as suggested by Munn (1993).

Nevertheless, as Schwarz (1999) argues, the similarity is not complete; there are cases where the syntax of QR and that of the SI *either* diverge. When a phrase or a particle related to the predicate occurs after disjunction it is only marginally possible for the SI *either* to appear in clause-initial position (Schwarz 1999: 348):

(22) a. They found **either** this or that at the flea market.
b. He invited **either** you or me to the party.

(23) a. ?**Either** they found this or that at the flea market.
b. ?**Either** he invited you or me to the party.

(24) a. This pissed **either** Bill or Sue off.
b. They locked **either** you or me up.

(25) a. ??**Either** this pissed Bill or Sue off.
b. ??**Either** they locked you or me up.

Schwarz (1999: 349) calls the disjunctions in (22)–(25) **limping disjunctions**.

In syntactic movement theory according to which the SI *either* moves from a position adjacent to disjunction to its surface position, there is no reason for the degraded grammaticality of the examples in (23) and (25). If the SI can move to clause-initial position as in (26b) and (27b), then it should be possible for it to move to the same position in (28b) and (29b), given that the particle or phrase related to the predicate is not part of the disjunction (Schwarz 1999: 350):

(26) a. They found [**either** [this or that]]
b. **Either**$_i$ they found [t_i [this or that]]

(27) a. This pleased [**either** [Bill or Sue]]
b. **Either**$_i$ this pleased [t_i [Bill or Sue]]

(28) a. They found [**either** [this or that]] at the flea market.
b. ?**Either**$_i$ they found [t_i [this or that]] at the flea market.

(29) a. This pissed [**either** [Bill or Sue]] off.
b. ??**Either**$_i$ this pissed [t_i [Bill or Sue]] off.

Another problem that arises is that the examples in (30)–(31) are just fine, differing from those in (23) and (25) in that the second disjunct appears at the end of the sentence, what Schwarz (1999: 354) calls **split coordination**:

(30) a. **Either**$_i$ they found t_i this at the flea market, or that.
b. **Either**$_i$ he invited t_i you to the party, or me.

(31) a. **Either**$_i$ this pissed t_i Bill off, or Sue.
b. **Either**$_i$ they locked t_i you up, or me.

These examples differ from those in (28b) and (29b) in that the second disjunct is non-adjacent to the first disjunct.

The problem for the syntactic movement of the SI *either* is therefore two-fold. It does not explain why movement of *either* to clause-initial position results in degraded grammaticality in (28b) and (29b), but not in (26b) and (27b). Nor does it explain why the occurrence of the second disjunct in (30) and (31) at the end of the sentence should improve grammaticality.

In this light, Schwarz (1999: 349) suggests that the difference between the examples in (28b) and (29b) on the one hand and those in (30) and (31) on the other might be due to some 'finality restriction' (*distant* here means non-adjacent):

(32) *Either* may not be distant from its licensing disjunction if that disjunction is not final.

The restriction in (32) explains why (28b) is not as good as (28a), and similarly for (29b) and (29a), the SI *either* being distant from non-final disjunction. It also

accounts for why (29b) is worse than (26b) and (27b); in the latter case disjunction is final. However, as we will see, the 'finality restriction' is not without problems (see Section 3.2.1).

3. The reduction theory

In light of the various problems that arise in the syntactic movement account, Schwarz (1999: 351ff) suggests that disjunction with non-adjacent SI *either* is only apparently unbalanced. In fact, the SI *either* marks the left bracket of a balanced disjunction, and the appearance of unbalanced disjunction is due to deletion of the subject and the verb in the second disjunct. The problems in the syntactic movement account discussed above can indeed be solved. But as we will see, some other problems arise.

3.1 Apparently unbalanced disjunction as gapping

In the reduction theory, disjunction in (33a) and (34a) is derived as in (33b) and (34b) respectively, where the verb or the subject in the second disjunct is deleted:

(33) a. John **either** ate rice or beans.
b. John **either** [$_{VP}$ ate rice] or [$_{VP}$ ~~ate~~ beans]

(34) a. **Either** John ate rice or beans.
b. **Either** [$_{IP}$ John ate rice] or [$_{IP}$ ~~John ate~~ beans]

These examples are thus derived in the same way as those with gapping in conjunction, where the verb in the second conjunct is deleted:[3]

(35) a. Tom has a pistol and Dick ~~has~~ a sword.
b. Some ate beans and others ~~ate~~ rice.

On this view, disjunction in (33)–(35) is only apparently unbalanced, the remnants left behind by deletion in the second disjunct obscuring its underlying structure. Syntactically, it is balanced, the two disjuncts having the same size.

In the examples in (33)–(34), the second disjunct does not contain a subject. In fact, it is possible to have an overt subject in the second disjunct as well:

3. As Schwarz (1999: 352, note 17) points out, it is an independent issue as to whether gapping literally arises from deletion (see Hudson 1976; Sag 1976, among others) or the structure is interpreted by a semantic rule (see Williams 1977; Koster 1978 and Wasow 1979).

(36) a. **Either** [John has seen Harry] or [Bill ~~has seen~~ Sue]
b. **Either** [Sam plays the sousaphone] or [Jeckyll ~~plays~~ the heckelphone]

Disjunction in (36) is therefore very similar to conjunction with gapping in (37), lending some support to the idea that apparently unbalanced disjunction may be derived from balanced disjunction by gapping:

(37) a. [John has seen Harry] and [Bill ~~has seen~~ Sue]
b. [Sam plays the sousaphone] and [Jeckyll ~~plays~~ the heckelphone]

For limping disjunction, the derivation is quite straightforward. As shown in (38), all that is required is deletion of the subject and the verb in the second disjunct:

(38) a. ?**Either** [he found this] or [~~he found~~ that at the flea market]
b. ??**Either** [this pissed Bill] or [~~this pissed~~ Sue off]

The finality restriction in (32) is irrelevant here, since the SI *either* is adjacent to disjunction. According to Schwarz (1999: 356–357), the reason why the examples in (38) are degraded is that the second disjunct contains a dangling remnant, the PP *at the flea market* in in (38a) and the particle *off* in (38b). These do not have a correlate in the first disjunct (Schwarz 1999: 357).

The same is observed in gapping in coordinating conjunction:

(39) a. Some talked with you about politics and others ~~talked~~ with me about music.
b. *Some talked about politics and others ~~talked~~ with me about music.

(40) a. John dropped the coffee and Mary ~~dropped~~ the tea.
b. *John dropped the coffee and Mary clumsily ~~dropped~~ the tea.

More specifically, gapping requires that the remnants in the second conjunct, i.e., what is left over after gapping applies, have a correlate in the first conjunct. The correlate of a remnant is a phrase standing in the same structural relationship with the gap's antecedent. Thus, the example in (39b) is degraded, because the remnant *with me* does not have a correlate in the first conjunct, such as *with you*. Similarly, in (40b) the remnant *clumsily* does not have a correlate in the first conjunct, e.g., *intentionally*. The same can be said of the degraded grammaticality of the examples in (38). The remnants *at the flea market* in (38a) or *off* in (38b) in the second disjuncts do not have a correlate in the first disjuncts.

Split coordination of the sort seen in (30) and (31) is easily accounted for in the reduction theory, as in (41) where the subject and the verb in the second disjunct are deleted:

(41) a. **Either** [this pissed Bill off] or [~~this pissed~~ Sue]
b. **Either** [she turned the test in] or [~~she turned~~ the homework]

Schwarz (1999: 355) notes that example (41a) cannot be given an extraposition analysis in which *or Sue* in *Bill or Sue* is extraposed to the right of the particle *off* (similarly for (41b) where the second disjunct *or the homework* is extraposed around *in*). The examples in (42), from Johnson (1996), show that extraposition out of a coordinate object is impossible:

(42) a. I introduced Carrie and Will to each other.
b. *I introduced Carrie t_i to each other [and Will]$_i$
c. *I introduced Carrie to each other and ~~I introduced~~ Will ~~to each other~~.

Nor can example (42a) be derived by deletion as in (42c).

The similarity between disjunction and gapping in conjunction can be observed in several other cases. Gapping cannot apply to negation in the second disjunct (Schwarz 1999: 362–363), just as it cannot in the second conjunct (Neijt 1979: 66 and also Jackendoff 1971: 23 and Stillings 1975: 255):[4]

(43) a. ??John **either** didn't eat rice or ~~didn't eat~~ beans.
b. ??**Either** John didn't eat rice or ~~John didn't eat~~ beans.
c. ??**Either** John hasn't seen Harry or Bill ~~hasn't seen~~ Sue.

(44) a. *John didn't win the car, and Mary ~~didn't win~~ the free trip.
b. *I didn't eat fish, and Bill ~~didn't eat~~ rice.

Material across a non-finite control complement may be gapped, but that across a *for*-infinitival or a finite clause may not be (Schwarz 1999: 364):

(45) a. Some wants to write novels, and others ~~want to write~~ plays.
b. *[Vivek wanted for Nishi to buy the video] and
[Cary ~~wanted for Nishi to buy~~ the ice cream]
c. *[the first letter says that you should pay tax] and [the second letter ~~says that you should pay~~ V.A.T.]

In apparently unbalanced disjunction, too, the material across a *for*-less infinitival may be gapped, but that across a *for*-infinitival may not be. Nor is it possible to gap

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4. Schwarz (1999: 361) notes that in the example in (ia), from Siegel (1984), negation in the second conjunct is gapped, and the negated modal understood to have wide scope over the two conjuncts, as indicated in (ib):

(i) a. Ward can't eat caviar, and Sue ~~can't eat~~ beans.
b. It can't be that Ward eats caviar and Sue eats beans.
c. Ward$_i$ can't [t_i eat caviar] and [Sue eat beans]

He suggests the derivation in (ic) along the lines of Johnson (1996), about which I shall have no insight to offer. The similarity between the examples in (43) and those in (44) remains, although it is still unclear why gapping of negation is more degraded in disjunction than in conjunction.

materials across a finite clause. Schwarz does not give examples for these cases, but they are easy to construct:[5]

(46) a. **Either** [John wanted to eat rice] or [~~John wanted to eat~~ beans]
b. *__Either__ [Vivek wanted for Nishi to buy the video] or [~~Cary wanted for Nishi to buy~~ the ice cream]
c. *__Either__ [John believes that Bill said that Mary was drinking] or [~~John believes that Bill said that Mary~~ ~~was~~ playing video games]

The examples in (46b, c) can be excluded in the same way as those in (45b, c). Material across a *for*-infinitival or a finite clause cannot be gapped.

As Jackendoff (1971: 24) points out, the NP occurring after the control verb cannot be included in the gap:

(47) a. *[John wants Bob to wash himself] and [Mary ~~wants~~ ~~Bob~~ to wash himself]
b. *[I persuaded Mary to go to college] and [you ~~persuaded Mary~~ to go to work]

If the examples in (48) are derived from gapping, then they are expected to be grammatical on a par with those in (47):

(48) a. *__Either__ [John wants Bob to wash himself] or [Mary ~~wants Bob~~ to wash himself]
b. *__Either__ [I persuaded Mary to go to college] or [you ~~persuaded Mary~~ to go to work]

The expectation is borne out.

Discontinuous materials comprising a raising, a control verb and an infinitival complement in the second disjunct may be gapped, but the arguments in the first conjunct must have corresponding contrastive NPs in the second conjunct (Jackendoff 1971: 24):

(49) a. [Max seemed to be trying to force Ted to leave the room] and [Walt ~~seemed to be trying to force~~ Ira ~~to leave the room~~]
b. *[Max seemed to be trying to force Ted to leave the room] and [Walt ~~seemed to be trying to force Ted~~ to stay a little longer]

Disjunction with the SI *either* shows the same pattern:

5. The surface form in (46a) is from Schwarz (1999: 342). Given his analysis of other examples, it is likely to be derived by deleting the subject of the second disjunct and gapping of the matrix and the infinitival predicate. As we will see, deletion of the subject as indicated is problematic (see Section 3.2.6).

(50) a. **Either** [Max seemed to be trying to force Ted to leave the room] or [Walt ~~seemed to be trying to force~~ Ira ~~to leave the room~~]
b. *__Either__ [Max seemed to be trying to force Ted to leave the room] or [Walt ~~seemed to be trying to force~~ ~~Ted~~ to stay a little longer]

Apparently unbalanced disjunction and gapping are evidently very similar.

Moreover, the a-examples in (51) and (52) show that the SI *either* cannot be separated from disjunction by a syntactic island, as can be seen in the structures in the b-examples:

(51) a. *John **either** maintains the decision to resign or retire. (=(10b))
b. *John **either** [maintains [the claim to resign]] or [~~maintains [the claim to~~ retire]]

(52) a. *John **either** knows when to resign or retire. (=(11b))
b. *John **either** [knows [when to resign]] or [~~knows [when to~~ retire]]

Deletion across a syntactic island of the sort in (51) and (52) recalls impossible gapping across a syntactic island:

(53) a. *Some revised [their decision to cook rice on Monday] and others ~~revised their [decision to cook rice~~ on Tuesday]
b. *Some were wondering [whether to write to Bill] and others ~~were wondering [whether to write~~ to Mary]

It might be argued that examples (51a) and (52a) are not comparable to those in (53), for the second conjuncts in the latter have an overt subject, but the second disjuncts in the former do not.

But the examples in (54) with an overt subject in the second disjuncts are comparable to those in (53) and are ungrammatical as well:

(54) a. *__Either__ John revised his decision to cook rice on Monday or Bill on Tuesday.
b. *__Either__ John revised [his decision to cook rice on Monday] or Bill ~~revised [his decision to cook rice~~ on Tuesday]

(55) a. *__Either__ John was wondering whether to write to Bill or Sue to Mary.
b. *__Either__ John was wondering [whether to write to Bill] or Sue ~~was wondering [whether to write~~ to Mary]

The similarity between apparently unbalanced disjunction and gapping cannot be any clearer.

A major virtue of the reduction theory is that the derivation of apparently unbalanced disjunction is assimilated to the independent process of gapping. Given that disjunction is syntactically coordination just like conjunction to which gapping may apply, there is no reason why gapping cannot apply to disjunction. Unbalanced

disjunction is only superficially unbalanced. The two disjuncts are actually of the same size underlyingly. The reason why the second disjunct looks smaller than the first disjunct is because gapping has applied to it.

3.2 Some problems with the reduction theory

Despite many examples of disjunction can be subsumed under the gapping account, Schwarz's reduction theory of unbalanced disjunction is problematic in several respects. Specifically, it relies on a condition like the finality restriction that does not seem to be related to any general principle (3.2.1) or on impossible structures (3.2.2). It lacks an account for some instances of dangling remnant (3.2.3) or cases that are not derivable from gapping (3.2.4). It resorts to deletion of non-constituents (3.2.5) and does not distinguish structures that have different interpretations (3.2.6). Examples with missing subject in the second disjunct are in fact no evidence for the proposed left-bracket hypothesis according to which the SI *either* occurs at the left edge of a balanced disjunction (3.2.7). We take up these issues in turn.

3.2.1 *The finality restriction*

The finality restriction in (32) requiring that disjunction associated with a non-adjacent SI *either* be final is conceptually and empirically problematic. Conceptually, to the extent that it is not related to any general grammatical principle, the finality condition is no more than a restatement of the facts. In fact, as Schwarz (1999: 350) notes, it does not show reflexes in any domain other than the syntax of *either/or* itself. The problem remains even if it turns out to be a consequence of a general parallelism constraint on the coordinates of a gapping target that plausibly explains why dangling remnants are prohibited (Schwarz 1999: 356-357) (see the discussion of (38) and (39)). Importantly, some other cases are yet to be accounted for (see Sections 3.2.2 and 3.2.3).

Empirically, the condition in (32) is not precise enough to explain why the example in (57b) is fine, even though *either* is distant from non-final disjunction, just as it is in (56b):

(56) a. This pissed **either** Bill or Sue off. (=(24a))
b. ??**Either** this pissed Bill or Sue off. (=(25a))

(57) a. This irritated **either** Bill or Sue a lot.
b. **Either** this irritated Bill or Sue a lot.

The problem with the formulation in (32) is that it does not take into account the relation between what appears after disjunction and the predicate. The particle *off* after disjunction in (56) is lexically related to the predicate *piss*, i.e., the two form a semantic unit, but the adverb *a lot* in (57) is not.

3.2.2 *Impossible disjuncts*

In Schwarz's account, limping disjunction in examples like (58) would be derived as in (59):[6]

(58) a. ??**Either** this pissed Bill or Sue off. (=(30a))
b. ??**Either** she turned the test or the homework in.

(59) a. ??**Either** [this pissed Bill or ~~this pissed~~ Sue off]
b. ??**Either** [she turned the test or ~~she turned~~ the homework in]

But the derivation relies on structures that are independently impossible. As shown in (60), the particles *off* and *in* are obligatory (with *turn in* meaning 'submit') (cf. also Schwarz 1999: 357, note 23):

(60) a. This pissed Bill *(off).
b. She turned the test *(in).

In light of the facts in (60), it is difficult to justify the structures in (59), the first disjuncts not having the required particles. As a result, there is no reason to believe that examples in (58) are derived from the structures in (59).

3.2.3 *Correlates of the dangling particles*

If the remnants in the second disjunct are required to have a correlate, defined to be a phrase standing in the same structural relationship with the gap's antecedent, and the reason why the examples in (58) are grammatically degraded is because the second disjunct does not have a correlate, then it is not clear what is the correlate of the dangling remnant *off* or *in* in the second disjunct in the grammatical examples in (61) (Han and Romero 2002: 204):

(61) a. This **either** pissed Bill or Sue off.
b. She **either** turned the test or the homework in.

In the reduction theory, these examples would be derived as in (62) with balanced disjunction:

(62) a. This **either** [pissed Bill or ~~pissed~~ Sue off]
b. She **either** [turned the test or ~~turned~~ the homework in]

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6. A reviewer suggests that the degraded grammaticality of the examples be due to their being derived as in (i) where the first disjunct in fact has the particle related to the predicate deleted:

(i) a. ??Either [this pissed Bill ~~off~~ or ~~this pissed~~ Sue off]
b. ??Either [she turned the test ~~in~~ or ~~she turned~~ the homework in]

The degradation results from both backward and forward deletion. But as we will see, deletion of the particle in the first disjunct and the subject of the second disjunct is independently impossible (see Sections 3.2.3 and 3.2.5).

The particle *off* or *in* in the second disjunct apparently has no correlate in the first disjunct, just as in (58).[7] Clearly, the position of the SI *either* plays a crucial role, but it is not obvious how the reduction theory can bring it to bear on the difference between (59) and (62), for in both cases, the SI *either* is underlyingly adjacent to disjunction.

This problem arises in three other cases: **the secondary predication construction** of the sort in (63a) where the thematic verb *paint* forms some kind of complex predicate with the secondary predicate *red*, **discontinuous idiomatic predicates** as in (63b) where the verb *take* is not contiguous with the phrase *to task* it is related to, and **the causative construction** in (64):

(63) a. John painted the chair red.
b. They took the supervisor to task.

(64) a. John let the cat or the dog in.
b. John made Bill or Sue happy.

These too show the same contrast with respect to the position of the SI *either*. It may appear to the immediate left of the verb, but only marginally in clause-initial position:

(65) a. John **either** painted the chair or the table red.
b. ?**Either** John painted the chair or the table red.

(66) a. They **either** took the supervisor or the manager to task.
b. ??**Either** they took the supervisor or the manager to task.

(67) a. John **either** let the cat or the dog in.
b. ??**Either** John let the cat or the dog in.

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7. Noting the grammatical difference in (i) Schwarz (1999: 357, 360) remarks that it is harder to apply Right Node Raising (RNR, cf. Cann et al. 2005) to the coordinate structure when *either* appears before the subject (the bracketing is original):

(i) a. ?Either [they answered my question or ~~they answered~~ your questions correctly]
b. They either [answered my question or ~~answered~~ your questions correctly]

He does not compare pre-subject *either* in (58) with post-subject *either* in (61), however.

According to Han and Romero (2002: 204) the examples in (58) are worse than those in (61), because the particle *off* is raised out of two IPs in the former in contrast with raising it out of two VPs in the latter:

(ii) a. Either [$_{IP}$ this pissed Bill t_i or ~~this pissed~~ Sue t_i] off$_i$
b. This either [$_{VP}$ pissed Bill t_i or ~~pissed~~ Sue t_i] off$_i$

The particle *off* is moved to a higher position in (iia) than in (iib). The RNR analysis for (58) is nevertheless problematic insofar as deletion of the subject in the second disjunct is not independently justified (see Section 3.2.5 and the discussion of (103) below).

(68) a. John **either** made Bill or Sue happy.
b. ??**Either** John made Bill or Sue happy.

In the reduction theory, these examples may have the structures in (69)–(72) with balanced disjunction:

(69) a. John **either** [painted the chair or ~~painted~~ the table red]
b. ?**Either** [John painted the chair or ~~John painted~~ the table red]

(70) a. They **either** [took the supervisor or ~~took~~ the manager to task]
b. ??**Either** [they took the supervisor or ~~they took~~ the manager to task]

(71) a. John will **either** [let the cat or ~~let~~ the dog in]
b. ??**Either** [John will let the cat or ~~John will let~~ the dog in]

(72) a. John should **either** [make Bill or ~~make~~ Sue happy]
b. ??**Either** [John should make Bill or ~~John should make~~ Sue happy]

In all these cases, the SI *either* is adjacent to disjunction underlyingly, and the remnants are as dangling in the a-examples as in the b-examples. The grammatical contrasts between them thus call for an explanation.

3.2.4 *Disjunction with non-finite complements*

The reduction theory may explain many cases of apparently unbalanced disjunction in non-finite complement by gapping (see the discussion of (45)–(52)), while some other cases remain unaccounted for.

In the reduction theory, the example in (73a) would be derived as in (73b), with sentential disjunction:

(73) a. **Either** John wanted to clean the kitchen or to collect the garbage.
b. **Either** [John wanted to clean the kitchen or ~~John wanted~~ to collect the garbage]

But gapping with control complement may apply to both the matrix verb and the embedded infinitival verb, but not to the matrix verb alone:

(74) a. John wanted to clean the kitchen, and Mary ~~wanted to collect~~ the garbage.
b. *John wanted to clean the kitchen, and Mary ~~wanted~~ to collect the garbage.

As example (74b) is impossible, there is no reason to suppose that example (73a) is derived as in (73b) where the embedded infinitival verb is not gapped.

3.2.5 *Deletion of subject*

As Schwarz (1999: 353) notes, in standard cases of gapping the coordinator is *and* and the gap excludes the subject, and in the derivations of apparently unbalanced disjunction, according to the reduction theory, the coordinator is *either/or* and the gaps include the subject. We thus may wonder whether the difference between the two cases with respect to the subject justifies deriving apparently unbalanced disjunction from gapping with an additional step of deletion of the subject in the second disjunct. There is evidence that it does not.

In the examples considered so far, deletion of the subject in the second conjunct or disjunct makes no difference in the semantics. But there are cases where it makes a difference.

Winter (2000: 389) points out that predicate coordination predicating of a quantified subject is not always semantically equivalent to the two conjuncts separately predicating of the subject:

(75) a. NP sang and danced ~⇔ NP sang and NP danced NP=some girl, no girl, not every girl, Mary or Sue, at least/at most five girls, exactly five girls, most girls.
b. NP sang or danced ~⇔ NP sang or NP danced NP=every girl, no girl, not every girl, Mary and Sue, at least/at most five girls, exactly five girls, most girls.

(76) a. NP sang and danced ⇔ NP sang and NP danced NP=every girl, Mary, Mary and Sue.
b. NP sang or danced ⇔ NP sang or NP danced NP=some girl, Mary, Mary or Sue.

Thus, the pair of sentences in (77) and (78) are not semantically equivalent, for they have different truth-conditions:

(77) a. Some girl sang and danced.
b. Some girl sang and some girl danced.

(78) a. Every girl sang or danced.
b. Every girl sang or every girl danced.

Sentence (77a) is true in a situation in which the properties denoted by the two predicates are true of the same girl, and is false otherwise. Sentence (77b) is true as long as some girl sang and some girl danced, and there is no requirement that the two girls be the same. Similarly, sentence (78a) is true in a situation in which half the girls sang and half the girls danced, but sentence (78b) is false in that situation. If this is correct, then the examples in (77) and (78) cannot be related by deriving the a-examples from the b-examples by deleting the subject of the second coordinate.

Thus, the example in (79a) is not derived as in (79b), for it does not have the same meaning as that of the underlying structure without deletion:

(79) a. No girl came at two and left at three.
b. No girl came at two and ~~no girl~~ left at three.

In this light, there is no reason to suppose that the sentence in (80a) is derived from the structure in (80b) by deleting the subject in the second disjunct:

(80) a. **Either** no girl came at two or left at three.
b. **Either** no girl came at two or ~~no girl~~ left at three.

The former cannot be derived from the latter by deleting the subject in the second disjunct since it does not have the same meaning as the underlying sentence.

There seems to be no natural way to limit deletion of the subject in the second coordinate of a conjunction to the effect that only NPs of the sort in (76) may be deleted, but those in (75) may not. The same holds of disjunction.

As a result, cases of apparently unbalanced disjunction derived by deleting the subject in the second disjunct as in the reduction theory have to be given an alternative account. We will return to these in Section 4.1.

3.2.6 *Silent subject*

There are other instances of apparently unbalanced disjunction that cannot be derived from gapping, for the simple reason that the verb in the second disjunct is not gapped. Examples in (81) illustrate this point:

(81) a. **Either** he came or stayed at home.
b. **Either** John had resigned last month or will retire next month.

Schwarz (1999: 365-366) argues that cases like (81a), and by extension that in (81b) as well, though not derived by gapping, are nevertheless unproblematic for the reduction theory, for they are in fact balanced disjunctions with **a silent subject** in the second disjunct.

A special property of the examples in (81) is that if the subject in the first disjunct were an indefinite NP, such as in (82), then the silent subject in the second disjunct in (82a) cannot be understood as referring anaphorically to the indefinite subject in the first disjunct:

(82) a. #**Either** someone stole your hat or robbed a bank.
b. **Either** someone stole your hat or took it thinking it was his.

According to him, example (82b) plausibly provides alternative descriptions of a particular event in a way that example (82a) does not (cf. Kamp and Reyle 1993).

The silent subject in the second disjunct in (82) thus behaves much like the overt pronoun in (83):[8]

(83) a. #**Either** someone stole your hat or he robbed a bank.
b. **Either** someone stole your hat or he took it thinking it was his.

In the syntactic movement account of the SI *either*, the examples in (82) are derived from those in (84), which Schwarz (1999: 366) claims are both fully grammatical and interpretable without effort:

(84) a. Someone **either** stole your hat or robbed a bank.
b. Someone **either** stole your hat or took it thinking it was his.

He argues that the movement account by itself does not offer an explanation for why (82a) should differ grammatically from (84a) and concludes that the data on anaphoric reference in missing subject disjunctions lend support to the left bracket hypothesis, i.e., that in such cases, *either* marks the left edge of disjunction and the second disjunct has a silent subject and is of the same size as the first disjunct.

While Schwarz's argument based on the difference between (82) and (84) against the syntactic movement analysis is well-founded, it is far from clear that the conclusion is correct that the examples in (81) are balanced disjunctions with a silent subject in the second disjunct.

Schwarz is not explicit about the representation of the silent subject. If the examples in (82) were to be assimilated to those in (83), then they plausibly have the structures in (85) where the subject in the second disjunct is a null pronoun:

(85) a. #**Either** [someone stole your hat] or [*pro* robbed a bank]
b. **Either** [someone stole your hat] or [*pro* took it thinking it was his]

But null pronouns of the sort in (85) are not attested elsewhere. In fact, as Schwarz (1999: 367, note 30) points out, the silent subject has very restricted distribution. It must be adjacent to the coordinator of a conjunction, e.g., **yesterday he ate rice and today ate beans*. It is thus unclear whether the silent subject in (85) is in fact a null pronoun.

A point worth mentioning is that if the examples in (84) are fully grammatical, then the variants without the SI *either* should also be fine as well, for they would essentially have the same structure. This seems to be true for example (84b) and the variant without *either*. I leave it to the reader to judge how good the variant of example (84a) is without *either*, for it is exactly like example (82a) without *either*.

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8. Schwarz does not mark example (83a) with a #, but is explicit in the discussion that the indefinite noun phrase in the first coordinate and the pronoun in the second cannot be anaphorically related.

4. The locality condition for the SI *either*

In the foregoing sections, we saw that the structural relation between the SI *either* and disjunction is restricted in a way that recalls general grammatical principles.

In a range of cases disjunction seems to have a structure in which gapping has applied, most clearly when the second disjunct has an overt subject. This is hardly surprising; after all disjunction is syntactically coordination. As gapping may apply to a coordinate structure, there is no reason why gapping cannot apply to disjunction as well. Likewise, it is just as expected that some disjunction structures are excluded, for gapping in comparable structures of conjunction is also impossible (see (45)–(55) of Section 3.1).

However, there are cases that cannot be derived by gapping (see Sections 3.2.2 and 3.2.4). In this section, I present an alternative analysis for these cases in which disjunction is syntactically balanced. Differing from the reduction theory, however, I propose that the SI *either* be base-generated in its surface position, but not necessarily adjacent to disjunction. The structural relation between the two is subject to a phase-theoretic locality condition. Apparently unbalanced disjunction is derived from independently motivated structures and processes like gapping or extraposition.

Apparently unbalanced disjunction with an overt subject in the second disjunct essentially has the same structure as coordinate conjunction to which gapping can apply. No special assumption is required. The derivations for these cases will therefore not be repeated (see Section 3.1). Balanced disjunction without any deletion does not raise any particular problem, and so will not be considered, either.

In what follows, I concentrate on cases of disjunction that cannot be derived by gapping, i.e., cases in which the second disjunct does not have an overt subject. I begin by looking at an independent fact concerning deletion in verb phrase coordination. This turns out to have crucial bearing on the locality condition for the SI *either*.

4.1 Deletion in verb phrase coordination and dangling remnants

Examples of the sort in (86) raises the question of what structure should be assigned to them:

(86) a. John drinks coffee in the morning and tea in the afternoon.
b. John read this paper twice and that paper three times.

Superficially, it looks like an object and an adverb are being coordinated. The problem that arises is that if coordination is restricted to constituents (see Sag 1985 et al, however), and an object and an adverb do not form a constituent, then the

structures for the examples in (86) may be more complicated than what appears at first glance.

I assume with Hale and Keyser (1993), following Larson (1988), and much later work that the verb phrase is a projection of a light verb *v*. The structures for the examples in (86) with constituent coordination may be as in (87) with *v*P conjunction and deletion of the verb in the second conjunct (see also Hudson 1989:83):[9]

(87) a. John [$_{vP}$ drinks coffee in the morning and ~~drinks~~ tea in the afternoon]
b. John [$_{vP}$ read this paper twice and ~~read~~ that paper three times]

Deletion of the verb as in (87) affords an account for structures underivable from deletion of the subject in the second coordinate.

The examples in (88) with the control verb *want* and a non-finit complement apparently have non-constituent coordination:

(88) a. John wanted to drink coffee in the morning and tea in the afternoon.
b. John wanted to read this paper twice and that paper three times.

But they, too, can be given an account with constituent coordination in which the embedded complements are coordinated and the embedded infinitival verb in the second disjunct is deleted:

(89) a. John wanted [to drink coffee in the morning and ~~to drink~~ tea in the afternoon]
b. John wanted [to read this paper twice and ~~to read~~ that paper three times]

This account of apparent non-constituent coordination provides a means to derive structures that are not derivable from gapping.

Recall that the subject of the second conjunct cannot be deleted (Section 3.2.5). Given the possible structures in (87) and (89), the structure and derivation of coordination with a missing subject in the second conjunct as in (90a) would be as in (90b), with *v*P coordination and deletion of the verb of the second conjunct:

(90) a. No student went to the registrar at two and to the department at three.
b. No student went to the registrar at two and ~~went~~ to the department office at three.

Structures and derivations of this sort can be given to many cases of apparently unbalanced disjunction.

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9. It is possible that a projection larger than *v*P is coordinated in (87), e.g., some functional projection above *v*P but below the subject (see Pollock 1989; Belletti 1990). This point is not particularly crucial to the discussion of the facts considered here, however.

The examples in (91) with the SI *either* in apparently non-constituent coordination would have the structures in (92), with *v*P coordination and deletion of the verb in the second disjunct:

(91) a. John **either** drinks coffee in the morning or tea in the afternoon.
b. John **either** read this paper twice or that paper three times.

(92) a. John **either** [$_{vP}$ drinks coffee in the morning or ~~drinks~~ tea in the afternoon]
b. John **either** [$_{vP}$ read this paper twice or ~~read~~ that paper three times]

Examples with the control verb *want* and an infinitival complement can be given the same analysis as well:

(93) a. John wanted **either** [$_{vP}$ to drink coffee in the morning or ~~to drink~~ tea in the afternoon]
b. John wanted **either** [$_{vP}$ to read this paper twice or ~~to read~~ that paper three times]

Given that the finite verb of *v*P and the non-finite verb in the control complement can be independently deleted, the structures and derivations in (94) are plausible:

(94) a. John [wanted to drink coffee in the morning and ~~wanted to drink~~ tea in the afternoon]
b. John [wanted to read this paper twice and ~~wanted to read~~ that paper three times]

Apparently unbalanced disjunction of the sort in (95) can similarly be derived where both the matrix control verb and the embedded verb in the second disjunct are deleted:

(95) a. John **either** [wanted to drink coffee in the morning or ~~wanted to drink~~ tea in the afternoon]
b. John **either** [wanted to read this paper twice or ~~wanted to read~~ that paper three times]

As we will see (see Section 4.2), deletion in verb phrase coordination has some bearing on the account for some instances of apparently unbalanced disjunction.

Examples of apparently unbalanced disjunction with a missing subject in the second disjunct as in (96a), are derived as in (96b) with *v*P coordination and deletion of the verb of the second disjunct:

(96) a. No student **either** went to the registrar at two or to the department office at three.
b. No students **either** [went to the registrar at two or ~~went~~ to the department office at three]

Before leaving this section, we note that split coordination can be derived by deleting in the second conjunct the verb as well as some other materials:[10]

(97) a. John drinks coffee in the morning, and tea.
b. John read this paper twice, and that paper.

(98) a. John [$_{vP}$ drinks coffee in the morning, and ~~drinks~~ tea ~~in~~ ~~the morning~~]
b. John [$_{vP}$ read this paper twice and ~~read~~ that paper ~~twice~~]

We will see how the derivations in (98) can be replicated in split coordination in apparently unbalanced disjunction (see Section 4.3.1).

We now proceed to the analysis of the constraint on the structural relation between the SI *either* and disjunction.

4.2 Locality of the SI *either*

So far, it has not been made explicit where the SI *either* is located. I suggest that it be base-generated as adjunct to the syntactic projection of any category, and the category of coordination is the same as that of two coordinates, for the case at hand, it is the disjunction *or*:

(99) … [$_{ZP}$ *either* [$_{ZP}$ … [$_{YP}$ YP *or* YP]]]

The general schema in (99) is for all positions of the SI. If ZP coincides with YP, then the SI *either* forms a syntactic constituent with disjunction. This is the basic case of balanced disjunction. If ZP does not coincide with YP, then it is at a distance from disjunction, i.e., apparently unbalanced disjunction.

Consider now facts about apparently unbalanced disjunction. The example in (100a) with the SI *either* just before the verb can surely be given the structure in (100b) with NP coordination:

(100) a. John **either** ate rice or beans.
b. John **either** [$_{vP}$ ate [$_{NP}$ rice or beans]]
c. John **either** [$_{vP}$ ate rice or ~~ate~~ beans]

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10. All remnants in the second disjuncts in (98) have a correlate in the first disjuncts. The examples in (i) are excluded, since some remnants in the second disjuncts (*with me* and *clumsily*) do not have a correlate in the first disjunct (see Section 3.1):

(i) a. *Some talked ~~with me~~ about politics and others ~~talked~~ with me about music. (cf. (39b))
b. *John ~~clumsily~~ dropped the coffee and Mary clumsily ~~dropped~~ the tea. (cf. (40b))

But given the independent fact we consider above regarding deletion in verb phrase coordination, the structure in (100c) is in principle possible, with *v*P coordination and deletion of the verb in the second disjunct.

The example in (101a), too, can be given the structures in (101b,c), with NP coordination or *v*P coordination:

(101) a. **Either** John ate rice or beans.
b. **Either** John [$_{vP}$ ate [$_{NP}$ rice or beans]]
c. **Either** John [$_{vP}$ ate rice or ~~ate~~ beans]

There is reason to think that example (101a) only has the structure in (101c). We will see how the structure in (101b) is in principle excluded, and the consequence for apparently unbalanced disjunction.

Examples of apparently unbalanced disjunction with a missing subject in the second disjunct can now be derived in a simple way, by *v*P coordination and deletion of the verb in the second disjunct:

(102) a. **Either** no girl bought a book or a pencil.
b. **Either** no girl [bought a book or ~~bought~~ a pencil]

Consider now the examples in (103) and the question of why there should be a contrast between the two:

(103) a. This **either** pissed Bill or Sue off. (=(24a))
b. ??**Either** this pissed Bill or Sue off. (=(25a))

Example (103a) can in principle be given the structures in (104), one with NP coordination and the other with *v*P coordination:

(104) a. This [$_{vP}$ **either** [$_{vP}$ pissed [$_{NP}$ Bill or Sue] off]]]
b. *This **either** [$_{vP}$ pissed Bill or ~~pissed~~ Sue off]

The structure in (104a) is hardly surprising, for it is also possible with non-coordinate object. The structure in (104b) is excluded, for the first disjunct is independently impossible, the particle *off* being obligatory.

Example (103b) can in principle be given the structures in (105), one with NP coordination, one with *v*P coordination, and one with TP coordination.

(105) a. ??**Either** [$_{TP}$ this [$_{vP}$ pissed [$_{NP}$ Bill or Sue] off]]
b. ***Either** this [$_{vP}$ pissed Bill or ~~pissed~~ Sue off]
c. ***Either** [$_{TP}$ this pissed Bill or ~~this~~ ~~pissed~~ Sue off]

The structure in (105c) is impossible, for the subject of the second coordinate cannot be deleted (see Section 3.2.5). It is also excluded just as example (104b) is. The first coordinate is independently impossible, the obligatory particle *off* is missing.

The structure in (104a) differs from that in (105a) in exactly one respect. The SI *either* is adjoined to *v*P instead of to TP. If adjunction to a category results in a two-segment category (May 1985; Chomsky 1986), then in (104a) *v*P does not intervene between *either* and disjunction. By contrast, in (105a) where the SI *either* is adjoined to TP; hence, *v*P intervenes between it and disjunction.

I propose that the relation between the SI *either* and disjunction be subject to the phase-theoretic locality constraint in (106):[11]

(106) The locality condition for the SI *either*
??[$_{ZP}$ *either* [$_{ZP}$ … [$_{XP}$ … [$_{YP}$ YP *or* YP]]]] where XP, XP≠ZP, is a phase.

The locality condition in (106) does not rule out the structure in which disjunction itself is a phase, as long as it is not separated from the SI *either* by (another) phase. I assume that *v*P, NP (or DP) and CP are phases (Chomsky 2001).

The locality condition in (106) rules out the structure in (105a), for the phase *v*P intervenes between the SI *either* and disjunction. For the same reason, it also excludes the structure in (101b). There too the SI *either* is adjoined to TP and is separated from disjunction by *v*P. This is inconsequential, since the grammatical example in (101a) may be assigned the structure in (101c).

A point worth stressing is that we cannot avoid a violation of locality by deriving example (105a) from a structure with *v*P coordination and deletion of the obligatory particle in the first disjunct and the verb in the second disjunct, as in (107a):

(107) a. *__Either__ this [$_{vP}$ pissed Bill ~~off~~ or ~~pissed~~ Sue off] (=(25a))
b. *John [$_{vP}$ knows Bill ~~well~~ and Many ~~knows~~ Sue well]

Even though phase *v*P does not intervene between the SI *either* and disjunction, the structure is ruled out, for the same reason that deletion is not possible in the structure with gapping (* here is for the derivations, not the surface form). We have in fact encountered deletion of this sort (see Section 3.1). The remnants in the second coordinate need to have correlates in the first coordinate. In (107) the particle *off* and the adverb *well* in the second coordinates do not have a correlate in the first coordinates.

Other cases of dangling remnants pretty much fall under the account above. Consider the structures in (108)–(111):

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11. It is a little unclear how degraded examples excluded by the locality condition in (106) are. I follow the judgment reported in Schwarz (1999).

(108) a. She **either** [$_{vP}$ turned [the test or the homework] in] (=(61b))
b. ??**Either** she [$_{vP}$ turned [the test or the homework] in] (=(59b))

(109) a. They **either** [$_{vP}$ took [the supervisor or the manager] to task] (=(66a))
b. ??**Either** they [$_{vP}$ took [the supervisor or the manager] to task] (=(66b))

(110) a. John will **either** [$_{vP}$ let [the cat or the dog] in]
b. ??**Either** John will [$_{vP}$ let [the cat or the dog] in]

(111) a. John should **either** [$_{vP}$ make [Bill or Sue] happy]
b. ??**Either** John should [$_{vP}$ make [Bill or Sue] happy]

The contrasts above follow from the locality condition in (106). *v*P phase intervenes between the SI *either* and disjunction in the a-examples, but not in the b-examples.

However, we need to take into account structures that are derived from *v*P coordination and deletion of the verb in the second disjunct (see Section 4.1). This is to ensure that the examples in (108)–(111) do not have alternative structures that are incorrectly predicted to grammatical. Let us consider the structures in (112):[12]

(112) a. ??**Either** she [$_{vP}$ turned the test or ~~turned~~ the homework] in.
b. ??**Either** they [$_{vP}$ took the supervisor or ~~took~~ the manager] to task.
c. ??**Either** John will [$_{vP}$ let the cat or let the dog] in.
d. ??**Either** John should [$_{vP}$ make Bill or make Sue] happy.

In these structures, the SI *either* is not separated from disjunction by a phase. The locality condition in (106) is therefore not violated. However, they have an independently impossible disjunct in their structures, and hence are ruled out on syntactic grounds.

As well, the structures in (113) do not violate locality, there being no phase intervening between the SI *either* and disjunction:

(113) a. ?**Either** they [$_{vP}$ found this or ~~found~~ that] at the flea market. (=(23a))
b. ?**Either** John [$_{vP}$ painted the chair or ~~painted~~ the table] red. (=(65b))

They also do not have the problem of having an independently impossible disjunct. Notice that they are completely fine without the additional phrase at the end. The reason why with its presence they have less than perfect grammaticality is probably due to some uncertainty as to whether the phrase at the end is part of the second disjunct or related to the whole disjunction.

The structures in (114) have no impossible disjuncts and those in (115) have no issue with the association of the phrase in clause-final position:

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12. The phrase at the end of disjunction can be taken to be part of the second disjunct or part of the whole disjunction. In either case, the structures contain an independently impossible disjunct.

(114) a. *Either she [$_{vP}$ turned the test ~~in~~ or ~~turned~~ the homework in]
b. *Either they [$_{vP}$ took the supervisor ~~to task~~ or ~~took~~ the manager to task]
c. *Either John will [$_{vP}$ let the cat ~~in~~ or let the dog in]
d. *Either John should [$_{vP}$ make Bill ~~happy~~ or make Sue happy]

(115) a. *Either they [$_{vP}$ found this ~~at the flea market~~ or ~~found~~ that at the flea market]
b. *Either John [$_{vP}$ painted the chair ~~red~~ or ~~painted~~ the table red]

All of these also do not violate locality, there being no phase between the SI *either* and disjunction. They are nevertheless excluded in the same way as those in (107). A remnant in the second disjunct, *in*, *to task* and *happy*, does not have a correlate in the first disjunct (see 3.2.3) (* here is for the excluded structures, not the surface forms).

4.3 Explaining other facts

I now show how other facts can be accounted for by the locality condition in (106).

4.3.1 *Split coordination*

In light of the discussion of deletion in verb phrase coordination (see Section 4.1), data concerning split coordination in apparently unbalanced disjunction can be straightforwardly accounted for. The surface forms of these examples can be derived by *v*P coordination with deletion of the verb and other materials leaving behind a remnant that has a correlate in the first disjunct:

(116) a. **Either** they [$_{vP}$ found this at the flea market, or ~~found~~ that ~~at the flea market~~]
b. **Either** this [$_{vP}$ pissed Bill off or ~~pissed~~ Sue ~~off~~] (=(31a))
c. **Either** she [$_{vP}$ turned the test in or ~~turned~~ the homework ~~in~~]

Here, the SI *either* is not separated from disjunction by a phase. The derivations in (116a–c) are much like those in the reduction theory, except that here the second disjuncts do not have a deleted subject.

4.3.2 *Negation*

The examples in (43) with negation intervening between the SI *either* and disjunction violate the locality condition in (106), as can be seen in their structures in (117):

(117) a. ??John **either** [$_{NEGP}$ didn't [$_{vP}$ eat rice or ~~eat~~ beans]] (=(43a))
b. ??**Either** [$_{TP}$ John didn't [$_{vP}$ eat rice or ~~eat~~ beans]] (=(43b))

In both cases, the SI *either* is adjoined the NegP projection, and is separated from disjunction by *v*P.

4.3.3 *Embedded complements*

Disjunction in control complements can be readily derived. As shown in (118), these cases have structures that do not violate locality, for the SI *either* is not separated from disjunction by a phase:

(118) a. **Either** John [$_{vP}$ wanted to eat rice or ~~wanted to eat~~ beans] (=(46a))
b. **Either** John [$_{vP}$ wanted to clean the kitchen or ~~wanted~~ to collect the garbage] (cf. (73a))
c. **Either** Sherlock [$_{vP}$ pretended to be looking for a burglar or ~~pretended to be looking for~~ a thief] (cf. (7))

By contrast, apparently unbalanced disjunction with embedded *for*-infinitival and finite clauses is excluded, for it cannot be derived by any structure.

The structures and derivations in (119) do not violate locality, no phase intervening between the SI *either* and disjunction. But deletion of this sort is independently impossible (see (45)–(46)):

(119) a. *__Either__ Vivek wanted for Nishi to buy the video or the ice cream. (=(46b))
b. *__Either__ John believes that Bill said that Mary was drinking or playing video. (=(46c))

(120) a. *__Either__ [Vivek [$_{vP}$ wanted for Nishi to buy the video or ~~wanted for Nishi to buy~~ the ice cream]]
b. *__Either__ [John [$_{vP}$ believes that Bill said that Mary was drinking or ~~believes that Bill said that Mary was~~ playing video games]]

The alternative structures and derivations in (121) do not involve deletion, and hence do not have the problem in (120). But they violate locality:

(121) a. *__Either__ Vivek [$_{vP}$ wanted [$_{CP}$ for Nishi [$_{vP}$ to buy the video or the ice cream]]]
b. *__Either__ [John [$_{vP}$ believes [$_{CP}$ that Bill said [$_{CP}$ that Mary was [$_{vP}$ drinking or playing video games]]]]]

Here the SI *either* is separated from disjunction by *v*P phase and one or more CP phases.

The point is re-enforced by the contrast in (122), due exactly to the effect of the locality condition in (106):

(122) a. *Vivek **either** wanted for Nishi to buy the video or the ice cream.
b. Vivek wanted for Nishi **either** to buy the video or the ice cream.

The SI *either* is separated from disjunction by *v*P and CP phases in (122a), but not in (122b), as their structures in (123) show:

(123) a. *Vivek **either** [$_{vP}$ wanted [$_{CP}$ for Nishi [$_{vP}$ to buy the video or the ice cream]]]
b. Vivek wanted [$_{CP}$ for Nishi **either** [$_{vP}$ to buy the video or the ice cream]]

It seems that the locality condition in (106) has a cumulative effect. Grammaticality decreases in proportion to the number of phases intervening between the SI *either* and disjunction.

4.3.4 *Syntactic islands*

The effect of the locality condition in (106) also shows up in cases where the SI *either* and disjunction are separated by a syntactic island:

(124) a. *John **either** maintains the claim to resign or retire. (=(51a))
b. *John **either** knows when to resign or retire. (=(52a))

Their structures and derivations with deletion as in (125) do not violate locality; the SI *either* is not separated from disjunction by a phase:

(125) a. *John **either** [$_{vP}$ maintains the claim to resign or ~~maintains the claim~~ to retire]]
b. *John **either** [$_{vP}$ knows when to resign or ~~knows when~~ to retire]

They are nevertheless ruled out, for deletion of this sort is impossible (see (53)–(55)). The structures in (126) without deletion are also excluded, for they violate locality; the SI *either* is separated from disjunction by DP, CP or *v*P phase:

(126) a. *John **either** [maintains [$_{DP}$ the claim [$_{vP}$ to resign or retire]]]
b. *John **either** [knows [$_{CP}$ when [$_{vP}$ to resign or retire]]]

If the SI *either* occurs next to disjunction, then the examples are fine:

(127) a. John maintains the claim **either** [$_{vP}$ to resign or retire]
b. John knows when **either** [$_{vP}$ to resign or retire]

The contrast between (126) and (127) shows clearly the effect of the locality condition in (106).

The possible positions of the SI *either* in the conditional in (128a), too, are as expected. The antecedent clause of a conditional is a syntactic island; nothing may be extracted from it. The SI *either* can appear within the antecedent clause, but not to the left of the complementizer *if*, in its Spec or outside the clause:

(128) a. (***either**) if (**either**) Bill (**either**) praises (**either**) Mary or Sue, then John will be happy.

b. If [$_{TP}$ Bill [$_{vP}$ praises **either** [$_{NP}$ Mary or Sue]]], then John will be happy.
c. If Bill **either** [$_{vP}$ praises [$_{NP}$ Mary or Sue]], then John will be happy.
d. If **either** [$_{TP}$ Bill [$_{vP}$ praises [Mary or Sue]]], then John will be happy.
e. *[$_{CP}$ **either** if [$_{TP}$ Bill [$_{vP}$ praises [Mary or Sue]]]], then John will be happy.
f. ***Either** [$_{CP}$ if [$_{TP}$ Bill [$_{vP}$ praises [Mary or Sue]]]], then John will be happy.

In (128), *v*P or CP phase or both intervene between the SI *either* and disjunction in (128e, f) but not in (128a–d).

4.3.5 *Extraposition*

The examples in (129) may be given the structures in (130) where the SI *either* is adjacent to the *v*P conjunction:

(129) a. **Either** Willy put the flowers in a vase or on the table.
b. **Either** John send a student to New York or to Chicago.

(130) a. ***Either** Willy [$_{vP}$ put the flowers in a vase or ~~put the flowers~~ on the table]]
b. ***Either** John [$_{vP}$ send a student to New York or ~~send a student~~ to Chicago]]

But deletion of the verb and an internal argument of a three-place predicate, leaving the other internal argument behind, is problematic, for these two do not form a syntactic constituent.

The examples can be given the structures in (131) with no deletion. But these violate locality:

(131) a. **Either** Willy [$_{vP}$ put the flowers [$_{PP}$ in a vase or on the table]]
b. **Either** John [$_{vP}$ send a student [$_{PP}$ to New York or to Chicago]]

Here the SI *either* is separated from disjunction by *v*P phase, violating locality.

I suggest that in (129) the PP complement moves out of the *v*P adjoining to it, as in (132):

(132) a. **Either** Willy [$_{vP}$ [$_{vP}$ put the flowers t_i] [$_{PP}$ in a vase or on the table]$_i$]
b. **Either** John [$_{vP}$ [$_{vP}$ send a student t_i] [$_{PP}$ to New York or to Chicago]$_i$]

After adjunction *v*P is multi-segmented. It hence does not properly include the adjoined PP complement. As a result, *v*P does not intervene between the SI *either* and disjunction. The locality condition in (106) is therefore not violated.

Independent evidence for movement of the PP complement in (132) out of *v*P adjoining to it comes from the data in (133):

(133) a. Willy put the flowers t_i carefully [in a vase or on the table]$_i$, and Kim did too.
b. John sent a student t_i immediately [to New York]$_i$, and [$_{vP}$ send a student immediately to New York] he did.

In (133), the PP complement appears after a *v*P (or VP) adverb. Ellipsis in the second conjunct in (133a) and fronting of the *v*P in (133b) show that the PP is still part of *v*P.

If extraposition of this sort is possible, then we have to ensure that it would not incorrectly let in ungrammatical examples. We only need to consider cases where disjunction is at the end of the sentence, for the extraposed phrase is in that position.

Recall that negation cannot separate the SI *either* from disjunction (see Section 3.1.1). We may wonder if extraposition of disjunction would put it in a position resulting in the structure not violating locality. We consider examples with negation and syntactic islands, for they are subject to locality.

As shown in the structures and derivations in (134), adjoining disjunction to *v*P by extraposition as in (132) does not evade a violation of the locality condition in (106):

(134) a. ??John **either** [$_{T'}$ did [$_{NEGP}$ not [$_{vP}$ [$_{vP}$ eat t_i] [rice or beans]$_i$]
b. ??**Either** John [$_{T}$ did [$_{NEGP}$ not [$_{vP}$ [$_{vP}$ eat t_i] [rice or beans]$_i$]

The SI *either* is still separated from disjunction by the *v*P phase.

It is not possible to extrapose a phrase from an embedded clause to the matrix clause, given Ross's (1967) Right Roof Constraint:

(135) a. ?John wants [$_{vP}$ [$_{CP}$ for Nishi to buy the video] very much]
b. *John wants [$_{vP}$ [$_{vP}$ [$_{CP}$ for Nishi to buy t_i] very much] [the video]$_i$]

Thus, it is not possible to evade a violation of the locality condition in (106) by extraposing disjunction to the matrix clause:

(136) a. ***Either** Vivek wanted for Nishi to buy the video or the ice cream.
b. ***Either** Vivek [$_{vP}$ [$_{vP}$ wanted [$_{CP}$ for Nishi to [$_{vP}$ buy t_i]] [the video or the ice cream]$_i$]

(137) a. ***Either** John believes that Bill said that Mary was drinking or playing video games.
b. ***Either** John [$_{vP}$ [$_{vP}$ believes that Bill [$_{vP}$ said that Mary was t_i]] [$_{vP}$ drinking or playing video games]$_i$]

Clearly, extraposition does not incorrectly let in ungrammatical examples, a welcome result.

4.4 A processing perspective

In this section, we look at apparently unbalanced disjunction from a processing point of view. I argue that despite its plausibility in some cases, it is not sufficient to account for certain facts.

Given that the SI *either* may occur next to disjunction, we might think that a reason why some cases of apparently unbalanced disjunction are not very good is that the human parser expects a syntactically balanced disjunction upon hearing the SI *either*; specifically, it expects the second disjunct after *or* to be of the same size as the first disjunct after *either*. This is the spirit of the reduction theory according to which the SI *either* marks the left bracket of disjunction.

In apparently unbalanced disjunction, the second disjunct has less material than the first disjunct. When it encounters the second disjunct, the parser therefore has to recover the material that is missing by recalling what it hears in the first disjunct. The greater the difference between the two disjuncts, the more the parser has to recover for the missing materials. The processing load is thus proportionate to the amount of recovery.

The processing account conceivably explains the differences in (138). No recovery of missing materials is necessary in the a-example, disjunction being balanced:

(138) a. They found **either** [this or that] at the flea market. (=(28a))
b. They **either** [found this or <found> that] at the flea market.
c. ?**Either** [they found this or <they found> that] at the flea market. (=(28b))

Examples (138b,c) are apparently unbalanced disjunctions. One item, *found*, needs to be recovered in the second disjunct in (138b), and two, *they found*, in (138c) (the recovered items are in angled brackets). This may account for the grammatical difference between them.

The examples in (139) have the same contrast, and can be given the same explanation:[13]

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13. It is in principle possible that in (138)–(139) the phrase at the end of the clause is part of the second disjunct. In that case, they would be grammatically on the same footing as the examples in (i):

(i) a. Either they found this or we found that at the flea market.
b. Either John painted the chair or Bill painted the table red.

These are syntactically well-formed, the two disjuncts being independently possible. They nevertheless sound slightly off, for the same reason as that for (113), i.e., it is unclear whether the phrases *at the flea market* and *red* are associated with the second disjunct or to disjunction as a whole.

(139) a. John painted **either** [the chair or the table] red.
b. John **either** [painted the chair or <painted> the table] red. (=(69a))
c. ?**Either** [John painted the chair or <John painted> the table] red. (=(69b))

Example (139b) has one item to recover, *painted*, and example (139c) has two, *John painted* (but see also the discussion of (113b)).

The contrast in (140) follows straightforwardly from the processing account, there being more items to recover in the *for*-infinitive complement and the *for*-less infinitive complement:

(140) a. **Either** [John wanted to eat rice or <John wanted to eat> beans] (=(46a))
b. *__Either__ [John wanted for Mary to eat rice or <John wanted for Mary to eat> beans]

This seems to be a reasonable way to understand how processing of apparently unbalanced disjunction works.

Nevertheless, the processing analysis does not account for several cases of apparently unbalanced disjunction. It does not explain why no problem arises for examples in (141)–(142) where the number of items to be recovered varies from one to six:

(141) a. John **either** [ate rice or <ate> beans] (=(33a))
b. **Either** [John ate rice or <John ate> beans] (=(33b))

(142) a. Sherlock **either** [pretended to be looking for a burglar or <pretended to be looking for> a thief] (=(7c))
b. **Either** [Sherlock pretended to be looking for a burglar or <Sherlock pretended to be looking for> a thief] (=(118d))

We might argue that the examples in (138)–(139) differ from those in (141)–(142) in that they have an extra phrase after disjunction, increasing the processing load.

It may seem that the differences in (143)–(147) can be given the same explanation, although the contrasts here are sharper:

(143) a. This **either** [pissed Bill or <pissed> Sue] off. (=(61a))
b. ??**Either** [this pissed Bill or <this pissed> Sue] off. (=(25a))

(144) a. She **either** [turned the test or <turned> the homework] in. (=(62b))
b. ??**Either** [she turned the test or <she turned> the homework] in. (=(58b))

(145) a. They **either** [took the supervisor or <took> the manager] to task. (=(66a))
b. ??**Either** [they took the supervisor or <they took>the manager] to task. (=(66b))

(146) a. John will **either** [let the cat or <let> the dog] in. (cf. (67a))
b. ??**Either** [John will let the cat or <John will let> the dog] in. (cf. (67b))

(147) a. John should **either** [make Bill or <make> Sue] happy. (cf. (68a))
b. ??**Either** [John should make Bill or <John should make> Sue] happy. (cf. (68b))

But these structures are syntactically ill-formed, the first disjuncts being independently impossible (see Section 3.2.2). In fact, the b-examples in (143)–(147) remain degraded even if the materials in the angle brackets are overt, and no effort is needed to recover them. If the underlying structures are impossible, then we cannot rely on them to account for the contrasts.

Most problematic for the processing account are cases where the SI *either* and disjunction are separated by a syntactic island (see Section 4.3.4). To illustrate, consider the structures in (148) from the processing point of view:

(148) a. John maintains the claim **either** [to resign or to retire]
b. *John maintains **either** [the claim to resign or <the claim> to retire]
c. *John **either** [maintains the claim to resign or <maintains the claim> to retire] (=(10b))
d. ***Either** [John maintains the claim to resign or <John maintains the claim> to retire]

There appears to be no difference in grammaticality in (148b–d), even though the amount of material to be recovered in the second disjuncts varies. The same point can be made for apparently unbalanced disjunction in *wh*-islands:

(149) a. John knows when to **either** [resign or retire] (=(11a))
b. *John knows **either** [when to resign or <when to> retire]
c. *John **either** [knows when to resign or <knows when to> retire]
d. ***Either** [John knows when to resign or <John knows when to> retire]

Again, the number of items to be recovered makes no difference.

To claim that the ungrammaticality of (148b–d) and (149b–d) is due to processing misses the point that the independent process of gapping of the same materials is also impossible. The processing account is therefore not sufficiently general to explain all the facts concerning apparently unbalanced disjunction.

5. Conclusion

The facts concerning disjunction considered in this paper show that much of the properties associated with it are related to the syntax of coordination in general and the effects of independent processes like gapping, parallelism in deletion, and extraposition observed more generally elsewhere. Some of the effects resembling

movement properties are in fact derivable from these independent processes. There is thus no need to allow for an exception to antecedent-government, however this is derived in current theory, or constraints specific to disjunction like the finality condition.

The SI *either* is suggested to be base-generated in place in overt syntax and its structural relation with disjunction is subject to a phase-theoretic constraint to the effect that there can be no phase intervening between them. If this is correct, then the notion of phase is seen to be relevant to locality in another area of syntax. It also supports *v*P, NP (or DP) and CP being phases.

Nevertheless, we may ask why the SI *either* should be subject to such locality and whether it is related to any general grammatical principle. These conceptual issues are of special interest and require a detailed analysis. I can only offer here some hints at a plausible direction for future research. Recall Larson's (1985: 224) point that the SI *either* marks scope of disjunction. Disjunction adjacent to the SI may have scope in a higher position where *either* may in principle occur:

(150) a. Mary is looking for **either** [a maid or a cook]
(narrow and wide scope de dicto, de re)
b. Mary is **either** looking for [a maid or a cook]
(wide scope de dicto)
c. Mary **either** is looking for [a maid or a cook]
(wide scope de dicto)
d. **Either** Mary is looking for [a maid or a cook]
(wide scope de dicto) (=(1))

But disjunction may not have scope in a position narrower than the position of non-adjacent *either*. Disjunction in (150b–d) with non-adjacent SI *either* does not have narrow scope. Nor may it have wider scope (Larson 1985: 221):

(151) a. Sherlock pretended to **either** be looking for [a burglar or a thief]
b. Sherlock **either** pretended to be looking for [a burglar or a thief]

Disjunction may have scope outside the matrix verb *pretend* in (151b), but not in (151a).

These scope facts can be captured if disjunction moves in covert syntax to the position of the SI *either* and takes scope there. When the two are adjacent and form a syntactic constituent in overt syntax, then they move in covert syntax to a position where *either* can be independently generated. A consequence of this view is that disjunction may take scope in a higher clause in a non-finite clause (see (9)) but not in a finite clause (see (14)), for covert movement of logical operators like quantifiers and disjunction is restricted by the finiteness of the clause. Covert movement of the SI *either* and disjunction as a constituent is quite straightforward. Nevertheless,

exactly how disjunction moves covertly to non-adjacent *either* requires a more detailed and systematic investigation.

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CHAPTER 9

Focus, negation and event quantification in Chinese

How focus helps shape negation in natural language

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Chinese negators, *bu* and *mei*, translated as "not" in English, are assumed to be focus-sensitive indiscriminately. In this paper, I argue that unlike *bu, mei* does not lexically encode a dependency on the placement of focus, due to the failure of semantic focus to override its syntactic constraint. Syntax has made *mei* inherently a negative existential quantifier of situations. The role of focus in *mei*-sentences is to provide the backgrounded event description. Material within the TP scope of *mei*, excluding the focus, will be structurally mapped to the background part to set up its restrictive domain, and everything within its scope to the nuclear scope. Therefore, although falling under the same category, negators do not necessarily demonstrate the same focus dependency.

1. Introduction

1.1 The problem of *mei*

Bu and *mei*, both translated as "not" in English, are the two major negators in Chinese, and previous analyses assume them to be focus-sensitive indiscriminately, without distinguishing the two. While the assumption that *bu* is a focus-sensitive operator (cf. Xu and Li 1993; Lee and Pan 2001; Yuan 2000, 2005, etc.) will be adopted, the purpose of this paper is to examine the seeming focus-sensitivity of *mei* 'not', and *bu*-sentences will be included when comparison with its *mei*-counterparts is needed.

To state clearly the issue of the current study, the contrasts demonstrated by (1) and (2) make one question whether *mei* depends on focus in the same way as *bu*. Assume the following scenario for (1) and (2). Speaker A and Speaker B are newly admitted first-year undergraduate students and have in hand a list of items to be prepared before the semester begins. The list includes four items, namely a pocket dictionary, a calculator, a notebook and a pack of color pens. In the orientation

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program, they came across each other and Speaker A checked with Speaker B to see whether he has bought all the items on the list.

(1) Speaker A: *Zhe jiyang dongxi li, ni mei(-you) mai shenme?*
this several items among you not(-have) buy which
"For these several items (on the list), which item(s) you didn't buy?"

Speaker B: **[*Zidian*]f**, *wo mei(-you) mai.*[1]
dictionary I not-have buy
"I did not buy the dictionary."

a. Speaker B:
[*Zidian*]f, *wo mei(-you) mai*,
dictionary I not-have buy
(*erqie wo ye mei mai jisuanqi.*)
and I also not(-have) buy calculator
"(For the several items on the list,) I did not buy the dictionary, (and I did not buy the calculator as well)."

b. Speaker B:
[*Zidian*]f, *wo mei(-you) mai*,
dictionary I not-have buy
(*qishi wo yi jian dongxi dou mei mai.*)
in-fact I one CL item all not(-have) buy
"(For the several items on the list,) I did not buy the dictionary (, and in fact I did not buy anything on the list.)"

c. Speaker B:
[*Zidian*]f, *wo mei(-you) mai*,
dictionary I not-have buy
??(*wo genben mei(-you) qu mai*).
I indeed not(-have) go buy
??"I did not buy the dictionary(, as I didn't go shopping for that)."[2]

(2)[3] Speaker A: *Zhe jiyang dongxi li, ni bu mai shenme*?
this several items among you not buy which
"For the several items (on the list), which items you won't buy?"

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1. In this paper, focus refers to "contrastive focus", which is expressed through prosodic stress and represented as [ ]f throughout the paper.

2. Presupposition of the event exists in sentences like (1) when focus is put on the direct object. In the later part of the paper, I will show that such a presupposition will be absent when focus is placed on the negator *mei* itself and in the case of non-focused negation of *mei*.

3. The interpretation of the *mei*-sentences in (1) is confirmed and accepted by most native speakers. The interpretation of the *bu*-sentences in (2) is derived based on the assumption of *bu*

Speaker B: [***Zidian***]**f**, *wo bu mai*.
dictionary I not buy
"(For the several items on the list,) I won't buy the dictionary."

a. Speaker B:
[***Zidian***]**f**, *wo bu mai*, (??*erqie wo ye bu mai jisuanqi)*.
dictionary I not buy and I also not buy calculator
??"(For the several items on the list,) I will not buy is the dictionary. (I will not buy the calculator as well)."

b. Speaker B:
[***Zidian***]**f**, *wo bu mai*,
dictionary I not buy
??(*qishi wo yi jian dongxi dou bu mai*).
in-fact I one CL item all not buy
??"(For the several items on the list,) I will not buy the dictionary (, and in fact, I won't buy anything on the list.)"

c. Speaker B:
Wo bu mai [***zidian***]**f**, (??*wo genben bu qu mai*.)
I not buy dictionary I indeed not go buy
??"I will not buy the dictionary(, as I won't go shopping for that)."

(1a) and (2a) demonstrate the contrast between *bu* and *mei* in terms of exclusiveness of the focused NP. (1b) and (2b) show the difference between *bu* and *mei* with regard to the existential presupposition of at least one alternative to the focused NP. Finally, (1c) and (2c) demonstrate that both *bu* and *mei* presuppose the existence of the relevant event, though due to different underlying reasons. These contrasts reveal that the two negators cannot be depending on focus in the same way. This leads one to reconsider the assumption of previous analyses which take all negators as focus-sensitive, with focal mapping triggered indiscriminately.

1.2 Main ideas to be proposed in this paper

Previous analyses assume *bu* to be a focus-sensitive operator (cf. Lee and Pan 2001; Lin 2003; Yuan 2000; Hu 2008; Lee 2010, etc.), meaning that the interpretation of *bu* is dependent on the placement of focus, if there is one, with focal mapping triggered upon its direct association with focus. This paper re-examines the role of focus in *mei*, and argues that *mei* and *bu* are heterogeneous towards their focal behavior. *Mei* demonstrates different focal behavior from *bu*, as explicated below.

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as a focus-sensitive operator, and have been confirmed with native speakers who find the contrast between (1) and (2) noticeable to them.

First, *mei* does not lexically encode a dependency on the placement of focus. Focus is simply to provide a non-focused part to structure the event description in the background.

Second, the distinct focal behavior of *mei* is due to a syntactic constraint inherently imposed on *mei*, which requires it attach to its adjacent verb *you* 'have'. This would lead to a natural consequence of *mei* to be reanalyzed as a negative existential quantifier of situations, with its quantificational structure argued to be as follows:

> Quantificational structure of *mei* as a negative existential quantifier of situations
> Materials within the TP scope of *mei*, excluding the focus, will be structurally mapped to the background part, to set up its restrictive domain and everything within its scope to the nuclear scope.

Third, the above quantificational structure of *mei* would give its information-structural imports as follows:

i. the set of events in the restrictive domain gives the event description in the background part and the nuclear scope asserts that there exists no such an event denoted in the nuclear scope (cf. Herburger 2000);
ii. the restrictive domain of *mei* would trigger an existential presupposition of some (relevant) event, which is a member of a contextually salient set of events. Such presupposition can only be denied when focus is placed on the negator *mei* or when we have non-focused negation of *mei*;
iii. since focus is completely missing in the background part of *mei*, the existence of at least one alternative to the focus is not semantically presupposed in the background part; and
iv. since what triggers is not focal mapping, no exclusive reading would be found on the focus in *mei*-sentences.

Finally, the proposed analysis of *mei* would lead to the theoretical consequence that though falling under the same category, negators do not necessarily demonstrate the same focus dependency, and hence, they do not form a homogeneous class regarding their focus-sensitivity. This is evidenced in *mei* and *bu*, a point which is not well-recognized in previous analyses.

The remaining part of this paper is organized as follows: Section 2 gives an outline of Herburger's (2000) event quantification account. In Section 3, I argue that focus fails to override the syntactic constraint of *mei*, and direct association of *mei* with focus would lead to semantic deviation. Adopting an event-based account in Section 4, I reanalyze *mei* as a negative existential event quantifier, and demonstrate how quantification is performed in *mei*-sentences. Section 5 gives a brief contrast between *bu*/*mei(-you)* and *bushi* 'not-be', and the paper will be concluded in Section 6.

2. Sentences as descriptions of events

To reanalyze *mei* as a negative existential quantifier of situations, an event-based semantic approach is adopted in this paper. Under such an approach, sentences are first considered to be descriptions of events in Davidson (1967), termed as Davidsonian approach. Under the Davidsonian approach, events, in a generous sense that also include states, are considered to generate a spatio-temporal argument for the sentence. Along the same line, Parson (1990) decomposed verbs into "subatomic" semantics, which are translated as one-place predicates of events, regardless of whether they are syntactically unaccusative, intransitive, transitive or ditransitive, with the arguments of the verbs as forming their own conjuncts, and such an approach is termed as neo-Davidsonian approach.

Adopting the neo-Davidsonian approach along the line of Parson, studies have been conducted to examine how focus interacts with events and quantifiers/negation, which mainly include Bonomi and Casalegno (1993), Herburger (2000), Beaver and Clark's (henceforth B&C 2003, 2008). Among them, B&C (2003) revisited the interpretation of English "only" and "always". Despite the fact that both "always" and "only" can be considered as universal quantifiers which take a VP scope, B&C show that while "only" associates with focus, on a par with other A-quantifiers, it is not true for "always". Therefore, although "always" and "only" naturally fall into the same class of quantifiers, namely A-quantifiers, which are generally taken to be focus-sensitive (e.g. Partee 1995), they are distinct in their sensitivity towards focus.[4] If A-quantifiers demonstrate such heterogeneity, it is hypothesized that this is also true in the case of negation. Before verifying my hypothesis, one analysis which has to be mentioned is Herburger (2000)'s event quantification account, on which my analysis is based.

2.1 Herburger's (2000) event quantification analysis of focused quantifiers

Previous analyses like Jackendoff (1972), Rooth (1985, 1992), von Fintel (1994), among others, generally adopt a presuppositional analysis to explain focus interpretation, regardless of the specific approach taken. Herburger argues against such a presuppositional analysis of focus by pointing out the empirical problem and the theoretical concern such an analysis would be facing. First, empirically, the

4. It has already been noticed that A-quantification does not form a homogeneous class (cf. Partee 1995), and a similar claim is made in Evans (1995) who states that grammatically, A-quantifiers are a much more heterogeneous set than D-quantifiers, as evident in Australian languages, where A-quantifiers may take the form of invariant particles, coverbs, preverbs, enclitics to the verb, or verbal prefixes.

nature of focused quantifier will affect focal presupposition, and quantifiers form a heterogeneous class regarding their behavior toward semantic presupposition. Consider (3a) and (3b).

(3) a. **[Nobody]f** likes Bill.
b. **[Many of his colleagues]f** like Bill.

(3a) involves a decreasing quantifier "nobody" and (3b) a non-decreasing one "many of his colleagues". (3b) can be used in a context where it counts as previously established that Bill is liked, which would suggest that the non-focused part can give rise to the focal presupposition that somebody likes Bill. In contrast, this cannot be said of (3a). (3a) would be contradictory in this kind of context, since while the sentence presupposes that someone likes Bill, it then goes on to assert that it is nobody. Based on the contrast between (3a) and (3b), Herburger argues that the nature of the focused quantifier does determine whether the focal presupposition is present or absent. It is only when focus is on a non-decreasing quantifier that the existence of focal presupposition is without any problems, as in (3b), but not for the case of decreasing quantifier, as in (3a), where focal presupposition has to be absent. This is something that the presuppositional view fails to capture, and has to be added by stipulation.

On the other hand, the presuppositional view might counter-argue that a type-matching variable replacing "nobody" would be a variable over quantifiers (rather than a variable over individuals), and this makes existentially binding this variable generate a focal presupposition that some quantifier applies to Like(x, b). Since the quantifier in question might be decreasing (e.g. "nobody", "few", "if any, of his colleagues"), this seems to be without any problems, as it would not signal any commitment to the existence of someone who likes Bill. However, despite this, according to Herburger, a more general drawback of the presuppositional analysis of focus is that it relies on the notion of presupposition, and a number of non-trivial issues arise as soon as "presupposition" is taken in a more technical sense (Eckardt 1998). Furthermore, a more general problem which involves the classical "presupposition failure", as recognized in the Fregean view of presupposition, still remains unresolved.

Holding that both stative and eventive sentences are descriptions of events, Herburger moves on to propose an event quantification analysis to account for the behavior of the non-focused part of a sentence, which is an analysis that does not rely on the technical notion of presupposition and can differentiate (3a) and (3b). At the heart of Herburger's analysis lies the following claim.

(4) All the nonfocused material in the scope of the event quantifier Q also restricts Q.

(4) suggests that the event quantifier Q is restricted by the non-focused material, and hence, focus imposes a certain amount of structure on event quantification in the Davidsonian way as suggested in (4). The structured Davidsonian decomposition proposed will give the sentences below the translations shown as follows:

(5) a. **[Rosalia]**f write a poem.
b. [∃e: C(e) & Write(e) & Past(e) & [a x: Poem(x)] Theme(e, x)] Agent(e, Rosalia) & Write(e) & Past(e) & [a x: Poem(x)]

(6) a. **[Nobody]f** likes Bill.
b. [nobody x] [∃e: C(e) & Like(e) & Experiencer (e, x)] Theme(e, bill) & Like(e) & Theme(e, bill)

(7) a. **[Many of his colleagues]f** like Bill.
b. [many x: Of-his-colleagues(x)] [∃e: C(e) & Like(e) & Theme(e, bill)] Experiencer(e, x) & Like(e) & Theme(e, bill)

I am not intended to go into detail the technical concepts behind the representations given above. However, what needs to be pointed out is, representations given in (5b), (6b) and (7b) are based on the assumption that every sentence has a syntactically represented adverbial quantifier, be it overtly realized or tacit, with the latter being existential, except in generic sentences where they are (quasi)universal. The restriction of the quantifier Q as suggested in (4) serves the function of "setting the scene", which encodes what the rest of the sentence will be about. Such an aboutness is encoded by (8), cited from Herburger (2000).

(8) Quantifier Structure and Aboutness

For any utterance of a structure with a quantifier Q with restriction A and scope B, a relation R links A to what the utterance of [Q A]B is about. B, in turn, expresses the relevant assertion.

Herburger takes the relation R as a semantic-pragmatic relation that links the quantifier restrictions of a sentence to the pragmatic notion of what the utterance of the relevant part of the sentence is about. When defining aboutness and assertion, Herburger considers both as pragmatic notions, and a sentence can contain various instances of restricted quantification. The restrictions of event quantifiers can be quite large, and can even reach across clauses.

Based on the above, let us return to (5b). It is as a result of (8) and the structured Davidsonian decomposition suggested in (4) that (5) is about the event of writing a poem and gives rise to what Herburger call a "background focal entailment", which requires that such an event did indeed take place. However, still it has to be differentiated from the presuppositional analysis, as in case there was no event of poem writing, (5) would not have the value "valueless", as it would on the technical

version of the presuppositional view; instead a "false" value would be given under such a case. On the other hand, since the non-focused material "likes Bill" in (6) restricts the event quantifier, (6b) is pragmatically about whether or not Bill is liked.

Crucially, (6) does not entail that he is. Since the negative quantifier "nobody" takes scope over the event, the focally restricted event quantifier will not have existential import. This is made in contrast with (7b). Even though the focused quantifier takes scope over the event in (7b), since "many of his colleagues" is a non-decreasing quantifier, the narrow scope event quantifier will still have existential import.

Based on the above, claims made in Herburger's event quantification analysis that are relevant to our account of *mei* 'not' can be summarized in the following way. Event quantification is not always unrestricted. Rather, an event quantifier can be restricted by non-focused material in its scope. Being a quantificational restriction, the non-focused part marks what the relevant part of the sentence is about, and gives rise to a background focal entailment.

3. *Mei* and focus – an event-based account

On the basis of Huang (1988) and Ernst (1995), the focus-sensitive nature of the Chinese negator *bu* 'not' is well-argued in previous literature like Lű (1985), Xu and Li (1993), Lee and Pan (2001), Pan and Lee (2005), Xiong (2005), Yuan (2000, 2005), Chen (2007), Hu (2007, 2008), Lee (2010), among others. *Bu* is taken as a focus-sensitive operator in these studies, with its interpretation dependent on the placement of focus. The focus-sensitive nature of *bu* is captured by the following condition under Lee and Pan (2001).

(9) The Interpretation Condition (IC) of the Chinese negator *bu* 'not'
(cited from Lee and Pan 2001)

The negator *bu* 'not' associates with the focus if there is one to its right, and thus introduces a tripartite structure; otherwise it negates its adjacent phrase.

I do not intend to verify the IC here. Pan and Lee (2005) revise (9) in the following way, with the basic idea of IC maintained. When there is no focus, *bu* 'not' will simply negate the [–NP] phrase within its c-commanding domain, with no tripartite structure triggered. On the other hand, the focus-sensitive nature of *bu* leads to the following two consequences: (a) focus expands the negation domain of *bu* from its non-focused c-commanding domain to its local m-commanding domain, and (b) *bu* can associate with focused [+NP] constituents, which is otherwise impossible. *Bu* would then associate with the focus within its focus negation domain, with a tripartite structure triggered to determine its interpretation.

Since the focus-sensitivity of *bu* 'not' has been well-argued in previous studies, I simply follow previous analyses and assume *bu* to be a focus-sensitive operator, with interpretations of *bu*-sentences derived on the basis of such an assumption. The focus of this paper is on *mei*, with *bu*-sentences given for the sake of comparison.

3.1 The negation domain of *mei*

To begin with, let us examine the basic semantics of *mei* 'not' and its negation domain when there is no focus.

3.1.1 Mei *as a situation negator: Syntactic attachment of* mei *to* -you

Hsieh (1996, 2001) argues the difference between the two Chinese negators *mei* and *bu* to be as follows: *mei* cancels presuppositions, and thus marks sentential negation, while *bu* maintains presuppositions, and thus marks constituent negation (cf. Yeh 1995, etc.).[5] In fact, as early as Teng (1973a, b, 1974), *mei* is already considered to be taking a sentential scope. (10) below has the underlying structure as (11).

(10) *Ta mei you mai zidian.*
s/he not have buy dictionary
'S/he didn't buy a dictionary.'

(11) $[_S$ Ta$_i$ $[_{VP}$ mei $[_{VP}$ you $[_S$ t$_i$ mai (-le) zidian]]]]^6

(11) is adopted from Teng (1973a, b, 1974).[7] (11) shows that *-you* 'have', as a main verb, takes the sentence *Ta-mai-(le) -zidian* 'he-buy-(LE) -dictionary' as its object NP complement, with *mei* syntactically determined to negate *-you*. As to be shown in Section 3.3, such a syntactic property of *mei* in turn gives some kind of constraint to the semantic interpretation of *mei*. In line with Hsieh and Teng, the

5. Wang (2008) analyses *mei-you* 'not-have' as a discourse marker, and claims that when *mei-you* occurs within clauses, its semantic scope may be widened to the clause level (i.e. the level of metalinguistic negation), in line with Hsieh. Wang's analysis focuses more on the pragmatic perspective, and the scope of *mei-you* will be further widened to the discourse level, where they are used to create textuality and discourse coherence.

6. (11) is adapted from Teng (1973a, b, 1974), with the original representation as: $[_S$ mei $[_S$ Ta $[_{VP}$ you $[_{NP}$ $[_S$ Ta mai(le) zidian]]]]]. The two representations share the same view that *mei* takes a sentential scope, and *-you* is a main verb taking the sentence as its object NP complement.

7. Note that the underlying structure given in (11) naturally leads to the consequence that *-le* is deleted and is not considered as alternating with *-you*. This is in support of Wang (1965), which I do not intend to argue here whether or not *-you* and *-le* are allomorphs, and readers may refer to Wang (1965) and subsequent works for details.

sentential scope of *-you* also gains support in Huang (1990) and Hu (2008), with more detailed syntactic analyses given to *-you*.[8] Existential and perfective sentences are assumed to share the same deep structure syntactically under Huang's analysis, and the two differ only in whether subject raising takes place or not. Both existential and perfective *-you* are taken as a raising auxiliary, taking a clause as its complement. If subject raising takes place, it gives rise to existential sentences; otherwise perfective sentences. Their commonality is also revealed semantically – perfective sentences can be considered as a kind of existential sentences, with the former asserting the existence of a state or an event, and the latter asserting the existence of an individual or an object. Modifying Huang's analysis, Hu unifies two *you*'s as one assertive *you*, which is realized as a light verb asserting the existence of an event or state. Such an assertive *-you* is able to appear in two syntactic environments taking two different complements, namely VP and TP. According to Hu, when *you* takes VP as its complement, *-you* will be realized as an aspectual suffix *-le* attached to the lexical verb V, if there is movement from V to the position occupied by *you*. On the other hand, when *-you* selects TP as its complement, it nevertheless has to be realized as an overt lexical verb V *you*, in line with Teng's claim.

Generalizing the above, syntactically, if *-you* 'have' takes TP or a clause as its complement, following Teng, Huang and Hu, *mei* 'not' indirectly takes scope over a TP complement through negating *-you* 'not'. When *mei* negates *-you*, it itself can be assumed to be the head of NegP, on a par with *bu*, following Lin (2003) (cf. Xu 1999 as well), an issue which I will not further pursue here. Although Teng, Huang and Hu may differ in whether *-you* is taken as a lexical verb, a main verb or a raising auxiliary, in this paper, I will simply refer *-you* as a lexical verb, without further pursuing its syntactic category. What is important is, if *-you* takes a TP scope, the syntactic relation between *mei* and *-you* would assume *mei* to take the same scope as well. On the other hand, along such a line, if *-you* asserts the existence of an event or a state, I take the position that *mei* negates the existence of the situation (state or event), making it a situation negator semantically.[9]

In fact, the proposal of *mei* 'not' as a situation negator also gains support in recent studies on aspectual selection of the two negators. Lin (2003) is the first one

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8. Huang's analysis on *you* sheds important light on unifying possessive *you*, namely transitive *you* (a dyadic predicate), and perfective and existential *you*, namely intransitive *you* (a unary functor). Since possessive *you* is not the focus of my study, I will simply leave it here.

9. This in fact has already been stated in studies like Li and Thompson (1981) which argue that *mei* denies the completion of a situation (cf. Xiao and McEnery (2005) as well), and those by Liu X.N. (1988), Yuan (2005) and among others which consider that one use of *mei(you)* is to deny the action entirely or the occurrence of an action.

who has formally stated that *mei* aspectually selects an event as its complement, as opposed to *bu* 'not' which negates the state, which can be taken as taking *mei* as the negator of event. In line with Lin, Chen and Pan (2008) further argue that (i) *bu* selects individual-level statives or predicates which contain overt or covert modals or generic operators, giving the predicate a stative or generic reading, or adverbs of quantification; and (ii) *mei* is only compatible with stage-level predicates which include stage-level statives and eventives. The analysis proposed in this paper is along the line of Lin (2003) and Chen and Pan (2008). However, instead of restricting the study of *mei* to its aspectual selection, I will go further into analyzing *mei* as a negative existential quantifier of situations under the event-based semantics, and will examine the role of focus in *mei*-sentences, in contrast with *bu*-sentences, which has not been studied in Lin's account or other previous analyses.

3.1.2 *Focus does not affect the syntactic relation of* mei *with* you

Under the above scopal assumption of *mei* 'not', I will show that *mei* remains to be a negator of *-you* 'have', regardless of the position of focus in the sentence. Consider (12) below.

(12) *Ta* **[*zaijia*]f** *mei(-you) nuli dushu.*
s/he at-home not-have hard study
'It was at home that s/he did not study hard.'
But not "It was not at home s/he studied hard."

(12′) [$_{TP}$ Ta **[zaijia]f [$_{NegP}$ mei [$_{VP}$ [$_{V'}$ (you) [$_{TP}$ e [$_{VP}$ nuli dushu]]]]]]**

(12) has its focus placed on *zaijia* 'at-home', which is outside the scope of *mei* 'not', as shown in (12′), with the Isomorphic Principe (cf. Huang S. F. 1981) assumed. The interpretation indicated in (12) reveals that *mei* remains to be attaching to *-you* 'have', with its scope including *you-nuli-dushi* 'have-hard-study', and the introduction of focus fails to alter such a syntactic relation. Consider (13) below.

(13) *Lisi mei(-you) xiangdao ta hui xihuan* **[*Zhangsan*]f.**
Lisi not-have realize s/he will like Zhangsan
'Lisi has not realized that s/he will like ZHANGSAN.'
but not 'Lisi has not realized of anyone but Zhangsan that he will be liked by Lisi himself/herself.'

(13′) [$_{TP}$ Lisi [$_{NegP}$ **mei** [$_{VP}$ [$_{V'}$ **(you)** [$_{TP}$ **e** [$_{VP}$ **xiangdao** [$_{TP}$ **Ta hui xihuan [Zhangsan]f]]]]]]]

Having assumed that *mei* 'not' indirectly takes scope over a TP complement through negating *-you* 'have', the focus *Zhangsan* should be within its scope, as shown in (13′). Hence, if *mei* were able to associate with focus directly, the focus

Zhangsan would be within its domain for association. However, (13) reveals this is not consistent with the fact. If *mei* directly negates the focus, this would lead to the interpretation of "Lisi has not realized of anyone but *Zhangsan* that he will be liked by Lisi himself/herself", with an exclusive reading found on the focus *Zhangsan*, which is not the desired reading of (13). The reading of (13) is "Lisi has not realized that s/he will like ZHANGSAN". No exclusive reading is found on the focus *Zhangsan*, which shows that *mei* remains to negate *-you* instead of having direct association with focus. The focus is interpreted by some other focus-sensitive operator instead, the assertion operator for instance, giving it an affirmative or emphatic reading.

We can now conclude that regardless of whether focus appears within its scope, as in the embedded clause in (13), or outside its scope, as in the simplex sentence in (12), direct association of *mei* 'not' with focus is not observed and *mei* is always restricted to negating its adjacent verb *-you* 'have'. Therefore, a more fundamental question is whether focus plays any role in *mei*-sentences at all? This will be a question to be examined in the next section.

3.3 *Mei* does not directly associate with focus

If *mei* 'not' is a situation negator, which negates the existence of an event, I will model the semantics of *mei* under the neo-Davidsonian framework. The term "events" is taken in a broad sense, which includes states and events, a combined class which some authors refer to as eventualities (c.f. Bach 1986; Parsons 1990 etc.). Within the same framework,[10] B&C's analysis of "always" has provided us with a new perspective of viewing the role of focus in some operators which have been claimed to be focus-sensitive. Along such a line, although both *bu* 'not' and *mei* are negators, having assumed *bu* to be a focus-sensitive operator, I propose that direct focus association is not possible in *mei*. Focus in *mei*-sentences serves to provide a non-focused part, on which *mei* depends for the backgrounded event description, based on Herburger (2000).

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10. Along the same lines of Bonomi and Casalegno (1993) and Herburger (2000), B&C (2003, 2008) model focus-sensitivity in the neo-Davidsonian framework which makes essential use of a semantic type of "events". There are two main advantages to using events. First, events allow fine-grained distinctions to be made between the meanings of expressions that might be equivalent in a traditional Montagovian account which distinguishes propositions in terms of possible worlds. Second, as Davidson (1967) first showed, the use of an event argument can simplify the syntax-semantics interface, and this becomes even clearer when focus is involved.

To start off, let us first examine whether *mei* will directly associate with focus, on a par with *bu*. Consider (1) again, which is assumed to be uttered under the same scenario as mentioned in Section 1. Speaker A and Speaker B have in hand a list of things which they are supposed to buy before the semester begins. The list includes a closed set of four items, namely a pocket dictionary, a calculator, a notebook and a pack of pens.

(1) Speaker A: *Zhe jiyang dongxi li, ni mei(-you) mai shenme?*
this several items among you not(-have) buy which
"For these several items (on the list), which item(s) you didn't buy?"

Speaker B: **[*Zidian*]f**, *wo mei(-you) mai.*
dictionary I not-have buy
"I did not buy the dictionary."

a. Speaker B:
[*Zidian*]f, *wo mei(-you) mai*,
dictionary I not-have buy
(*erqie wo ye mei mai jisuanqi.*)
and I also not(-have) buy calculator
"(For the several items on the list,) I did not buy the dictionary, (and I did not buy the calculator as well)."

b. Speaker B:
[*Zidian*]f, *wo mei(-you) mai*,
dictionary I not-have buy
(*qishi wo yi jian dongxi dou mei mai.*)
in-fact I one CL item all not(-have) buy
"(For the several items on the list,) I did not buy the dictionary (, and in fact I did not buy anything on the list.)"

c. Speaker B:
[*Zidian*]f, *wo mei(-you) mai*,
dictionary I not-have buy
??(*wo genben mei(-you) qu mai*).
I indeed not(-have) go buy
??"I did not buy the dictionary(, as I didn't go shopping for that)."

For the convenience of discussion, (1) is adapted as (14) below, and (14a) gives the focus-background partition under the assumption of *mei* 'not' directly associating with focus.

(14) *Wo mei(-you) mai* [***zidian***]**f.**
I not-have buy dictionary
a. Direct association of *mei* with focus: Focus-background partition
Mei_f [∃e: Mai(e) & Subject(e, wo) & Object(e, f) & Past(e)] [f = dan shang de zidian)]
"For some (relevant) event of my buying x, the dictionary was the only x which I did not buy."
i. "(For the several items on the list,) I did not buy the dictionary(, and not the pen as well)."
ii. "(For the several items on the list,) I did not buy the dictionary(, and I bought nothing)."
iii. ??"I did not buy the dictionary (, as I didn't go shopping for that)."

(14a) would give (14) the reading of "For (some) relevant event of my buying x, the dictionary was the only x on the list which I did not buy", leading to the following predictions.

First, the focus-background partition would give an exclusive reading on the focus, making the dictionary to be the only item (and nothing else) on the shopping list that the speaker did not buy. Such an exclusive reading would predict (14ai) to be semantically odd, which is too strong and not consistent with the fact. (14) simply requires the dictionary on the list not bought, and whether other things on the list were bought or not would not affect the truth or falsity of the sentence.

Second, focus-background partition would leave behind a focus variable in the background part. Since *mei* 'not' were assumed to bind the focus variable in (14a), existential closure over the event variable would be assumed. These two together would result in the background part [∃e: Mai(e) & Subject(wo, e) & Object(f, e) & Past (e)]. This would semantically presuppose that something was bought in the shopping event, predicting the oddity of (14aii). Like (14ai), this is again too strong, as (14) in fact allows the reading of nothing was bought in the shopping event. Moreover, the same background part would presuppose the existence of at least one shopping event, hence a non-empty set of events. Since the negator *mei* scopes over both restrictor and nuclear clauses, it would not affect the existential closure confined in the background.

As will be shown later, although the oddity of (14aiii) is a welcoming conclusion and would correctly predict the reading of (14), the mechanism generating such a reading cannot be focus-background partition but the mapping triggered by the lexical semantics of *mei* 'not' instead.

At this point, the interpretation given in (14ai) and (14aii) has clearly shown that focus-background partition fails to correctly predict the reading of (14), which makes one question the assumption of taking *mei* 'not' to be focus-sensitive on a par with *bu* 'not'. This gains further support if one recalls the conclusion given in Section 3.2.2. It is found that *mei* fails to directly associate with focus within or outside its scope,

and is always restricted to negating its adjacent verb *you* 'have'. Hence, syntax has restricted *mei* to serve as a situation negator, with focus failing to override such a syntactic constraint. The *bu*-counterpart of (1) is repeated below for the sake of contrast.

(2) Speaker A: *Zhe jiyang dongxi li, ni bu mai shenme*?
this several items among you not buy which
"For the several items (on the list), which items you won't buy?"
Speaker B: **[*Zidian*]f**, *wo bu mai*.
dictionary I not buy
"(For the several items on the list,) I will not buy the dictionary."

a. Speaker B:
[*Zidian*]f, *wo bu mai,*
dictionary I not buy
??(*erqie wo ye bu mai jisuanqi*).
and I also not buy calculator
??"(For the several items on the list,) I will not buy the dictionary. (I will not buy the calculator as well)."

b. Speaker B:
[*Zidian*]f, *wo bu mai*,
dictionary I not buy
??(*qishi wo yi jian dongxi dou bu mai*).
in-fact I one CL item all not buy
??"(For the several items on the list,) I will not buy the dictionary (, and in fact, I won't buy anything on the list.)"

c. Speaker B:
Wo bu mai **[*zidian*]f**, (??*wo genben bu qu mai*.)
I not buy dictionary I indeed not go buy
??"I will not buy the dictionary(, as I won't go shopping for that)."

(2) is adapted as (15), assumed that what is triggered is focus-background partition.

(15) *Wo bu mai* **[zidian]f**.
I not buy dictionaries
"(For the several items on the list,) I won't buy the dictionary."
Bu_f [Wo mai f] [f = zidian]

a. "(For the several items on the list,) the only item that I will not buy is the dictionary, (and I will buy the remaining items.)"
b. ??"(For the several items on the list,) I will not buy the dictionary(, and the calculator either)."
c. ??"(For the several items on the list,) I will not buy the dictionary. (I won't go shopping for that.)"
d. ??"(For the several items on the list,) I will not buy the dictionary. (I won't buy anything on the list.)"

Assume the same scenario. The speaker and the hearer have in hand a list of things which they are supposed to buy before the semester begins. The list includes a closed set of 4 items, namely a pocket dictionary, a calculator, a notebook and a pack of pens. When there is a focus in the sentence, according to the IC proposed by Lee and Pan, *bu* 'not' will associate with the focus, triggering a focus-background partition in (15). Such a partition would give (15) the reading of (15a). An exclusive reading is found on the focused constituent *zidian* 'dictionary', as evidenced by the semantic oddity demonstrated in (15b). Moreover, since the non-focused part is mapped to the background part, this constitutes the focal presupposition *Wo-mai-f* 'I-buy-f' in the background. This leads to two existential presuppositions: some (relevant) shopping event performed by the speaker is presupposed; and there exists at least one alternative to the focus. Both presuppositions are non-defeasible, as evidenced by the oddity of (15c) and (15d).

Our claim that *mei* 'not' fails to directly associate with focus gains further support in (16) where focus is placed on an adjunct.

(16) *Wo mei(you) gen-[**XiaoZhang**]f qu kan dianying.*
I not(have) with-XiaoZhang go see movies
a. Direct association of *mei* with focus: Focus-background partition:
Mei_f [∃e: Kan-dianying(e) & Subject(e, wo) & With(e, f) & Past(e)] [f = XiaoZhang]
"For some (relevant) movie-seeing event which I went with somebody, XiaoZhang is the only one with whom I did not go."
i. "I did not go to see movies with XiaoZhang(, and not with Xiaoli as well)."
ii. "I did not go to see movies with XiaoZhang(, and I went to see movies alone)."
iii. ??"I did not go to see movies with XiaoZhang(, as I didn't go seeing movies)."

Assume that (16) is uttered under the following scenario. The speaker and the hearer share a list of individuals with whom the hearer assumes that the speaker would go seeing movies with.

If *mei* 'not' were assumed to associate with focus directly, a focus-background partition would be triggered, as in (16a). (16a) would again lead to the following predictions. First, the interpretation in (16a) has an exclusive reading on the focus part. This leads to the interpretation of *XiaoZhang* being the only one (and no one else) on the list with whom the speaker would not go seeing movies, which explains the oddity of (16ai). This is again too strong for (16) and is not consistent with the fact.

Second, under such a partition, the background part is the non-focused part [∃e: Kan-dianying(e) & Subject(e, wo) & With(e, f) & Past(e)], with the focused item replaced by a focus variable f and the same existential closure assumed as well. With *gen*-f 'with-f' included in the background part, this would semantically presuppose the speaker went seeing movies with someone, and the possibility of him/her having gone alone would be excluded, which accounts for the oddity of (16aii). This again is too strong for (16) and is not consistent with the fact. Moreover, the same background part would lead to the presupposition that the speaker has gone seeing movies, and the denial of the occurrence of the movie-seeing event would thus lead to the semantic oddity shown in (16aiii). Although this is a welcoming conclusion, like (14), it should not be contributed by focal mapping, but the mapping triggered by the lexical semantics of *mei* 'not' instead.

(16) demonstrates that focus-background partition fails to capture the interpretation of (16). (16a), together with (14a), clearly show that *mei* does not lexically encode a dependency on the placement of focus, or directly associates with focus.

4. Reanalyzing *mei* as a negative existential event quantifier

If *mei* 'not' does not directly associate with focus, does focus play any role in *mei*-sentences at all? In this section, adopting Herburger's event quantification account, I argue that the seeming focus-sensitivity of *mei* is resulted from its dependency on the background part, and the role of focus in the scope of *mei* is reduced to introduce the non-focused part to structure the background part of *mei* for quantification. In this view, *mei* at most can be considered to be indirectly affected by focus through the mediation of the non-focused part, if it is not insensitive to focus at all.

4.1 Dependency of *mei* on the non-focused part for backgrounded event description

To establish the semantics of *mei* 'not' as a quantifier, we need to recall the syntactic relation between *mei* and its adjacent verb *you* 'have'. Following Teng, Huang and Hu, *you* asserts the existence of a state or an event, which semantically can be assumed to be an existential quantifier of situations, ∃e, with e here taken in a broad sense which includes both states and events. If syntactically, *mei* is found to be constrained to its attachment to *you* and remains as a situation negator, no matter whether focus exists within or outside its scope (see Section 3), the syntactic relation between *mei* and *you* has already pre-determined *mei* to be a negative

existential quantifier of situations, semantically interpreted as ~∃e, which denies the existence of the event denoted by the predicate.

With the above assumption put into place, consider (14) again. When we discussed (14) in Section 3.3, I have shown that *mei* does not directly associate with focus, cf. (14a), the question at this point is does focus take any part in the quantificational structure of *mei*? (14a) has led to the conclusion of the following three properties of *mei*-negation: (a) there is no exclusive reading on the focus, (b) the occurrence of the shopping event is semantically presupposed; and (c) the existence of at least one alternative to the focused item is not semantically presupposed. To derive a semantic representation which can correctly capture these three properties, consider (14b).

(14) *Wo mei(you) mai **[zidian]f.***
I not-have buy dictionary
b. Default interpretation of (14):
λC~∃e [e∈C & Mai(e) & Subject(e, wo) & Past(e)] [Mai(e) & Subject(e, wo) & Object(e, zidian) & Past(e)]
Reading derived from (b):
"For some (relevant) buying event performed by me, there exists no such event of my having bought the dictionary on the list."
i. "(For the several items on the list,) I did not buy the dictionary, (and not the calculator as well)."
ii. "(For the several items on the list,) I did not buy the dictionary, (and I bought nothing on the list)."
iii. ??"I did not buy the dictionary, (as I didn't go shopping for that)."

Mei 'not' has been recaptured as a negative existential quantifier of situations, ~∃e, in (14b) and the representation given here can avoid the problems arisen in focus-background partition in (14a), due to the following reasons.

First, (14b) is not resulted from focal mapping. It gives (14) a reading of "for some (relevant) shopping event performed by the speaker, there exists no event of my buying of the dictionary on the list", with no exclusive reading imposed on the focused object NP *zidian* 'dictionary'. It allows that there are other things on the shopping list that the speaker also failed to buy, which accounts for the acceptability of (14bi) and is also what (14) intends to convey.

Second, since focus is missing from the background part in (14b), with no variable left behind, it would not semantically presuppose that something must have been bought in the event in question. This allows (14) to have a reading of "the speaker has performed the shopping event but did not guarantee that s/he had bought something", as supported by the acceptability of (14bii), which is also what is desired.

Third, (14b) requires the occurrence of some (relevant) shopping event performed by the speaker yesterday, as supported by the oddity of (14biii). Following Rooth (1996) and others, it is assumed in (14b) that the restrictive clause contains an implicit free variable *C*, with the reference of which to be fixed by context, and focus interpretation contributes a constraint on C. In the case of *mei* 'not', C constitutes a set of events salient in the context. The role of focus in *mei*-sentences is to contribute the non-focused part, which is how the restrictive domain of *mei* is set and C is further restricted. This can naturally be accounted for if one considers the quantificational rules given by Herburger in (4) and (8), which are manifested as follows.

Under Herburger's event quantification account, all the non-focused material in the scope of the event quantifier Q also restricts Q, cf. (4). Therefore, if *mei* is a negative existential quantifier, the non-focused part in its scope, namely [Mai(e) & Subject(Wo, e) & Past(e)], would naturally serve to restrict it. [Mai(e) & Subject(Wo, e) & Past(e)] denotes a set of shopping events performed by the speaker in the past, which provides an event description to help structure the background part (henceforth, referred to as "backgrounded event description"). "Event description" can formally be taken as the characteristic function of a set of events, i.e. a function from events to truth values.

For (14), the event description in the background part would require C to be in the form of *Mai(e, wo)*, denoting a larger set of shopping events performed by the speaker, with *e* being a member. Moreover, the oddity of (14biii) reveals that such a set is required to contain at least one member, namely *e*, which gains support under the current analysis of *mei*. Since the non-focused part contributes the restrictive domain of *mei*, the cardinality denoted by such a domain has to be greater than one, and the existence of at least one shopping event is thus expected. Such a conclusion can also be drawn from Geurts and van der Sandt (2004: 16) which state that since the background information generally gives rise to presuppositions, the presupposition of such a set to be non-empty naturally follows. All these thus explain why the denial of the occurrence of the shopping event in (14) would lead to the semantic oddity in (14biii).

Furthermore, according to (8) given by Herburger (2000), a relation R links restriction A to what the utterance of [QA]B is about, where B is the scope of the quantifier Q. Hence, in (14), R would link the restrictor part *Wo-mai* 'I-buy' to what (14) is about, and the nuclear part, which constitutes everything within the scope of *mei*, asserts that the event denoted by it is not a member of the set denoted by the restrictor part. However, unlike what is claimed in Herburger that the relation R that links the quantifier restrictions to the assertion part of the sentence is more pragmatic in nature, the case of *mei* represents a more structured partition: the non-focused part is structurally mapped to the restrictor, constraining the reference of the contextual variable C, and material within the scope of *mei* to the nuclear scope.

4.2 Does the existential presupposition of events always exist in *mei*-negation?

(14b) above correctly predicts the reading of (14), which is "for the (relevant) shopping event performed by the speaker, there exists no such event of my having bought the dictionary on the list". (14b) demonstrates a different role of focus in a negative sentence, and the mapping triggered is not focal mapping. If the role of focus is to provide the non-focused part for backgrounded event description, an immediate question is, can the existence of the event possibly be denied, in the case of *mei*-negation? In what follows, I will show that this is only possible in two cases: (1) the non-focused negation of *mei*, cf. (14c), and (2) when *mei* itself is in focus, cf. (17), and neither derives a reading on a par with that given in (14b).

(14) c. Non-focused reading:
~∃e [Mai(e) & Subject(e, wo) & Object(e, zidian) & Past(e)]
Reading derived from (c):
"There exists no event of my having bought the dictionary on the list."
i. "I did not buy the dictionary, as I didn't go shopping. "

Without focus, *mei* 'not', as a situation negator, would negate the existence of the event denoted by the VP *mai-zidian* "the buying of the dictionary (on the list)" and serve as a unary functor semantically, with no tripartite structure triggered, hence no background part. Since no backgrounded event description is invoked here, one would predict that denying the occurrence of the shopping event would not have any semantic problems. Such a prediction is borne out in (14c) which shows that even though we deny the occurrence of the shopping event, the reading resulted from it would not lead to any semantic oddity. However, this is definitely not the desired reading of (14), as (14) clearly presupposes the occurrence of the shopping event, and this becomes a crucial point distinguishing the non-focused reading in (14c) from the intended reading of (14) given in (14b).

That is to say, when there is no focus, *mei* 'not' serves as a unary operator negating *-you* 'have' and its complement TP; and although *mei* does not directly associate with the focus, if focus exists within the scope of *mei*, a restrictor part which serves as the backgrounded event description will be triggered, making *mei* a dyadic operator. This to a certain extent echoes what is claimed in Kratzer (1991: 646) that "every negation operator has a restrictive clause which results from the original clause by replacing the focused phrase with an appropriate variable". What is special, though, is that in the case of *mei*, the focused phrase is missing from the restrictive clause completely, instead of being replaced by a variable.

The denial of the occurrence of the event in cases like (14c) is referred to as "metalinguistic negation", following Hsieh (1996, 2001) and Horn (2001), which

is less strong and defeasible. When the speaker wants to deny the existence of the whole event, a more natural way is to have stress falling on *mei*(*-you*), which is case (2) mentioned above.

(17) *Wo* ***MEI(-YOU)*** *mai zidian.*
I not(-have) buy dictionary
"I DIDN'T buy the dictionary."

When focus falls on the negator, the negator is no longer a focus-sensitive operator, be it *mei* or *bu*. It would in turn be interpreting by some other focus-sensitive operator, assertion operator for instance, and the alternative set will contain two members, namely p and ~p. With ~p being asserted, this derives the reading of the denial of the event. It should be noted that unlike the non-focused case of (14c), the denial under (17) is something semantic, triggered by the semantic focus on the negator, which gives a polar contrast between the affirmative and negative propositions in question.

4.3 Existential presupposition of at least one alternative to the focus

Finally, one may argue that existential import of at least one alternative to focus should not be completely ruled out in the case of *mei* 'not' and on top of its default reading given in (14b), (14d) is yet a natural reading for (14).

(14) d. Possible interpretation of (14):
$\lambda C \sim \exists e\ [e \in C\ \&\ \exists x$: Mai(e) & Subject(e, wo) & Object(e, x) & Past(e)]
[Mai(e) & Subject(e, wo) & Object (e, zidian) & Past(e)]
Reading derived from (14d):
"For some (relevant) event of my buying x, there exists no such event of my having bought the dictionary on the list."
i. "(For the several items on the list,) I did not buy the dictionary(, and not the pen as well)."
ii. "(For the several items on the list,) I did not buy the dictionary(, and I bought nothing)."
iii. ??"I did not buy the dictionary(, as I didn't go shopping for that)."

In contrast with (14b), (14d) gives a reading of "I have bought something but not the dictionary", with an additional existential import in the background part, namely, the existential presupposition of at least one thing x (not the dictionary) bought by the speaker in the (relevant) shopping event. However, it should be noted that such an existential import is in fact inferential in nature.

To begin with, when comparing (14d) with the focus-background partition given in (14a), despite the fact that the same existential presupposition is invoked here, the existence of alternatives to f in (14a) and ∃x in (14d) are given by different restrictor parts. The focus variable f in the background part of (14a) is triggered by focal mapping, and f is semantically presupposed. Contrarily, if the restrictor part in (14d) remains to be the mapping triggered by the lexical semantics of *mei* 'not', the existential import regarding the individual variable x cannot be semantic in nature, but inferential instead. Such a claim is supported in the following way.

First, if the individual variable x in the backgrounded event description is semantically presupposed, the well-formedness of (14d) could not be explained. Hence, if (14dii) allows nothing to be bought in the (relevant) shopping event, the existential import in question can only be boiled down to an implicature or inference, and canceling it upon contextual accommodation would not lead to any semantic problems.

Second, the inferential nature of the existential import in (14d) also gains support from the "Background-Presupposition Rule (BPR)" proposed by Geurts and van der Sandt (1997, 2004). BPR states that "whenever focusing gives rise to a background λx.φ(x), there is a presupposition to the effect that λx.φ(x) holds of some individual" (2004: 1), but these presuppositions are inferences in nature and expected to be defeasible. I do not intend to pursue BPR any further, and the point here is that in the case of *mei*, since its tripartite structure is not triggered by focus-background partition, the presence of the individual variable x left behind by the focus simply serves to further restrict the backgrounded event description by selecting a smaller subset of events upon contextual accommodation or regulation by the variable C. This would mean that in the case of (14d), the domain of *mei* is further contextually restricted to include those shopping events which the speaker has bought something, instead of any shopping events performed by the speaker, as in (14b). Owing to its inferential nature, such an existential import is always defeasible, which accounts for the felicity of (14dii). This is unlike the presupposition of the occurrence of the (relevant) shopping event in (14diii), which, contributed by the backgrounded event description in the restrictor part of *mei*, is semantic in nature and non-defeasible. Except for the additional ∃x in (14d), other properties found in (14b) follow naturally in (14d), e.g. no exclusive reading is found in (14d), cf. (14di), and I would not repeat the details here.

In fact, the inferential nature of such an existential import is a natural consequence if one considers the way that the restrictor part of *mei* is structured – focus is removed from the background part altogether, with no variable left behind. Since the event description given in the background part of *mei* is determined by Davidsonian event decomposition, the verb is the core part in such a decomposition. If focus is placed on the verb, with the focused verb removed from the

backgrounded event description, what constitutes the background part of (14) is an event description in the form of [e∈C & Subject(e, wo)], namely the set of events or situations salient in the context which has the speaker as the subject. Potentially, all situations or events involving the speaker can be included in such a set, which constitutes a nearly unrestricted set. This definitely would not be a welcoming domain for quantification. Contrarily, if focus is placed on the event participant, its removal from the event description in the background part would simply lead to the consequence of the event description being a more general one, with the type of events still clearly indicated in the background part. The existential import of the focused item is therefore not difficult to understand.

A related issue here is, if the way the event description is structured in the background part of *mei* does not welcome the case of focus being placed on the verb, would it mean that the relevant *mei*-sentence would always be ill-formed under such a case? If not, how is it interpreted? To answer this question, consider the example below.

(18) *Ta mei(you) **[mai]f** na ben shu.*
s/he not(have) buy that CL book
a. Interpretation of (18)
ASSERT ~∃e [Buy(e) & Subject(ta, e) & Object(nabenshu, e) & Past(e)]
"He didn't BUY that book." Or "He did NOT buy that book."
i. "He didn't BUY that book. He did not buy anything in fact."
ii. "He didn't BUY that book. He did not go shopping in fact."
b. Non-focused reading:
~∃e [Mai(e) & Subject(ta, e) & Object(nabenshu, e) & Past(e)]
"He did not buy that book."

(18) has focus placed on the verb *mai* 'buy'. The reading given in (18) suggests that what is triggered is a reading on a par with having focus placed on the negator itself, as in (17). As stated in Geurts and van der Sandt (2004: 37), common ways of signaling polarity focus are accentuation of the positive or negative nexus of the sentence, such as the finite verb, the main negation or an affirmative focus particle. The effect of focus in (18) is to induce the trivial presupposition that he either did buy that book or did not, and semantically, we can consider such a trivial presupposition to be boiled down to inducing no presupposition whatsoever, which accounts for the felicity of (18ai) and (18aii). Under such a case, the difference between (18) and the non-focused reading in (18b) will simply be that (18a) carries an additional assertive meaning induced by the focused verb. I will not go into detail how polarity negation is performed in Chinese negation. Examples like (18) are included here to further support our claim that the role of focus in *mei* is to restrict the event description in the background part, which serves as the restrictive domain for

the quantification of *mei*. Hence, since the restrictive domain resulted from such a mapping mechanism would constitute a nearly unrestricted set of situations in the case of (18), resulting in semantic anomaly, it is not surprising that (18) would convey a different reading, which can be a reading not appealed to the mapping mechanism of *mei*.

In order to show further how the non-focused part helps structure the background part of *mei* 'not', consider (16) as well.

(16) *Wo mei(you) gen-[**XiaoZhang**]f qu kan dianying.*
I not(have) with-XiaoZhang go see movies

b. Default Interpretation of (16):
λC ~∃e [e∈C & Kan-dianying(e) & Subject(e, wo) & Past(e)] [Kan-dianying(e) & Subject(e, wo) & With(e, XiaoZhang) & Past(e)]
Reading derived from (b):
"For some (relevant) movie-seeing event performed by me, there exists no such event of my seeing movies with XiaoZhang."
i. "I didn't go to see movies with XiaoZhang and not with Xiaoli either."
ii. "I didn't go to see movies with XiaoZhang, and I went alone.
iii. ??"I didn't go to see movies with XiaoZhang, because I didn't go to the movies."
Non-focused reading:
~∃e [Kan-dianying(e) & Subject(wo, e) & With(XiaoZhang, e) & Past(e)]
Reading derived from (c):
"I didn't go seeing movies with XiaoZhang."
i. "I didn't go to see movies with XiaoZhang, because I didn't go to the movies."

Again, *mei* 'not' in (16) is recaptured as ~∃e in (16b). In fact, what (16) requires is the speaker did not go to see movies with XiaoZhang, and whether the speaker went alone or did not go to see with individuals other than XiaoZhang would not affect the truth or the falsity of the sentence, as long as s/he did go seeing movies. To capture such a meaning, we need to examine (16b). (16b) states that for the (relevant) movie-seeing events, there exists no such an event of the speaker having gone to the movies with XiaoZhang". It allows that there were other people (on the list) with whom the speaker did not go or the speaker went alone. Like (14), focus does play a role in structuring the background part of (16) by providing the non-focused part, rendering a background part of [e∈C & Kan-dianying(e) & Subject(e, wo) & Past(e)]. Such a background part allows the speaker having seen a movie alone, and presupposes the existence of some (relevant) movie-seeing event. It allows such a movie-seeing event be taken from a contextually salient set determined by the variable *C*, which is in the form of the event description given in the background part, namely *Kan-dianying(e, wo)*.

The presence of the event description as the restrictor part is what differentiates the reading given in *mei* as a dyadic operator in (16b) and the non-focused reading in (16c). When there is no focus, *mei* negates the existence of the event "the speaker having gone to the movies with XiaoZhang", and serves as a unary operator, with no tripartite structure triggered. Consequently, the presupposition that the speaker went to the movies boils down to some kind of pragmatic inferences, with its denial as performing some kind of "metalinguistic negation". This is shown in (16c) where denying the happening of the movie-seeing event does not sound awkward, which does not give the desired reading of (16). In other words, despite the fact that *mei* does not directly associate with focus, focus does play a role in contributing an event description as its restrictor or background part, and the tripartite structure partition is what distinguishes the desired reading in (16b) from the non-focused reading in (16c).

Like (14), if the speaker wants to deny the whole event(s), i.e. going to see movies with XiaoZhang, not just the event(s) of movie-seeing, the stress will naturally fall on *mei(you)*, as shown in the following example.

(19) a. *Ni gen XiaoZhang qu kan dianying le*?
you with XiaoZhang go see movies ASP
"Did you go to the movies with XiaoZhang?"

b. *Wo **MEI(-YOU)** gen XiaoZhang/ta qu kan dianying.*
I not(-have) with XiaoZhang/he go see movies
"I DIDN'T go to the movies with XiaoZhang."

Note that (b) does not exclude the possibility that the speaker did not go to the movies with Xiaoli either. However, if the focus is placed on *XiaoZhang*, XiaoZhang has to be the only person that the speaker did not go to the movies with.

Finally, note that like (14), one may argue that it is also possible to convey readings like (16d), on top of the default reading already given in (16b).

(16) d. Possible interpretation of (16):
$\lambda C \sim\exists e\,[e \in C \,\&\, \exists x\colon C(e) \,\&\, \text{Kan-dianying}(e) \,\&\, \text{Subject}(e, \text{wo}) \,\&\, \text{With}(e, x) \,\&\, \text{Past}(e)]\,[\text{Kan-dianying}(e) \,\&\, \text{Subject}(e, \text{wo}) \,\&\, \text{With}(e, \text{XiaoZhang}) \,\&\, \text{Past}(e)]$
Reading derived from (d):
"For some (relevant) movie-seeing event which I went with somebody, there exists no such event of my having gone with XiaoZhang."
i. "I didn't go to the movies with XiaoZhang and not with Xiaoli either."
ii. "I didn't go to the movies with XiaoZhang, but I did go with someone else."
iii. ??"I didn't see a movie with XiaoZhang, because I didn't go to the movies."

In contrast with (16b), (16d) suggests the existence of at least one individual (not XiaoZhang) with whom the speaker has gone seeing movies. Like (14d), since no exclusive reading is triggered on the focus part, such an existential presupposition cannot possibly be resulted from a focus-background partition as in (16a). (16d) in fact patterns with (16b) in that what is in the background is some (relevant) movie-seeing event performed by the speaker, given by the non-focused part which contributes to the event description in the background. The reading given by (16d) is "For some (relevant) movie-seeing event which involves the speaker having gone with someone x, it did not include the one that the speaker having gone with XiaoZhang". Like (14d), the existential import of "someone" in the background part of (16d) gives a more restricted backgrounded event description by selecting a smaller subset of events from *C* as compared to that conveyed in (16b), but on a par with (14d), such an existential import is inferential in nature and is defeasible upon contextual accommodation. The basic requirement of (16) is the occurrence of some (relevant) movie-seeing event. If it happens that the speaker always goes to see movies alone, contextual accommodation will result in the defeasibility of such an existential inference, and has the presupposition to be accommodated to some (relevant) movie-seeing event which the speaker went with nobody.

(14) has focus placed on the object, and (16) on adjunct. Before concluding, let us consider cases where we have focus on the topic, to see if the proposed analysis can be extended to the topic position.

(20) [***Pingguo***]**f** *wo mei(-you) chi.*
apples I not-have eat
a. ASSERT<f> [Wo mei(-you) chi f] [f = pingguo]
b. It was apples that I did not eat.

Under the assumption that topic is base-generated at the CP position, the topic *pingguo* 'apples' in (20) is outside the scope of *mei* 'not'. Although *mei* would not be directly associating with focus, the non-focused part which constitutes its restrictor set still needs to be within its scope. Since *pingguo* in (20) is outside the scope of *mei*, it would be predicted that *mei* would serve as a unary operator to perform non-focused negation. The focused topic would be interpreted by some other focus-sensitive operator, assertion operator for instance, giving the interpretation in (20a). The assertion operator ASSERT would trigger a focus-background partition, with the background part being [*wo mei(-you) chi* f]. *Mei* would perform non-focused negation within the background part of the ASSERT, leading to the interpretation of "It was apples that I did not eat", which is the desired reading of (20). (21) is written to contrast with (20).

(21) *Pingguo* **[*wo*]f** *mei(-you)* *chi.*
apples I not-have eat
a. λC~∃e [e∈C & Chi(e) & Object(e, pingguo)] [Chi(e) & Object(e, pingguo) & Subject(e, wo)]
"For some (relevant) apple-eating event, there exists no such event of my having eaten apples."
i. "I didn't eat any apples and neither did Xiaozhang."
ii. "I didn't eat any apples, and I did not know anyone who did/neither did Xiaozhang, Xiaoli, Wangwu……"
iii. ??"I didn't eat any apples, because no apples were eaten."

With focus placed on the subject *wo* "I", (21) would have the backgrounded event description part to be [Eat(e) & Object(e, the apple(s))], which presupposes the occurrence of the event of "eating-apples", and asserts that my having eaten apples is not a member of this set of events. This gives (21) the desired reading. Since what triggered is not focus-background partition, like all the examples discussed so far, no exclusive reading would be found on the focused the subject, as revealed by the acceptability of (21ai). On the other hand, (21) allows the speaker to utter the sentence without any presupposition of the event to be performed by someone, as shown in (21aii). In another word, as shown earlier, the existential import regarding the individual variable x, which is the subject NP or the agent of the apple-eating event under such a case, is inferential in nature. It can be cancelled upon contextual accommodation, which naturally accounts for the acceptability of (21aii). Finally, (21aiii) shows that the existential presupposition of event is semantic in nature, and since what is in the restrictor part is [Eat(e) & Object(e, the apples)], the apple-eating event is presupposed to have occurred, and denying the consumption of the apples in (21aiii) would therefore lead to semantic oddity.

To summarize, the quantificational structure of *mei* is proposed to be as follows:

(22) Quantificational structure of Chinese *mei(-you)* as a negative existential quantifier of situations
~∃e [TP- focus] [TP]
OP restrictor nuclear scope

(22) naturally follows from the claims explicated below.

i. The syntactic constraint of *mei*(*-you*) 'not(-have)' leads to its inherent quantificational nature as a negative existential event quantifier, represented as ~∃e in (22).
ii. The role of focus in *mei*-sentences is to provide the non-focused part to contribute the backgrounded event description. Material within the TP scope of

mei, excluding the focus, will be structurally mapped to the background part, to set up its restrictive domain and everything within its scope to the nuclear scope. The event description in the background part thus indicates what the sentence is about, with the nuclear scope asserting that for some (relevant) event denoted by the background part, there exists no such an event denoted in the nuclear scope.

iii. Since what constitutes the restrictor part is the event description and focus is removed altogether when structuring the restrictive domain of *mei*, the only semantic presupposition triggered in *mei*-negation is the existence of at least one relevant event, which is non-defeasible, with no existential import of at least one alternative to the focus.

iv. As the mapping in (22) is not focal mapping and represents a kind of mapping which is triggered by the lexical semantics of *mei*, the absence of an exclusive reading on the focus thus naturally follows.

On the other hand, unlike *mei*, if *bu* is assumed to be focus-sensitive, when there is focus within the focus negation domain of *bu, bu* will associate with the focus, triggering a focus-background partition. Since the mapping mechanism which sets up the background part of *bu* is focal mapping, this would lead to the following consequences:

i. An exclusive reading is found on the focus part.

ii. The non-focused part is mapped to the background, with the focused item replaced by a variable f in it. Under such a mapping, the existence of the relevant event is presupposed, and the existence of at least one alternative to the focused item is also semantically presupposed in the background part.

The different role of focus in *bu*- and *mei*-sentences clearly reflects the distinct focus-sensitive nature of the two negators. Therefore, *bu* and *mei* cannot be the same regarding their dependency on focus, and it is exactly such a contrast in focus sensitivity that leads to the different interpretations of *bu*- and *mei*-sentences as mentioned at the very beginning of this paper in Section 1. Moreover, the above analysis of *bu* and *mei* also supports the prediction borne out in B&C's analysis on English "only" and "always": even within the class "negators", they vary in their focus sensitivity and do not form a homogeneous group.

5. Discussion: Information-structural characteristics of *bu, mei(-you)* and *bu-shi*

In previous sections, I have argued that *mei* 'not' is inherently attached to its adjacent verb *-you* 'have'. Like *mei, bu* 'not' is also found to be syntactically attached to a lexical verb *shi*, a focus marker, with *bu-shi* 'not-be' marking contrastive focus morpho-syntactically. If this is the case, would *bu-shi* and *mei(-you)* share any commonalities, particularly in terms of information-structural properties? In what follows, I will briefly examine *bu-shi*. It is not possible to give a comprehensive analysis of *bu-shi* here, which is included to make a contrast with the properties concluded for *mei(-you)*. Preliminary conclusion would suggest that *mei(-you)* does not behave like *bu-shi*, and the three negators, *bu, mei(-you)* and *bu-shi*, in fact demonstrate their own information-structural properties.

To begin with, consider the contrast between *mei(-you)* and *bu-shi* demonstrated below.

(23) a. *Wo mei(-you) gen XiaoZhang qu kan dianying.*
I not(-have) with XiaoZhang go see movies
"I did not go to the movies with XiaoZhang."

b. *Wo bushi gen* [***XiaoZhang***]**f** *qu kan dianying.*
I not-be with XiaoZhang go see movies
"It was not with XiaoZhang with whom I went to the movies."
i. SHI [Wo gen f qu kan dianying] [f ≠ XiaoZhang]

(24) a. *Wo bushi gen* [***XiaoZhang***]**f** *qu kan dianying,*
I not-be with XiangZhang go see movies
??*(wo mei(-you) gen renheren qu kan).*
(I not(-have) with anyone go see)

b. *Wo bushi gen* [***XiaoZhang***]**f** *qu kan dianying,*
I not-be with XiaoZhang go see movies
??(*wo genben mei(-you) qu kan*).
(I in-fact not(-have) go see)

c. *Wo bushi gen* [***XiaoZhang***]**f** *qu kan dianying,*
I not-be with XiaoZhang go see movies
(wo ye bushi gen [***XiaoLi***]**f** *qu kan.*)
(I also not-be with Xiaoli go see)
"It was not XiaoZhang with whom I went to the movies, and it was not Xiaoli, either."

d. *Wo bushi gen* [***XiaoZhang***]**f** *qu kan dianying,*
I not-be with XiaoZhang go see movies
(wo shi gen [***Wangwu***]**f** *qu.)*
(I be with Wangwu go)
It was not XiaoZhang with whom I went to the movies. It was Wangwu.

Assume that (23b) is uttered under the context that the speaker and the hearer are sharing a list of individuals with whom the speaker would not go to the movies. In line with Yeh (1995), I take the position that *bu-shi* 'not-be', as the negative counterpart of the focus marker *shi* 'be', signals an objection to a focused element of a sentence,[11] presumably its c-commanding constituent, with its corresponding focus-background partition triggered. With such an assumption put in place, as *bu-shi* scopes over the PP *gen-XiaoZhang* 'with-XiaoZhang' in (23b), it would explicitly mark *XiaoZhang* to be the focus, giving a background part of [*Wo gen f qu kan dianying*], as explicated in (23bi). The oddity of (24b) clearly shows that the background part in question would derive the existential presupposition of (some) relevant movie-seeing event, and the existential presupposition of at least one alternative to the focused constituent *XiaoZhang*, as shown by the oddity of (24a).

However, unlike the case of *bu*, (23c) does not have an exclusive reading on the focus, meaning that besides XiaoZhang, it does allow the speaker not go to the movies with other individuals in the list, as evidenced by the acceptability of (23c). This can be accounted for by the nature of *bushi*-negation. Yeh (1995) pointed out that the use of *bu-shi* is to reject and refer to a focus of a sentence, accounting for its occurrence in constructions of metalinguistic negation and contrastive negation. In line with Yeh and having assumed that the focus involved here is contrastive focus, it is natural that an exclusive reading would not be imposed on the focused constituent. Such a claim is best shown by (24d) where the negative clause in which *bu-shi* occurs, namely the rejecting clause *Wo-bushi-gen-XiaoZhang-qu-kan-dianying* "It was not XiaoZhang with whom I went to the movies" marked by *bu-shi*, is found to be naturally followed by a rectified clause, *Wo-shi-gen-Wangwu-qu* "It was Wangwu with whom I went" introduced by the focus marker *-shi. XiaoZhang* is made in contrast with the item marked by *-shi* 'be', *Wangwu*, with contrast naturally fallen on the two items. With all these assumed to be true, consider the focus-background partition given in (23bi). (23bi) indicates that the focus *XiaoZhang* is mapped to the nuclear part, and the background part and the nuclear part gives a relation R that there exists an individual that the speaker went to the movies with, but that individual is not *XiaoZhang*. Therefore, (23bi) only requires the relation R be satisfied, and whether there exist other individuals in the list with whom the speaker did not go to the movies would not affect the truth or falsity of the sentence, which correctly predicts the reading of (23b).

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11. Yeh states that *shi* in *bushi* functions as both a focus marker and an assertion marker: as a focus marker, its negative counterpart is *bushi*, and as an assertion marker, its negative counterpart is *bu or mei(you)*. I will focus our discussion on the former case.

Summarizing, *bu-shi* 'not-be' presupposes the occurrence of the event and the existence of at least one alternative to the item marked by *bu-shi*, but it imposes no exclusive reading on its focused item. Moreover, *-shi* 'be' is used as a focus marker, and *bu-shi*, as its negative counterpart, performs contrastive negation by rejecting the focus marked by *-shi*. Although the morphological relation between *bu* and *-shi* and *mei* and *-you* may not be equivalent,[12] negation of *bu-shi* to a certain extent patterns with that of *mei(-you)*, as the two are constrained by their syntactic attachment to their adjacent verbs, namely *-you* and *-shi*, respectively. Therefore, on a par with *mei(-you)*, one would predict that focus negation of *bu-shi* is also subject to syntactic constraint, which is borne out in the examples below.

(25) a. *Wo bu shi gen* [***XiaoZhang***]**f** *qu kan dianying.*
I not be with XiaoZhang go see movies
"It was not XiaoZhang with whom I went to the movies."
b. *Wo gen* [***XiaoZhang***]**f** *bu shi qu kan dianying.*
I with XiaoZhang not be go see movies
"It was not having gone to the movies that did with XIAOZHANG."
Not "It was not XiaoZhang with whom I went to the movies."

(25a) is adopted from (23b). The PP *gen Xiaozhang* "with Xiaozhang" is within the c-commanding domain of *bu-shi* 'not-be', which, as argued, would naturally be interpreted with the negator. On the other hand, if *bu-shi* is negating the VP *qu-kan-dianying* 'go-see-movies", *bu-shi* would have to float to a position where the VP is within its c-commanding domain, as in (25b), and under such a case, even if focus is placed on *Xiaozhang, bu-shi* fails to interpret with it, or else (25b) would have the interpretation "It was not XiaoZhang with whom I went to the movies", which does not give the intended reading of (25b). (26b) gives the reading of "It was not having gone to the movies that I have done with XiaoZhang (this individual)", with the focus *Xiaozhang* be interpreted by some other focus-sensitive operator, the assertion operator for instance, giving an additional emphatic meaning to the focus.

On the basis of the above, the three negators *bu, mei(-you)* and *bu-shi* show the following distribution in terms of their information-structural characteristics.

12. The reviewer pointed out that *shi* and *bu* can be separated from each other, but not *mei* and *you*, which is true to a certain extent. However, in spite of this, if we assume *bu* to be the negation form of the affirmative marker *-shi*, and *mei* to be the negation form of the existential *-you*, *bu-shi* and *mei*(*-you*) are comparative in respect of the relation with focus.

Table 1. Information-structural characteristics of negators in Chinese

	Exclusive reading on the focused item	Existential presupposition of events	Existential presupposition of the focused item	Subject to svntactic constraint	Focus effect
Bu 'not'	+	+	+	–	(i) Direct association of focus, with focus-background partition triggered
Mei(-you) 'not (-have)'	–	+	–	+	(i) No direct association with focus (ii) Non-focused pan helps restrict the set of events in the restrictive domain
Bu(-shi) 'not (-be)'	–	+	+	+	(i) No direct association with focus (ii) Marking contra stive focus through the focusing verb *shi* 'be'

Results echo what has been pointed in Yeh (1995) that unlike English "not" which has dual roles realized by one negator, Chinese *bu/mei(-you)* and *bu-shi* divide their labor between rejecting a prior utterance and negating the proposition of a sentence (see Table 1).

However, if one considers how syntax and semantics divide their labor in determining the information-structural properties, *mei(-you)* 'not(-have)' and *bu-shi* 'not-be' in fact fall into a natural group, which is distinct from *bu*. Both *mei(-you)* and *bu-shi* share the common property that syntax has inherently determined the negator to be attached to its adjacent verb, which in turn would determine the semantics of the negator itself, with the syntactic constraint not possible to be overridden by semantics. In other words, the attachment of *mei* 'not' to *-you* 'have' has pre-determined *mei* to be a negative existential quantifier of situations, and the attachment of *bu* 'not' to *-shi* 'be' makes *bu* as a negator which rejects its c-commanding constituent. Information-structural properties of the two negators are also pre-determined by *-you* and *-shi*.

First, *mei(-you)* and *bu-shi* share a common property that exclusive readings are absent in both of them. In the case of *mei(-you), mei* has to be attached to *-you* morpho-syntactically, with focus failing to override such a constraint, and focus-background partition therefore cannot be triggered, hence the absence of exclusive reading on the focused constituent. On the other hand, in the case of *bu-shi*, since *-shi* is itself a focus marker, unlike the negator *bu* which associates with focus

directly, *bu* in *bu-shi* can only do so through its attachment to focus marker *-shi* and what *bu-shi* marks is a contrastive focus, which explains the contrast between *bu-shi* and *bu* in terms of exclusive readings.

Second, with *mei* being a negative existential quantifier of situations and *bu* attaching to focus marker *-shi*, individual mappings are triggered by the two negators, which have determined the two negators to vary in terms of the existential presupposition of the focused item. *Mei* does not presuppose the existence of an alternative to the focused constituent, as focus is deleted from the restrictor part. Contrarily, focus-background partition is still triggered in the case of *bu-shi*, though under the condition that the relevant syntactic constraint has to be satisfied first, and the focus variable in the background part would therefore presuppose the existence of an alternative to the focused constituent. At this point, *bu* and *bu-shi* are the same regarding such a presupposition, as both involve focus-background partitions. Yet, an underlying difference between *bu* and *bu-shi* has to be noted: while direct association of *bu* with focus is possible, with focus possibly expanding the negation domain of *bu*, association of *bu-shi* with focus is syntactically constrained to its c-commanding constituent.

Furthermore, another interesting fact is that conclusions shown in the table have naturally called for a division of labour between two types of negators in Chinese: (1) negators with morpho-syntactic properties pre-determining the information-structural properties of the negator itself, like *mei(-you)* and *bu(-shi)*, and (2) negators which are not bound to any inherent morpho-syntactic constraints, like *bu* and English "not". While semantics play a prime role in determining the information-structural properties of type (2) negators, syntax plays a more crucial role in type (1) negators. This is reflected in their focus-sensitive nature demonstrated in the table: direct association of *bu* with focus shows that *bu* is focus-sensitive; and as have been argued in this paper, direct association of *mei* with focus would lead to semantic deviation and *mei* is relatively focus-insensitive. If *bu* and *mei(-you)* occupy two extremes in terms of focus-sensitivity, *bu-shi* would fall in between the two. Its attachment to *shi* makes it possible to interpret with focus within its c-commanding domain, but since focus interpretation is performed through syntactic attachment, it is still bound by syntax. Focus-background partition is triggered only after the syntactic constraint has been satisfied, making its focus-sensitive behavior incomparable with *bu*.

Finally, the different focus-sensitive nature demonstrated in *bu, mei(-you)* and *bu-shi* naturally leads to an important theoretical consequence. Negators in Chinese do not form a homogeneous group in terms of information-structural properties and have demonstrated a more complicated or diverse division of labor between syntax and semantics. The cases of *bu, mei(-you)* and *bu-shi* have suggested at least two possibilities: (1) negation solely determined by semantics, with

semantics overriding any possible syntactic constraints, as in *bu*; and (2) negation pre-determined by syntax, with semantics failing to override syntactic constraints, as in *mei(-you)* and *bu-shi*. However, further work which involves more cross-linguistic data would be needed if a landscape of negators is to be constructed.

6. Conclusions

In this paper, I have demonstrated that *bu* 'not' and *mei* 'not', though both are negators in Chinese, vary in their degree of dependency on focus: *bu* is assumed to be a focus-sensitive operator, with its interpretation totally dependent on the placement of focus, if there is one. Focal mapping would then be triggered upon its direct association with focus. On the other hand, I argued that *mei* does not lexically encode a dependency on the placement of focus, and its seemingly focus sensitivity results from its dependency on the non-focused part. This makes *mei* to be at most indirectly affected by focus.

Moreover, I have argued that the focus-insensitive nature of *mei* is due to the failure of semantic focus to override the syntactic constraint of *mei*, which requires it attach to its adjacent lexical verb *you* 'have', a quantifier asserting the existence of a situation. Through negating *you, mei* is thus assumed to be a negative existential quantifier of situations under our account, with its quantification structure determined in the following way: material within the TP scope of *mei*, excluding the focus, will be structurally mapped to the background part, to set up the restrictive domain for *mei*, with everything within the scope of *mei* to the nuclear scope for negation. The restrictive domain resulted from such a mapping of *mei* would lead to the following consequences:

i. regarding the relation between the restrictor and the nuclear scope, the set of events in the restrictive domain gives the event description in the background part, which indicates what the sentence is about, with the nuclear scope asserting that there exists no such an event denoted in the nuclear scope (cf. Herburger 2000).
ii. Regarding the presupposition triggered in the background part, the restrictive domain of *mei* would trigger an existential presupposition of some (relevant) event, which is a member of a contextually salient set of events. Moreover, since the focus is completely missing in the background part of *mei*, the existence of at least one alternative to the focus is not semantically presupposed in the background part.
iii. Since what triggers is not focal mapping, no exclusive reading would be found on the focus in the *mei*-sentences.

Hence, the discussion of *mei* in this paper also demonstrates another role of focus in contributing to the background part: the background part can simply be made up by deleting the focus, with the residual mapped to the background to contribute to the backgrounded event description. While the backgrounded event description presupposes the existence of some (relevant) event, the absence of the focus variable in the background would not lead to the existential presupposition of at least one alternative to the focused item semantically. This is different from the standard way of forming the background – replacing the focus by a variable and mapped the residual including the focus variable to the background (cf. Jackendoff 1972; Jacobs 1983; von Stechow 1991; Rooth 1985, 1992, 1996; Krifka 2006, among others), which is the operation involved in the case of *bu*, a genuine focus-sensitive operator.

Importantly, the above analysis of *bu* and *mei* would lead to the following theoretical consequence – though falling under the same category, negators do not necessarily demonstrate the same focus dependence, and hence, they do not form a homogeneous class regarding their focus-sensitivity. This is evidenced in *mei* and *bu*, a point which is not well-recognized in previous analyses.

Finally, with *bu-shi* 'not-be', a focus marker in Chinese, taken into account as well, the paper has shed some lights on how focus helps shape negation in our natural language. Negation performed by *bu, mei(-you*) 'not(-have)' and *bu(-shi)* reveal two possible types of negation in natural language: (1) negation solely determined by semantics, with semantics overriding any possible syntactic constraints, as in *bu*; and (2) negation pre-determined by syntax, with semantics failing to override syntactic constraints, as in *mei(-you)* and *bu-shi*. However, how far this can be applied to other languages would be an issue subject to further research and more cross-linguistic data.

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CHAPTER 10

Null object constructions, VP-ellipsis, and sentence interpretation

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This paper discusses issues related to VP-Ellipsis and null object constructions in Mandarin Chinese. It consists of two parts. First, pace Li (1998) and Xu (2003), but in line with Huang (1988a, b, 1991), the paper argues that it is not true that no null object construction (NOC) sentences can be analyzed as VP-ellipsis in Mandarin Chinese, and it will show that the reason for the fact that the interpretation patterns of the relevant sentences deviate from those of their English counterparts is not because there is no VP-ellipsis in Chinese but because Chinese pronouns and reflexives exhibit some special properties different from those in English. The claim in this paper is that the so-called NOC sentences are ambiguous in structure and can be analyzed as either VP-ellipsis or NOC. Second, pace Kehler (1993), the paper claims that it is not the parallel vs. non-parallel distinction but the semantic and discourse constraints of coordinate constructions with *too* and *ye* 'also' in VP-ellipsis that help explain why some VP-ellipsis sentences are ungrammatical in English and Mandarin Chinese, respectively. Hence, the coordination construction in neither English nor Chinese is constrained by the so-called syntactic condition which is based on the parallel vs. non-parallel distinction, as proposed in Kehler (1993), and discourse factors play a crucial role in the interpretation of coordination construction in the two languages concerned.

1. Arguments for and against the VP-ellipsis analysis of the null object construction

It is argued that the null object construction (NOC) in Chinese, Japanese, and Korean can be analyzed on a par with the VP-ellipsis in English after V-to-Infl raising and VP deletion (Huang 1988a, b, 1991; Otani and Whiteman 1991), as exemplified in (1) below.

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(1) a. Zhangsan kanjian-le tade mama, Lisi ye kanjian-le.
Zhangsan see-PERF his mother Lisi also see-PERF
'Zhangsan$_i$ saw his$_i$ mother, and Lisi$_j$ also saw his$_{i/j}$ mother.'
b. Lisi ye [$_{INFL}$ [$_V$ kanjian-le] [$_{VP}$ t$_V$ [$_{NP}$ ec]]]
Lisi also see-PERF
'Lisi also saw his$_{i/j}$ mother.'

(2) a. John$_i$ saw his mother, and Bill$_j$ [$_{INFL}$ did [$_{VP}$ ec]], too.
b. Bill$_j$ saw his$_{i/j}$ mother.

The second clause in (1a) can have the structure in (1b), where the verb *kanjian* 'see' is raised to INFL. Since the head V and the complement NP are both empty, the whole VP can be considered as an empty category that is similar to the second clause of (2a), which has both sloppy and strict readings, as shown in (2b): the sloppy reading with the pronoun *his* coindexed with its local subject, the *j* reading of *his*; and the strict reading with *his* interpreted with the subject of the first conjunct, the *i* reading of *his*. It is claimed that the second clause in (1a) also has the strict and sloppy readings, similar to that in (2a) (Huang 1988a, b, 1991).

Two arguments have been presented for the VP-ellipsis analysis of NOC: (i) Sentences like (1a) exhibit the strict/sloppy ambiguity, typical of VP-ellipsis; and (ii) NOC sentences also show the locality effect of the VP-ellipsis for the sloppy reading (e.g. Huang 1988a, b). The first argument comes from the availability of both sloppy and strict readings in sentences like (1a), just like the corresponding English sentences like (2a).

The second argument is based on the sentences, as given in (3) and (4) below. Like the sentence in (3a), the second clause of the Chinese sentence in (4) can only have the local subject *Lisi* as the antecedent of the possessive pronoun *tade* 'his/her' for the sloppy reading (Huang 1988a, b), namely that the pronoun in question cannot have *Mary* as its antecedent for the sloppy reading, as indicated in (3b) for the second clause of (3a) and the English translation for (4).

(3) a. John$_i$ saw his mother, and Mary$_j$ knew that Bill$_k$ did, too.
b. Mary$_j$ knew that Bill$_k$ saw her$_{*j}$/his$_k$ mother.

(4) Zhangsan kanjian-le tade mama, Mary zhidao Lisi ye kanjian-le.
Zhangsan see-PERF his mother Mary know Lisi also see-PERF
'Zhangsan$_i$ saw his$_i$ mother, and Mary$_j$ knew that Lisi$_k$ also saw her$_{*j}$/his$_k$ mother.'

However, Hoji (1998), Li (1998), Oku (1998), Tomioka (1998), Kim (1999), and Xu (2003) argue against the VP-ellipsis (VPE) analysis for Japanese, Korean and Chinese NOCs, respectively. In this paper I will just concentrate on Li's arguments, as given in (5), which I consider to be the most comprehensive, though she has

changed her position completely in Li (2002). I will first present Li's arguments against the VP-ellipsis analysis of Chinese NOCs, and then discuss the problems in Li's account in the next section. In the third section, I will give four pieces of new empirical evidence to support my modest claim that NOCs are ambiguous in nature and can be analyzed as either VPE or NOC.

(5) a. Although the sloppy reading is obligatory or much preferred for anaphors and optional for pronouns, Chinese examples involving reflexive *ta-ziji* '3s-self' can also have a strict reading;
b. The so-called VP-ellipsis sentences involving *bici* 'each other' do not have the "couple-internal reading" like their counterparts in English;
c. No locality effect for the sloppy reading in Chinese;
d. The sloppy reading in Chinese is really a sloppy-like reading, as suggested in Hoji (1998), and it can even occur with proper names; and
e. Even with no V-to-INFL raising, the sloppy identity reading is still allowed.

At first, unlike English which does not allow a reflexive to have a strict reading, as shown in (6b), for the second clause of (6a), Li claims that it is very easy to get the corresponding Chinese reflexive to have the strict reading, as shown in (7b), for the second clause in (7a).

(6) a. John criticized himself, and Bill did, too.
b. ??Bill criticized John.

(7) a. Zhangsan piping-le ta-ziji, Lisi ye piping-le.
Zhangsan criticize-PERF he-self Lisi also criticize-PERF
b. Lisi criticized Zhangsan.

Li (1998, 2002) claim that she can even get a reading in which Lisi criticized someone other than *Zhangsan* and *Lisi*, which is salient in the discourse, for the second clause in (7a). However, it is very hard for my informants to get this reading. The only way to get this reading, I think, is to say that the first clause and the second clause are two consecutive sentences in a discourse, and they belong to two different discourse utterances.[1] That is, they do not form a conjoined sentence, as required. Hence, it is not appropriate to claim that sentences like (7a) can have a reading for the null object in the second clause in which Lisi criticized someone other than *Zhangsan* and *Lisi*, since this reading is not relevant for the discussion in question.

Secondly, Li claims that the contrast between Chinese sentences and English sentences, as given in (8) and (9), indicates that Chinese NOC sentences are different from English VP-ellipsis sentences.

1. Thanks to Liejiong Xu (p.c.) for pointing out this possibility to me.

(8) a. Every Chinese couple recommended each other's friends, and every German couple did, too.
b. Every German couple recommended each other's friends.

(9) a. Meidui Zhongguo fufu tuijian-le bicide
Every-CL China couple recommend-PERF each-other's
pengyou, meidui Deguo fufu ye tuijian-le.
friend every-CL German couple also recommend-PERF
b. #Every German couple recommended each other's friends.

This is because only the second clause in (8a) (not that in (9a)) can have the so-called "couple-internal reading", as given in (8b) and (9b), respectively. Note that the symbol # in (9b) is used to indicate that the relevant reading is not appropriate for the second clause of (9a).

Thirdly, sentences like (10) and (11) below suggest that only the English sentences observe the so-called locality effect when the relevant pronoun in the second clause of the conjoined sentences is interpreted as a bound variable.

(10) a. Mary fed her child, and Susan thought that the nanny did, too.
b. #Susan thought that the nanny fed Susan's child.

(11) a. Mary wei-guo zijide haizi le, Susan yiwei Wu ma ye
Mary feed-EXP self's child PRT Susan think Wu ma also
wei-guo le.
feed-EXP PERF
'Mary fed her (own) child, and Susan thought that the nanny *Wu ma* fed her child, too.'
b. Susan thought that the nanny *Wu ma* fed Susan's child.

This is because the second clause in (10a) cannot have the sloppy reading for the relevant pronoun, as indicated in (10b), while that in (11a) can have the relevant reading, as indicated in (11b). Hence, Chinese NOC sentences do not observe the locality effect, and Li thus reasons that they cannot be analyzed as the counterpart of VP-ellipsis in English.

Fourthly, following Hoji (1998), Li claims that the sloppy reading, as seen in sentences like (1), is really a *sloppy-like* reading, as we can even see it in sentences that do not contain any pronoun, as exemplified by the contrast between the Chinese and English sentences in (12) and (13).

(12) a. John punished John's students, and Bill did, too.
b. #Bill punished Bill's students.

(13) a. Zhangsan chufa-le Zhangsan-de xuesheng, Lisi
Zhangsan punish-PERF Zhangsan-DE student Lisi
ye chufa-le.
also punish-PERF
'Zhangsan punished Zhangsan's student, and Lisi did, too.'
b. Lisi punished Lisi's students.

Note that, when the first conjunct does not contain a personal pronoun, the second conjunct in the English sentence (12a) does not allow a sloppy reading like (12b), though the relevant Chinese sentence does. Since there is no possibility of a sloppy reading in the first conjunct, the availability of that reading in the second conjunct of the Chinese sentence in (13a) has to be explained by conditions that are different from those for English VP-ellipsis.

Finally, sentences like (14) argue against the V-to-INFL raising analysis, since the INFL position is occupied by an auxiliary *hui* 'will', and it thus prevents the verb *tuijian* 'recommend' from being raised to INFL.

(14) Zhangsan hui tujian zijide xuesheng, Lisi ye hui tuijian.
Zhangsan will recommend self's student Lisi also will recommend
'Zhangsan will recommend his own students, and Lisi will, too.'

Because the verb cannot be raised to INFL, the only possible analysis is to say that sentences like (14) have a null object construction, that is, only the object, i.e., not the VP, is elided. Although there is no VP-ellipsis in (14), the sloppy reading is available for the second conjunct in (14). Hence, Li concludes that the NOC sentences in Chinese are different from those in English, and have to be analyzed as non-VP-ellipsis constructions, e.g. the null object construction or NOC.

2. Problems for Li (1998)

For (5a), Chinese reflexive *ta-ziji* differs from English *himself* in allowing long-distance antecedents in non-contrastive contexts, as exemplified in (15), and it can even have an antecedent beyond the sentence it appears, as shown in (16) (Pan 1996, 1997, 1998).

(15) Zhangsan zhidao zheben shu hai-le ta-ziji.
Zhangsan know this-CL book hurt-PERF he-self
'Zhangsan knew that this book hurt him.'

(16) Ni wen ta-ziji qu.
you ask he-self go
'Go ask HIMSELF.'

The first conjunct *Zhangsan piping-le ta-ziji* in (7) can even have a reading that gives rise to the strict reading: λx[x criticized Zhangsan'](Zhangsan'), which is different from the sloppy reading: λx[x criticized x](Zhangsan'). Note that the difference between the two readings is typically that the latter has TWO but the former only has one, of its arguments bound by the lambda operator. We could say that only the latter contains a reflexivised predicate, which helps derive the sloppy reading, though the former can never derive such a reading.

Actually, English does allow strict readings for anaphors, as shown below, where 'his lawyer did' means that his lawyer defended John, not himself.

(17) John$_i$ defended himself$_i$ against the accusation better than his$_i$ lawyer did.

For (5b), we think the relevant reading is possible, as indicated by the gloss in (9′) below. This reading will be much clearer if we change the VP into *zhidao bici de quedian* 'knew each other's weakness'.

(9′) Meidui Zhongguo fufu zhidao bicide quedian, meidui
Every-CL China couple know each-other's weakness every-CL
Deguo fufu ye zhidao.
German couple also know
Possible: Every German couple knew each other's weakness.

For (5c), I don't think it is possible to violate the locality constraint. Even if we accept the fact that Chinese NOC sentences do not exhibit the locality effect, as shown in (11), this does not necessarily constitute a problem to the VP-ellipsis analysis of NOC sentences. The reason is that the bare reflexive *ziji* 'self' can have long-distance antecedents and always induces a sloppy reading (Pan 1997, inter alia).

(18) Zhangsan renwei Lisi na-zou-le zijide fenshu, Wangwu ye
Zhangsan think Lisi take-away-PERF self score Wangwu also
zheyang renwei.
so think
'Zhangsan thinks that Lisi took away his score, and Wangwu does so, too.'

One possible reading for the first conjunct in (18) is λx [x thinks that Lisi took away x's score](Zhangsan'), so the second conjunct in (18) will have a similar property applying to *Wangwu'*, i.e. λx [x thinks that Lisi took away x's score] (Wangwu'). If we take the relevant property "λx [x thinks that Lisi took away x's score]" as derived from λx P(x, x's score) using the higher order unification method (Pulman 1997), where P = thinks -that- Lisi- took- away'. Then for the first conjunct of (11a), we can have λx P(x, x's child), where P = feed'. If we say that Chinese allows the copied part from the first conjunct to be λx P(x, x's child), then by higher order unification, we can get P = think-that-Wu-ma-feed, namely that we can have λx [x thinks

that Wu ma fed x's child] applied to *Susan*'. This is a sloppy reading that does not observe the locality effect, though it is compatible with the VP-ellipsis of NOCs. Hence, sentences like (11a) are not necessarily counterexamples to the VP-ellipsis analysis of NOCs.

For (5d), Li claims that one can get a sloppy-like reading, though I can only get the so-called strict reading, namely that Lisi punished Zhangsan's students. It seems to me that there is no way to get the relevant reading semantically unless there is a way to treat both occurrences of Zhangsan in (13a) as variables bound by the same lambda operator. If we take the empty object in the second clause in (13a) to be not a reflexive but a personal pronoun, I see no way of deriving the claimed reading, namely that both arguments are translated into the same variable bound by the lambda operator.

For (5e), sentences like (14) can only suggest that sloppy readings and V-to-INFL raising are not necessarily tied together, and they cannot be used to argue against the VP-ellipsis of NOCs. We can get the sloppy reading in (19a) for the second conjunct in (19b) with the modal *hui* 'will' generated under INFL and V moved to Asp, the head of an aspectual phrase, which is below INFL and takes a VP as its complement, as will be discussed in more details in Section 3.

(19) a. λx[x recommend x's students](Zhangsan')
b. Zhangsan hui tujian zijide xuesheng, Lisi ye hui.
Zhangsan will recommend self's student Lisi also will
'Zhangsan will recommend his own students, and Lisi will, too.'

Chinese has modals like *hui, xiang* 'want', *yao* 'want'. When they are followed by a verb, as in (19b), they are real auxiliary verbs. These verbs do show the interpretation patterns of VP-ellipsis. Hence, we conclude that the strong claim given below is not correct, and the modest claim given below can be upheld for Mandarin Chinese.

Strong Claim: All NOC sentences are analyzed as VP-ellipsis
Modest Claim: NOC sentences are ambiguous in structure. They can be analyzed as VP-ellipsis through a V-to-Asp^0 raising, or sentences with an empty pronominal object, i.e. NOC.

3. The necessity of the two analyses of NOCs in Chinese

In this section I will firstly present two pieces of evidence to support the claim that some NOCs have to be analyzed as VPE in Chinese. Then I will give two other pieces of evidence in favor of the NOC analysis. The fact that NOCs can be analyzed in two different ways further suggests that neither Huang (1988, 1991) nor Xu (2003) and Li (1998) is completely correct. Thus, my modest claim will be the right approach toward the NOCs in Chinese.

Here are the two pieces of evidence in support of a VPE analysis.

First, the missing object within a VP idiom can only be interpreted through VPE. In the generative grammar tradition, idioms, such as idioms of VO structures, are formed and stored in the lexicon. They are base-generated in syntax. Thus, the missing O in the second conjuncts in sentences like (20a–b) can only be recovered in a VPE style. More specifically, "wobiancao" in the second clause of (20a) can only be restored in a VPE analysis, and it is definitely not an empty category in a NOC analysis. The word "sunzi" in the second conjunct of (20b) has to be accounted for in the same manner. The existence of sentences like (20a–b) strongly suggests that (1a) can be given a VPE analysis even if this is not the only analysis.

(20) a. Tuzi dou bu chi wobiancao, ren ye bu yinggai chi
Rabbit Dou not eat grass near its hole, people too not should eat
Lit: 'Rabbit doesn't eat the grass near its hole, people should not, either.

b. Zai yeman shangsi mianqian, Zhangsan zhuang-guo sunzi,
in rude supervisor front Zhangsan pretend-ASP grandson,
Lisi ye zhuang-guo
Lisi too pretend-ASP
Lit: 'In front of the rude supervisor, Zhangsan pretended to be his grandson, Lisi did, too.'

Second, the missing object with a cataphoric referent interpretation can only be derived through VPE. Consider the sentence in (21a) below.

(21) a. Zai gege bei zhuajinqu zhihou, ta ye bei
at elder-brother BEI put in, back he also been
zhuajin-le jianyu
put in-ASP prison
'After his elder brother was put in prison, he was, too.'

b. Jianyi zai chi bale shi buyao xiao pi, zuihao zai
advise when eat guava not peel skin, better before
chi zhiqian xian jiang qi zai shuili jingpao shi fengzhong
eat first make it in water soak ten minutes
'You are advised not to peel off the skin when eating the guava, and you'd better soak it in water for ten minutes before eating.'

Since the missing object in the first conjunct in (21a) is within an adjunct island, cataphorically referring to the object in the second conjunct, a NOC is ruled out, for a base-generated empty category in an adjunct island is not allowed (see Li's 2014 discussion on this constraint). Therefore, the missing object *jianju* "prison" in the first conjunct can only be recovered through a VPE analysis.

The same island constraint applies to the interpretation of the missing object in the second clause in (21b). Furthermore, the fact that there is a linguistic antecedent for the missing object of the second clause in (21b) consolidates the VPE analysis (see a similar argument for Russian in Gribanova 2013a).

In short, the above two pieces of empirical evidence support the claim that the NOC sentences like (1a) in Chinese can be analyzed as a VPE, and sometimes has to be analyzed as a VPE, especially when the first conjunct has a VP idiom.

On the other hand, there are also at least two pieces of evidence in favor of a NOC analysis for the sentences like (1a).

The first piece of evidence concerns the negative polarity items (NPI), which cannot be interpreted as the missing objects in affirmative sentences. Now let's consider (23a). NPIs like *renheren* "anyone" in Chinese can be base-generated at the object positions in negative sentences, as the first conjunct in (23a) shows, though they cannot appear in the canonical object positions in affirmative sentences.

(23) a. Zhangsan mei kanjian renheren, dan Lisi kanjian-le
Zhangsan not see anyone, but Lisi see-ASP
'Zhangsan saw nobody, but Lisi did.'

b. Zhangsan kanjian-le yixieren, dan Lisi mei kanjian
Zhangsan see-ASP someone, but Lisi not see
'Zhangsan saw someone, but Lisi didn't.'

Since *Lisi kanjian-le renheren* "Lisi saw anyone" is doubtlessly ungrammatical, the missing object in the second conjunct in (23a) has to be interpreted as an empty object, and cannot be reconstructed within a VPE analysis. Since a VPE analysis of the second conjunct in (23a) would lead to ungrammaticality, the correct way of its generation and interpretation has to be through NOC.

In addition, the missing objects in negative sentences cannot be indefinite quantificational phrases in Chinese. In comparison with (23a), (23b) is different in the sense that indefinite quantificational phrases like *yixieren* "a few people" can only appear in the canonical object position in affirmative sentences, and their appearance in negative sentences would lead to ungrammaticality, which is exactly the opposite of the NPI sentences. Hence, the ungrammaticality of "Lisi mei kanjian yixieren" rules out a VPE analysis for the recovery of the missing object in (23b) and requests a NOC analysis instead.

The second piece of evidence concerns the missing objects containing "Numerical Phrase + Duration/Frequency Phrases", which cannot be accounted for by a VPE style analysis. To illustrate this point, check the sentences in (24a–b).

(24) a. Zhangsan mai-guo sannian yu, Lisi ye mai-guo
Zhangsan sell-ASP three year fish, Lisi too sell-ASP
'Zhangsan sold fish for three years, and Lisi did, too.'

b. Zhangsan nian-guo sanbian shu, Lisi ye nian-guo, dan
Zhangsan read-ASP three times book, Lisi too read-ASP but
zhi nianle yibian
only read-ASP once
'Zhangsan read books for three times, and Lisi did, too, but he only did once.'

The interpretation of the missing objects in the second conjuncts in (24a–b) is not necessarily *sannian* "three year" or *sanbian* "three times" in the relevant sentences. There are other possible interpretations such as one year, two years, once, twice, etc. (see Xu's (2003) discussion on this point). The fact that there are multiple alternative interpretations for the missing objects in the relevant sentences rules out a VPE analysis and calls for a NOC analysis.

In short, the above four pieces of empirical evidence manifest the duality of NOC sentences in Chinese. Since neither can be reduced to the other, the four pieces of evidence presented above argue for two different syntactic structures of the relevant sentences in question, hence two different analyses of the NOC sentences in Chinese.

Based on Hu et al.'s (2001) proposal that there is no finite vs. nonfinite distinction in Chinese and inspired by Goldberg (2005) and Gribanova's (2013a, b) arguments for Russian VPE phenomena, I contend that it is possible to have a V-to-Asp^0 raising in the relevant sentences in Chinese with the assumption that the Aspect Phrase is located below the T/INFL node, taking a VP as its complement. Note that the V-to-Asp^0 raising analysis is supported by sentences like (25b) and (26b) where the perfective aspectual makers *-le* and *-guo* are attached to the main verb after the verb in question is moved to the Asp head. A VPE structure is derived through the deletion of VP after V-to-Asp^0 raising, while a NOC structure is produced with a base-generated null object *pro*.[2]

2. Note that Aoun & Li (2008) and Li (2014) propose another solution to the controversial NOCs in Chinese. The idea is that there is a base generated True Empty Category (TEC), which is interpreted at LF through copying its antecedent as long as the context allows. Although this analysis can account for the different interpretations of NOC sentences, one unexpected weakness of this proposal is that there is no way for a TEC to arrive at the sloppy reading for the

(25) a. Zhangsan kanjian-le ziji de mama ma?
Zhangsan see-ASP self de mother Q?
'Did Zhangsan see his mother?'
b. Shide, kanjian *(-le).
Yes, see ASP
'Yes, He was.'

(26) Zhangsan shua-guo wan ma?
Zhangsan wash-ASP dish Q
'Did Zhangsan wash the dishes?"
Shide, shua *(-guo).
Yes, wash ASP
'Yes, he did.'

To summarize, since it cannot derive a reflexivized predicate which is necessary for the sloppy reading, the NOC analysis in principle will fail to account the sentences with VP idioms. Since the sentences with NPI and frequency phrases cannot be dealt with by VP-ellipsis, they require the NOC account. Hence both analyses are needed to derive the relevant interpretations for Chinese sentences with a null object.

4. The parallel vs. Non-parallel distinction and sentence interpretation

Kehler (1993) proposes a uniform discourse processing architecture to handle VP-ellipsis by revising the dichotomy between *ellipsis* (surface anaphora) vs. *Model Interpretive Anaphora* (deep anaphora), as given by Hankamer and Sag (1976), Sag and Hankamer (1984). He tries to show that the distinction between parallel vs. non-parallel constructions plays a crucial role in the interpretation of VP-ellipsis in English. In a parallel construction (as exemplified by the sentential structure *A and B too*), there is only one syntactic (propositional) representation available, and the reconstruction of the elided VP in the second conjunct is subject to syntactic constraints such as Binding Conditions A, C, etc. However, in non-parallel constructions such as *A but B, A because B, A better than B*, etc., neither a syntactic

sentences in question. This is because the sloppy reading requires the necessary co-indexation of the two arguments of a predicate, namely a reflexivized predicate. However, the TEC account of the object of a transitive predicate, though being able to arrive at a possible coreference of the object and the subject of the sentence in question, cannot derive the sloppy reading in principle, which is, nonetheless, the key property for some NOC sentences in Chinese. Since a more elaborate evaluation of TEC is far beyond the limit of this paper, I'll leave this topic for future research (See also Tomioka's 2014 comments on Li 2014).

representation is necessary, nor do the syntactic constraints apply. Thus, parallel constructions are like ellipsis and can only access the propositional representation stored in the short-term memory, while the non-parallel ones are closer to Model Interpretive Anaphora (MIA) and should be processed in the discourse model.[3]

The crucial point of Kehler's proposal is as follows: only the propositional representation of the first conjunct in non-parallel constructions is integrated into the discourse model when the elided VP is reconstructed; and only the reconstruction in parallel constructions is subject to syntactic constraints.

With this proposal, Kehler can explain the contrasts between the (a) and (b) sentences below:

(27) a. This problem was to have been looked into, but obviously nobody did. [look into the problem] (Kehler's (3))
b. *This agent retards embryonic development, and the growth cones were too. (Kehler's (7))

(28) a. The lawyer defended Bill better than he could have.
b. *The lawyer defended Bill and he did too. (Kehler's (39))

(29) a. John defended himself against the accusation better than his lawyer did. [defended John] (Kehler's (14))
b. ??John defended himself, and Bob did too. [defended John] (Kehler's (14))

(30) a. First person pronouns aren't very shiftable, although the plural ones can be. (Kehler's (24))
b. *First person pronouns aren't very shiftable, and the plural ones also don't. (Kehler's (25))

(31) a. John read everything which Bill believes he did. (Kehler's (26))
b. *John read everything which Bill believes the claim that he did. (Kehler's (27))
c. Which problem did you think John would solve because of the fact that Susan did. (Kehler's (29))

Sentences like (28b) and (29b) are ungrammatical or strange because of the violations of Binding Conditions C and A, respectively; this explanation holds only if we assume that the elided VPs are copied from the first conjuncts. Sentences (27b) and (30b) are ungrammatical because an appropriate syntactic VP cannot be reconstructed. The corresponding grammatical cases are non-parallel constructions.

3. Note that, although Kehler has recently developed his idea in Kehler 2000, 2002 and Kehler et al. 2008, his basic idea about parallel structures, as proposed in Kehler 1993 and discussed in the present paper, remains (See Kertz 2013 for more criticisms on Kehler's theory).

They are interpreted after the propositional representation of the first conjunct has been integrated into the discourse model, so they are not subject to the relevant syntactic constraints. Sentences (31a, b, c) are explained with the assumption that *which* does not specify an interclausal coherence link, so (31a, b) are parallel constructions while (31c) is not. Thus, the subjacency constraint does apply to (31a, b), but not to (31c). Since there is a subjacency violation in (31b), it is ungrammatical. Note that (31c) is grammatical, as subjacency does not apply to it.

Although Kehler's analysis seems promising and superior to Sag and Hankamer's in the sense that within the ellipsis (surface anaphora) domain, a further distinction must be made between parallel vs. non-parallel constructions. I will argue in this paper that the apparent parallel vs. non-parallel distinction is not correct and thus inadequate to handle all the cases of VP-ellipsis. Although I will not say anything about the cases in (31), I will show that the cases from (27) to (30) are not strict parallel constructions and their corresponding parallel constructions are grammatical if they observe the semantic and discourse constraints for parallel constructions with *too* in general (not just for VP-ellipsis), as proposed in Kaplan (1984). Furthermore, the ones in (28) and (29) can be explained with a discourse approach, the semantics of *too*, and the acknowledgement of the fact that the bound variable and referential readings of pronouns are subject to different constraints: the former obeys a syntactic constraint like C-command (Reinhart 1976, 1983), while the latter is interpreted in the discourse model. Therefore, it is the semantic and discourse factors but not the parallel vs. non-parallel (syntactic and semantic) distinction that constrains the contrasts, as exemplified by the sentences in (27–30).

Actually, there are grammatical sentences similar to the ungrammatical ones in (27), (28), and (30).

(27) b′. This agent retards embryonic development, and the growth cones do too.

(28) b′. The lawyer defended $Bill_i$ and he_i HIMSELF did, too.
b″. The lawyer defended $Bill_i$ and HE_i did, too.

(30) b′. First person pronouns aren't very shiftable, and the plural ones are also not.

One may argue that sentences (27b') and (30b') are grammatical because the reconstructed VP in the second conjunct is the exact copy of the VP in the first conjunct, namely that it is the syntactic parallelism that helps improve the grammaticality of these sentences. However, as discussed in Kaplan (1984), the constraint on the *and … too* construction involves semantic and discourse factors and it does not just apply to VP-ellipsis.

Kaplan (1984) argues that *too*'s obligatoriness in discourse with one semantic difference between the two conjuncts in question stems from its discourse function.

It is the discourse and semantics, which is to emphasize the similarity between the members of a pair of contrasting items. This applies to both VP-ellipsis and non-VP-ellipsis constructions, as shown below:

(32) Jo had fish and Mo had soup (*too).

(33) Jo had fish and Mo did *(too).

(34) Jo wrote the article to debunk Chomsky's claim, and she wrote it to improve her tenure file *(too).

Sentence (32) has two differences and *too* cannot occur with it, but sentences (33) and (34) have only one difference and *too* is obligatory. This contrast shows that in the sentential conjunction construction with *too*, only one semantic difference is allowed. Sentence (34) also indicates that the *and … too* construction, i.e. Kehler's parallel construction, allows MIA, for both *she* and *it* in the second conjunct are MIA's, and their antecedents are both in the first conjunct.

This suggests that Kehler's claim is not correct in the sense that in parallel constructions the only available structure is the propositional representation and both conjuncts are integrated into the discourse model at the same time; this also implies that the first conjunct must be integrated into the discourse model before the second one is processed, so we cannot use syntactic constraints to explain the contrasts in (27), (28), or (30), pace Kehler (1993).

Another problem for Kehler is sentences (28b′, b″) which differ from (28b) only with an intensive *himself*. The insertion of *himself* should not change the parallel nature of the sentence, so according to Kehler, the elided VP must be the exact copy of the first VP. He would predict a binding condition C violation, though sentences (28b′, b″) are not ungrammatical. The grammaticality of (28b′, b″) can be easily explained if the reconstructed VP is interpreted in the discourse model, i.e. the first conjunct has already been integrated into the discourse model. As Baker (1995) shows, the head noun that the intensive *himself* is attached to must be the central role or character in the plot (discourse). In the situation specified by (28b′), the central character is *Bill*, thus, *he* should refer to it because of the intensive *himself*.

Thus sentences like (28b′) and (33) suggest that the distinction between parallel and non-parallel constructions is not the right factor to explain the contrasts exemplified in (27), (28), or (30). It is the discourse and semantic factors, e.g. the discourse function of *too*, that play a crucial role in (27), (28), and (30).

The contrast in (29) cannot be explained simply with the discourse model. The two basic readings of the pronouns in question must be recognized to explain the contrast. Pronouns have both the bound variable and the referential uses; the bound variable use corresponds to the sloppy reading in VP-ellipsis. The strange reading in (29b) is the strict reading. The strangeness of (29b) can be explained as

follows: in the first conjunct only the bound variable reading is possible because of the reflexives in question which can have the bound variable use only, but the elided VP is interpreted as strict, i.e. the second conjunct is forced to be the referential reading. However, *too* only allows one semantic difference which is already been realized by the contrasted subjects. Since the two conjuncts are interpreted differently, as shown below, a second difference exists.

(35) a. λx[x defended x](John') (sloppy reading)
b. λx[x defended John](Bob') (strict reading)

(35a) shows the bound variable interpretation for the reflexive *himself*, whereas (35b) is a referential interpretation of the reflexive for sentence (29b). In other words, (35a) is the sloppy reading for the second clause in (29b), and (35b), the strict reading. Since there are two semantic differences between (35a) and (35b): *John* vs. *Bob*, and *x defended x* vs. *x defended John*. Hence, (29b) violates the one difference constraint of *too*. Note that (29b) is strange but not ungrammatical because pragmatics and the discourse in question are biased towards the intended reading, so the sentence is understandable, though not obeying the constraint of *too*.

Also note that the Chinese counterparts allow the strict reading for the second conjunct because Chinese reflexive *ta-ziji* can be interpreted referentially, as pointed out earlier. Hence there will be only one difference in the Chinese case, namely the subject.

Sentences like (27) and (30) can be explained similarly by the semantic and discourse constraints of *too*.

Therefore, it is the semantic and discourse factors but not the parallel vs. non-parallel distinction that constrain the contrasts, as exemplified by sentences in (27–31). It is not the pure syntactic identity that is involved in VP-ellipsis.

To summarize, I have shown that Kehler's parallel vs non-parallel distinction is not correct and there are alternative ways to explain the contrasts, as discussed above. The contrasts in (27–31) are better explained in the discourse model (deep anaphora), following Sag and Hankamer, after recognizing the special properties of pronouns and reflexives in both English and Chinese.

5. Conclusion

This paper has discussed the issues related to VP-Ellipsis and null object constructions in Mandarin Chinese. Pace Li (1998) and Xu (2003), but in line with Huang (1988a, b, 1991), I have argued that it is not true that no null object construction (NOC) sentences can be analyzed as VP-ellipsis in Mandarin Chinese, namely that some NOC sentences have to be interpreted as VP-ellipsis, and others need to

be interpreted as an empty pronoun, depending on whether the V-to-Asp^0 raising occurs or not. I have shown that the fact that the interpretation patterns of the relevant sentences deviate from those of their English counterparts is not because there is no VP-ellipsis in Chinese but because Chinese pronouns and reflexives exhibit some special properties different from those in English. The different behaviour of Chinese sentences from their English counterparts is due to the special properties of Chinese pronouns and reflexives. I have also argued that the parallel vs. non-parallel distinction, as discussed in Kehler (1993), is not adequate to account for the VP-ellipsis sentences in English. The involved level must be the discourse model, not just the pure syntactic identity in syntax, as suggested in the literature. Hence, the coordination construction in neither English nor Chinese is constrained by the so-called syntactic condition which is based on the parallel vs. non-parallel distinction, as proposed in Kehler (1993), and discourse factors play a crucial role in the interpretation of coordination construction in the two languages concerned.

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CHAPTER 11

The acquisition of nominal structure, word order and referentiality in Chinese

Corpus and experimental findings on the numeral phrase

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The mapping between nominal structure, word order and referentiality in Mandarin Chinese is examined from an acquisition perspective. Two aspects of the syntax-semantics interface are investigated based on early naturalistic data and experiments with preschool children: the Subject Specificity Constraint, which prohibits non-specific individual-denoting numeral phrases in subject position, and the referential difference between two types of noun phrases containing a modifier: inner modifier nominals (IMN) and outer modifier nominals (OWN) . Our findings reveal adult-like distribution of nominal types and an early sensitivity to the Subject Specificity Constraint. Given the poverty of the stimulus, the semantic difference between the two types of modified nominals, reflected in interactions with stress and focus, appears to be a late acquired interface property in child grammar.

In acquiring a language, children need to correctly interpret nominals: they have to develop knowledge of how referentiality is expressed in their target language, in particular, how semantic distinctions in specificity and definiteness are mapped to the internal structure of the nominals, and in the order of constituents in the clause and within the nominal itself.

The constraints on the mapping between nominal structure and word order on the one hand, and referentiality on the other, are complex. For example, bare nouns in Mandarin Chinese are interpreted as definite or generic in subject position, but may receive definite, specific, non-specific and generic interpretations in postverbal position in the sentence. On the other hand, nominals of the form 'demonstrative-classifier-noun' are generally understood as only having definite reference, irrespective of their syntactic position. Children will also need to become

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aware of restrictions on the syntactic distribution of certain types of nominals. For example, in Mandarin Chinese, nominals of the form 'classifier-noun' are banned from the subject position. Similarly, indefinite numeral phrases are generally disallowed in subject position (Chen 1987; Cheng and Sybsema 1999).

The question as to when children become sensitive to these complex mappings between the form and distribution of nominals and their referential meanings has been studied in detail with regard to the acquisition of the definite vs. indefinite distinction in languages such as English and French. In the study of English-speaking children, some scholars have reported preschoolers' knowledge of the mapping between indefinite and definite articles and referential notions such as specificity and definiteness (Brown 1973; Maratsos 1974, 1976; Emslie and Stevenson 1981), while others have reported non-adult patterns in the use of articles as late as seven years of age (Warden 1976, 1981). In studies of French-speaking children, the experiments of Karmiloff-Smith (1979, 1985) have demonstrated that children below six years of age experience difficulty in finding the appropriate nominal forms to encode new referents, while other researchers have shown earlier grasp of the use of indefinite NPs to introduce referents (De Cat 2013). In spite of the fact that findings based on different methodologies sometimes conflict, a number of patterns underlying children's use of nominal forms converge. First, children before four years of age are well aware of the use of indefinite forms for non-specific reference (Brown 1973; Maratsos 1974; Schafer and de Villiers 2000). Secondly, young children show correct use of definite NP forms for referents that have been introduced into discourse; their main nominal errors arise from the overuse of definite forms to signal referent introduction, a robust pattern found in comprehension as well as production experiments (van Hout, Harrigan and de Villiers 2010). Thirdly, children's behavior may vary depending on the experimental task, so that the provision of a visual context may induce overuse of definite NPs more than a context in which referents are only referred to verbally (Schafer and de Villiers 2010); similarly, whether a singleton set or a plural set of objects is presented would affect how well children choose the appropriate nominal form to introduce referents (Karmiloff-Smith 1979; Wexler 2011). If one takes the numeral phrase in Chinese as a major form for encoding new referents, on a par with indefinite NPs in English, it would be interesting to see whether children make similar referential errors in the use of numeral phrases.

In this paper, we focus on two phenomena related to numeral phrases in Mandarin Chinese from the acquisition perspective: (a) First, we will clarify the nature of the so-called Subject Specificity Constraint, in particular the types of numeral phrases that fail to occur in subject position; and (b) Second, we examine the specificity difference between what has been called inner modifier nominals (IMN) and outer modifier nominals (OMN), each instantiating a different positioning of

the prenominal modifier. The two phenomena are complex and have been subject to different analyses in the literature. The Subject Specificity Constraint says that a sentence with a numeral phrase subject, such as (1), is ungrammatical, though in some contexts such sentences sound quite natural, and corpus data reveal authentic uses of numeral phrase subjects. The distinction between IMN and OMN, as illustrated by the meaning difference between the sentences in (2) and (3), is said to be one of specificity. Scholars (notably Zhang 2006) argue that nominals like *dai yanjing de san ge tongxue* (OMN) in (3), with the modifier in outer position preceding the numeral-classifier, are specific but not definite, whereas nominals like *san ge dai yanjing de tongxue* (IMN), with the modifier in inner position following the numeral-classifier, as in (2), can be specific or non-specific.[1]

(1) ??*Yi ge tongxue dao le.*
one CL classmate arrive ASP
'A classmate has arrived.'

(2) *San ge dai yanjing de tongxue*
three CL wear glasses NOM classmate
'(The) three classmates who are wearing glasses'

(3) *Dai yanjing de san ge tongxue*
wear glasses DE three CL classmate
'(The) three classmates who are wearing glasses'

The following working definitions of definiteness and specificity are adopted. A nominal is definite if the speaker using it presupposes that the referent of the nominal can be identified by the hearer. The presupposition can be made based on mutual knowledge of the real world or context, or on prior discourse context (Hawkins 1978; Heim 1982; Givón 1984; Allan 1986; Avrutin 1994). A nominal is indefinite if no such presupposition is made by the speaker. An indefinite nominal may be specific or non-specific. An indefinite nominal is specific if the existence of the referents denoted by the nominal in the speaker's universe of discourse can be presupposed. Typically if the referent is a subset of a group of entities mentioned in prior discourse, the use of the nominal will be seen as specific (i.e. partitive use). An indefinite nominal is non-specific if the existence of the referents denoted

1. In this paper, the following abbreviations are used:

ASP	aspect marker	N	noun
CL	classifier	NOM	nominalizer
COMP	complementizer	Num	numeral
EMP	emphatic use of *jiu*	SFP	sentence final particle.

by the nominal in the speaker's universe of discourse is not presupposed. If the referent is introduced into discourse for the first time, the use of the nominal will be considered as non-specific (Kartunnen 1976; Enç 1991).[2]

Our paper will be divided into three parts. In the first part, we will examine the extent to which the Subject Specificity Constraint holds, as well as the semantic difference between IMN and OMN. In the second part of the paper, we will report corpus findings on the use of nominals by children and adults, in particular various types of numeral phrase, including IMN and OMN, with respect to their form, distribution and referential meanings. In the third part of our paper, we present experimental investigations on children's understanding of the IMN vs. OMN distinction. We conclude by highlighting the pattern of children's understanding of referentiality in Chinese based on our empirical findings.

1. The Subject Specificity Constraint in Chinese: An alternative view

Indefiniteness in Chinese is typically expressed by numeral phrases, structures of the form 'numeral-classifier-noun'. A well-known constraint on the mapping between referentiality and word order in Chinese is the prohibition of non-specific indefinite nominals from the subject position of a sentence (Ding et al. 1961; Chao 1968; Li and Thompson 1981; Zhu 1982), as shown in (1). Thus, a sentence such as (1) in which the subject nominal introduces a referent is generally considered to be ill-formed. The constraint has been analyzed from different perspectives in terms of information structure (Xu 1997), as well as in terms of logical representations (Cheng 1991), with the constraint linked to topic prominence (Lee 1986), the lack of tense in the language (Huang 2004), the peculiarity of numeral phrases and problems of existential closure (Tsai 1994, 2001), the syntactic distinction between NumP vs. DP (Li 1998), and the expression of thetic vs. categorical judgment (Kuroda 1972; Shyu 1995; Lu and Pan 2009).

Previous literature has identified the environments in which the constraint can be relaxed (Fan 1985; Lee 1986; Huang 1987; Li 1998; Tsai 2001; Huang 2004). Generally, numeral phrases can occur in subject position if they appear in embedded contexts such as a sentential subject or a conditional clause, or if they are licensed by

2. There are other views on the specific vs. non-specific distinction that make use of pragmatic notions such as "having a particular entity or a particular delimited set of entities in mind", or "having wide scope", as an indication of specific use (e.g. Fodor 1970; Ioup 1977; Fodor and Sag 1982; Hurford and Heasley 1983; Cormack and Kempson 1991; Diesing 1992; von Heusinger 2008). We will make occasional use of these notions in our analysis if they can be linked to our working definitions of specificity.

a modal operator. In all these contexts, the numeral phrases are non-referential in that they do not denote individuals, but rather denote quantities (analyzed as NumP by Li (1998)), or genericity. These contexts are illustrated in (4–7).

(4) *San ge ren chi fan duo hao.*
three CL person eat rice very good
'How good it is for three people to have a meal.'

(5) *Ruguo liang ge jiaoshou quexi hui jiu kai bu-cheng.*
if two CL professor absent meeting then hold not-attain
'If two professors are absent, then the meeting can't be held.'

(6) *Wu ge ren zhun neng wancheng renwu.*
five CL person surely can complete mission
'(A total of) five people can surely complete the mission.'

(7) *Yi ge congmingren yinggai shuo zhenhua.*
one CL intellectual should speak truth
'An intellectual should speak the truth.'

We have further established other environments for the occurrence of numeral phrases in subject position based on our own corpus studies (Lee and Wu 2011, 2012). In particular, individual-denoting numeral phrases can occur in subject position for definite reference, evidenced abundantly in our corpus data, as illustrated in (8–9), in which a subject numeral phrase (*liang ge ren* 'two persons') denotes individuals already introduced in prior discourse. The fact that numeral phrases can denote definiteness may be linked to the fact that Chinese is a pro-drop language, allowing for empty categories not only in argument positions but also in specifier positions. In view of this distributional fact, which supports the earlier observation of Chen (1987), the claim that the surface form of a numeral phrase is mapped by default to an indefinite reading, assumed in some analyses (Cheng and Sybesma 1999), would need to be modified.

(8) (Data from a play)[3]
Husi daxiao, you ning le Cuixi yixia, Cuixi jiao yi sheng,
Husi laugh, then pinch ASP Cuixi ASP, Cuixi yell one CL,
'Husi roars with laughter and pinches Cuixi so that she cries out,'
liang ge ren dui-xiao qilai.
two CL person each-other-laugh ASP
'then the two of them laugh together.'

3. The lines were taken from *Richu* ('Sunrise'), a major work of modern drama by the playwright Cao Yu, whose writings are considered exemplars of Modern Standard Chinese.

(9) (Data from Mary Erbaugh's Pear Stories corpus M07: Erbaugh 2001)
Ranhou, guo-lai zai chuxian de... shi yi ge ren qian-zhe yang
then, over-here again appear NOM... be one CL man lead ASP goat
zou guoqu.
walk past
'Then, what shows up next is a man who passes by with a goat.'
Liang ge ren mei jianghua.
two CL person not talk
'The two persons don't talk to each other.'

Our corpus findings show that the prohibition against non-specific indefinites in subject position is a strong one. At the same time, non-specific individual-denoting numeral phrases can occur in subject position to introduce referents only under certain conditions, namely, when there are accompanying spatial and temporal adverbials which contribute to the anchoring of the event in time and space, as in (10).[4] Non-specific subject nominals can also occur in veridictive contexts (Barwise 1981; Higginbotham 1983) in the context of a verb of perception such as *kan* 'look/see' or *ting* 'hear', which may be overt or covert (as in 11–12). The licensing contexts for non-specific numeral subjects are also evidenced in other corpus studies (Zhang 2009).

(10) (Data from a news report) (Fan 1985)
Bayue jiuri lingchen ershixu, yi chang
August 9th early-morning 2am-about, one CL
leidian-xiezhe-baoyu, dapo le Beijing-cheng yekong de ningjing.
thunder-with-rainstorm, break ASP Beijing-city night NOM quiet
'On the early morning of August 9th, around 2am, a thunder with rainstorm broke the quiet of a Beijing night.'

(11) (Data from a novel)[5]
Wo kandao ji ge shuxi de nannü tongxue shou-li
I see several CL familiar NOM male-female classmate hand-in
nazhe gaozhi zou shang tai qu, dui Su Yu jinxing
hold-ASP writing-paper walk on stage to, to Su Yu do
yizhengyanci de pipan.
stern NOM condemnation
'I saw that several classmates I knew well, each clutching a sheet of writing paper, strode onto the stage and delivered stern condemnations of Su Yu's crime.'

4. The fact that non-specific individual-denoting nominals can occur in subject position in the presence of spatio-temporal locatives in Chinese confirms the analysis of Huang (2004), who links the Subject Specificity Constraint to the need for anchoring of events in a language without tense.

5. The example was taken from the novel *Zai xiyu zhong huhan* ('Weeping in the rain'), a major work of Yu Hua, a prominent contemporary Chinese writer.

(12) (Data from a scene description in a play)[6]
You-bian men kai, yi wei toufa banbai de lao furen
Right-side door open, one CL hair grey NOM old woman
zhanweiweide zou jinlai.
trembling walk in
'The door on the right side opens. An old lady with grizzled hair totters in.'

2. The mapping of specificity to word order within the numeral phrase: Inner Modifier Nominal (IMN) vs. Outer Modifier Nominal (OMN)

A second constraint on the mapping between referentiality and word order in Chinese relates to the order of prenominal modifiers within a nominal. As mentioned earlier, the nominal with the prenominal modifier following the numeral-classifier, called the Inner Modifier Nominal (IMN), can be understood as specific or non-specific, while the nominal with the prenominal modifier preceding the numeral-classifier, called the Outer Modifier Nominal (OMN), can only be understood as specific (Huang 1982; Tsai 1994; Lu 1998; Del Gobbo 2003; Zhang 2006; Ming and Chen 2010). Previous scholars have observed that while an individual-denoting IMN can occur in an existential construction (13a), an individual-denoting OMN is incompatible with such a context (13b). It has also been claimed that while an OMN can occupy the subject position (14b), an IMN subject is not acceptable (14a). It has further been argued that the OMN is specific but not definite (Zhang 2006).[7]

(13) a. *You san ge bo-le pi de xiangjiao zai zhuo-shang.*
exist three CL peel-ASP skin NOM banana at table-on
'There are three peeled bananas on the table.' (IMN)
b. **You bo-le pi de san ge xiangjiao zai zhuo-shang.*
exist peel-ASP skin NOM three CL banana at table-on
*'There are (the) three peeled bananas on the table.' (OMN)

(14) a. ??*San ge bo-le pi de xiangjiao bujian le.* (IMN)
three CL peel-ASP skin NOM banana disappear ASP
'Three peeled bananas have disappeared.'
b. *Bo-le pi de san ge xiangjiao bujian le.* (OMN)
peel-ASP skin NOM three CL banana disappear ASP
'(The) three peeled bananas have disappeared.'

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6. The example was taken from *Leiyu* ('Thunderstorm'), a well-known play of Cao Yu.

7. In a recent paper (Zhang 2015), the claim that outer modifier nominals (OMNs) are specific but not definite seems to have been retracted. As will be seen, OMNs can clearly be understood as definite.

We wish to propose a somewhat different view of the IMN vs. OMN distinction based on our analysis of the Subject Specificity Constraint. Given the distribution of unmodified numeral phrases, one would expect IMNs to be able to occur in subject position in accordance with the conditions stated earlier, that is, if the individual-denoting IMN is licensed by spatio-temporal locatives or if it is in a veridictive context, or if it signals definite reference. Further, not only can OMN be specific, but it can also be definite. Thus IMN and OMN are similar in that both can be specific or definite. The main difference between them with respect to referentiality is that while IMN can be non-specific, OMN cannot.

The predictions are borne out by our analysis of numeral phrases based on two exemplary contemporary Chinese novels (Lee and Wu 2012).[8] It was found that in actual use the IMNs in subject position used for referent introduction were unexceptionally licensed by a spatio-temporal locative phrase or a veridictive context. An example is given in (15), in which the inner modified numeral phrase in subject position (*yi ge mosheng de nanren* 'a man I did not recognize') follows a spatial locative (*zai chaoshi de jingse li* 'in the damp landscape'). IMN may also be used to refer to prior-mentioned individuals, as in (16), with the numeral phrase in subject position referring to two individuals who have been introduced into discourse (*liang ge dadao le mudi de chengnianren* 'the two grown-ups who have achieved their goal'). It comes as no surprise that OMNs are used for definite reference, as in (17), in which the outer modified nominal (*zuozai cheshang de liang ge chengli haizi* 'the two city kids who are sitting on the bicycle') designates individuals who have been identified.[9]

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8. The data for analysis were drawn from two novels by major contemporary Chinese writers: *Zai xiyu zhong huhan* ('Weeping in the rain') by Yu Hua and *Kan shangqu hen mei* ('It looks beautiful') by Wang Shuo.

9. Examples of OMNs used for referent introduction were also found in the fictional narratives, illustrated by the subject phrase *cunli de yi ge haizi* 'a village boy' in (i). Without exception, the modifiers in these tokens are nominals. Such a use of OMN, which on the surface runs counter to the specificity of the nominal, seems to be peculiar to written language. Furthermore, the sequence 'DP-de-Numeral-Classifier-Modifier-Noun' is no different from 'DP-Numeral-Classifier-Noun', in which the DP can be understood as a frame-setting topic, in accordance with our analysis of the licensing environment for subject numeral phrases.

(i) *Yinggai shi gengzao yixie shihou, cun-li de yi ge haizi cong*
should be earlier a-little time, village-in NOM one CL child from
yuanchu zou guo-lai.
distance walk over-here
'It must have been a little earlier that a village boy had come tramping over from a spot far off in the distance.'

(15) *Wo zuozai wu-hou de chitang-pang, zai chaoshi de jingse-li,*
I sit-at house-back NOM poolside, in wet NOM landscape-in
yi ge mosheng de nanren xiang wo zou lai.
one CL unfamiliar NOM man to me walk over
'I was sitting by the pond behind the house, and in the damp landscape a man I did not recognize walked toward me.'

(16) *Zhang Qinghai he ling yi wei xing Lin de nü laoshi*
Zhang Qinghai and another one CL surname Lin NOM female teacher
kaishi le dui wo de shenwen… Liang ge dadao le mudi
begin ASP toward me NOM interrogation. two CL attain ASP goal
de chengnianren zongsuan, shu le yikouqi, ranhou
NOM adult finally, release ASP one-breath-air, then
jingpilixiede kao zai yizi shang.
exhausted rest at chair on
'Zhang Qinghai and a woman teacher named Lin began to question me… The two grown-ups who have achieved their goal could finally relax, and rested on the chair exhausted.'

(17) *Yisheng dai-zhe ta de liang ge erzi, qi-shang le tianjian*
doctor load-ASP his NOM two CL son ride to ASP between-fields
xiaolu, zuo-zai zuo-zai che-shang de liang ge chengli haizi
path, sit-on sit-on bicycle NOM two CL city child
fachu le jidongrenxin de hanjiao.
emit ASP exciting NOM shriek
'The doctor loaded his two sons onto the bicycle and rode off along a path between the fields. The two city kids who were sitting on the bicycle shrieked with excitement.'

3. Numeral phrases used by Mandarin-speaking children and adults

The seminal study of Hickmann and Liang (1990), based on an elicited production task involving picture narratives, has given some evidence that Mandarin-speaking five- and six-year-olds do not behave like adults in that they use preverbal numeral phrases to introduce referents, seemingly violating the Subject Specificity Constraint of Chinese. It is argued that young children do not fully acquire the basic information structure of Chinese until seven years of age or after, namely, the knowledge that new referents should be encoded in postverbal noun phrases, and preverbal nominals should signal elements that have entered the discourse.[10] This finding is

10. Since Hickmann and Liang (1990) reports the use of various NP forms separately from the use of preverbal and postverbal NPs, for first and subsequent mentions, one cannot deduce from

later confirmed in Min (1994), a longitudinal study of five Mandarin-speaking children growing up in Beijing, which records examples of indefinite NP subjects used by three-year-olds.[11] The apparent violation of the Subject Specificity Constraint is further documented in the recent elicited production study of Wu, Huang and Zhang (2015) based on picture narratives, with 60% or more of the referent introducing numeral phrases occurring in preverbal position in the speech of the three- and four-year-olds.

As observed by Min (1994), even though Mandarin-speaking children have difficulty mapping nominal forms to preverbal vs. postverbal order in accordance with the referential status of the discourse entities, children nonetheless show considerable sensitivity with regard to other mappings of nominal form. For example, three-year-olds do not use numeral phrases to denote prior-mentioned referents; further, while children use numeral phrases and bare nouns predominantly for non-specific reference, they never use demonstrative-classifier-noun, possessive-noun, demonstrative pronouns, personal pronouns or null pronouns for non-specific reference. Knowledge of these mappings is also evidenced in the study of other Mandarin-speaking children (Lee 2010).

3.1 Numeral phrases in the naturalistic speech of two Mandarin children

In this section, we report an analysis of numeral phrases in the naturalistic production of two Mandarin-speaking children (ZTX and CY) from our Beijing Child Early Language Acquisition (BJCELA) corpus (Lee 2010, 2012; Yang 2006). Our longitudinal study is similar to Min (1994) in terms of the age ranges for observation, but differs from it in examining a greater range of noun phrases and referential meanings, with reference to definiteness as well as specificity.[12] The present study also goes beyond the earlier observations of Lee (2010) on the referential properties

their tables the precise number of numeral phrases in preverbal or postverbal position that are used for referent introduction, though the general point is made about young children's failure to map numeral phrases to syntactic position correctly, and some examples of errors are given to illustrate the point.

11. For example, Min (1994: 137) cites the use of sentences such as (ii) by her child subject Meng Meng, at the age of three years and five days:

(ii) *Houlai yi ge yi wei lao bobo lai le.*
later one CL one CL old man come ASP
'Later an old man came.'

12. The five subjects studied in Min (1994) varied in their periods of observation, with the most detailed longitudinal data coming from two of the subjects: Meng Meng, observed from 1;3 to 2;8 and from 3;0 to 3;5; and Dandan, observed from 1;3 to 1;11.

of early nominals in child Mandarin, such as the earlier onset of non-specific uses of numeral phrases than specific uses. The use of numeral phrases in the adult input to the two children is also analyzed for comparison. Details of the two subjects and the data sessions are given in Table 1. For both the children's naturalistic production and the child-directed adult speech, all the numeral phrase tokens were extracted and classified according to their linguistic form. Then the different types of numeral phrases were divided into categories according to the syntactic positions in which they occurred, as well as the types of referential or non-referential meanings expressed.

Table 1. Subject and data information[13]

Name of child	**ZTX**	**CY**
Gender	Male	Female
Observation period in the present study	0;11;18 – 2;05;17	2;00;13 – 2;05;00
Frequency of sampling	monthly before age two; semi-monthly after age two	monthly
Number of sessions for analysis	24	6

Only numeral phrases in argument positions were included in our analysis. The referential status of each nominal token was checked according to the following criteria. For a numeral phrase to be considered definite, it had to meet the following requirements: (i) The numeral phrase must have a unique referent (or a unique set of referents) in the situation of conversation; (ii) The referent of the numeral phrase must be familiar to both the speaker and the hearer. In other words its referent must be identifiable to the hearer; (iii) The numeral phrase must not convey new information to the hearer; and (iv) The referent of the numeral phrase must be within the current consciousness of the hearer. For instance, in (18) the numeral phrase *san ge xiao ya* 'three ducklings' meets all the four requirements above: it has a unique set of referents, as there is no other duckling except the three present in the discourse; its referents are identifiable to the hearer, because they have been introduced into the discourse earlier by the hearer; the numeral phrase itself does not convey any new information in this sentence; and its referents are within the consciousness of the hearer, because the two interlocutors have been talking about them in prior discourse.

13. Age is represented in the following format: y;mm;dd, standing for year, month and day.

(18) (CY at 2;02;09)[14]
INV: *Ranhou jiu dao zhe-er le.*
then then come here SFP
'Then we move over here.'
INV: *Zhe jiang shenme?*
this say what
'What does this tell us?'
INV: *Gangcai shuijiao de san ge xiao yazi dou gan shenme le?*
just-now sleep NOM three CL small duck all do what SFP
'What did (the) three ducklings who were sleeping just now do?'
CHI: *San ge xiao ya gai le xin fang.*
three CL small duck build ASP new house
'(The) three ducklings built a new house.'

For an indefinite numeral phrase to be considered specific, our working definition for specificity says that the existence of the referent of the nominal must be presupposed in the speaker's universe of discourse. This criterion can be said to be satisfied if the speaker has some referent in mind when using the numeral phrase. Thus, an indefinite numeral phrase used to refer to entities in events that have taken place is generally considered to be specific. However, for a numeral phrase used to denote entities in a forthcoming event, we must make sure there is really a particular referent that the speaker is using the nominal to refer to; if such a referent cannot be found, the nominal will be considered to be non-specific. For example, in (19), the child uses *yi ge dongwu* 'an animal' to refer to the animal that the artist in the story has drawn. Obviously the child has a particular animal in her mind when using the numeral phrase; therefore it is specific. However, in (20) the numeral phrase *ge lü de* 'a green one' is used by the child to refer to an entity in a forthcoming picture-drawing event, and there is no evidence that the child has a particular referent for it; thus we consider it non-specific. For a numeral phrase to be considered quantity-denoting, it must be used by the speaker to talk about quantity, rather than individuals. For example, in (21) *liang fen qian* 'two cents' and *san fen qian* 'three cents' are both used to describe the quantity of money, as evidenced by the presence of modals. For a numeral phrase to be considered generic, the speaker must use it to refer to a kind, rather than an individual.

14. In this paper, the following abbreviations are used for speakers in the child-adult conversations:

AUN	aunt	GMM	maternal grandmother
CHI	child	INV	investigator
FAT	father	MOT	mother.

(19) (CY at 2;03;20)
AUN: *Zhe shi shei ya?*
this be who SFP
'Who is this?'
CHI: *Na shi xiao huajia.*
that be small artist
'That is a small artist.'
CHI: *Hua le yi ge dongwu.*
draw ASP one CL animal
'(He) drew an animal.'

(20) (ZTX at 2;01;26)
FAT: *Shi zhuzi ma?*
be bamboo SFP
'Is it a bamboo?'
CHI: *Shi.*
be
'Yes, it is.'
FAT: *Ni jiu mei jian-guo zhuzi ni jiu shi shi?*
you even not see-ASP bamboo you then be be
'You have never seen a bamboo before. How can you say yes?'
CHI: *Hua ge lü de ba.*
draw CL green NOM SFP
'Please draw a green one.'

(21) (ZTX at 2;05;17)
FAT: *Na liang fen qian neng mai binggun ma?*
then two CL money can buy ice-cream SFP
'Then can you buy an ice-cream with two cents?'
FAT: *Em*?
CHI: *San fen qian neng mai binggun ma.*
three CL money can buy ice-cream SFP
'Three cents will be enough to buy an ice-cream.'
CHI: *Liang fen qian bu neng.*
two CL money not can
'Two cents are not enough.'

As revealed in Table 2 and Table 3, for ZTX the most productive form of numeral phrase was Numeral-Classifier, accounting for 46% of his numeral phrases (99 tokens). Other categories, including Numeral-Classifier-Noun and Classifier-Noun, were also common in ZTX's production, with the former constituting 30% (64 tokens) of the child's numeral phrases and the latter 12% (26 tokens). For CY, the most common forms of the numeral phrase were Classifier-Noun, Numeral-

Classifier-Noun and Numeral-Classifier, accounting for 34% (33 tokens), 32% (31 tokens) and 31% (30 tokens) of the child's numeral phrases respectively. Numeral phrases with inner modifiers (IMN) were rare in the child's production: one token of the form 'Numeral-Classifier-Modifier-Noun' was found in ZTX and two tokens in CY. The use of overt nouns for IMN structures was favored: no Numeral-Classifier-Modifier phrases (IMNs with the noun being covert) were found in the productions of the two children. As for Classifier-Modifier phrases, ZTX produced four tokens in the observational period, and CY none. No numeral phrases with outer modifiers were found in the utterances of the two children.

Next, we examine the distribution of the numeral phrases and their referential properties.

Numeral-Classifier

Table 2 shows that the majority of the Numeral-Classifier tokens occurred in object position, typically with non-specific reference or quantity-denoting, as in (22) and (23) respectively. A very small percentage of Numeral-Classifier tokens (7% for both children) occurred in subject or topic position, with 7 tokens used by ZTX and 2 tokens by CY. These were exclusively definite nominals, as in (24) and (25). Details of the referential properties of the subject numeral phrases used by the two children are given in Table 4.

(22) (CY at 2;00;13)
MOT: *Mama jiao ni.*
Mom teach you
'Let me teach you.'
CHI: *Hua de sheme?*
draw NOM what
'What did you draw?'
CHI: *Mama kan zhe ge.*
Mom look this CL
'Mom, look at this!'
CHI: *Jisunjing na yi ge.*
Jisunjing take one CL
'Take one, Jisunjing.'

(23) (ZTX at 2;04;05)
CHI: *Kan wo.*
look me
'Look at me.'
CHI: *Wo san ge.*
I three CL
'I have three.'

(CHI takes the pink one from his father)
CHI: *Ni you liang ge.*
you have two CL
'You have two.'

(24) (ZTX at 2;04;15)
INV: *Hong che ye hui fan.*
red car also can turn-over
'(The) red car can also turn over.'
INV: *Ni kan hong che ye hui fan na.*
you see red car also can turn-over SFP
'You see, the red car can also turn over.'
CHI: *Liang ge dou shi gulu.*
two CL all be wheels
'Both are wheels.'

(25) (CY at 2;05;00)
CHI: *Liang ge ni de.*
two CL you NOM
'Both are yours.'
(CY gives the investigator two rings)
CHI: *Liang ge shi ni de.*
two CL be you NOM
'(Those) two are yours.'
(The investigator puts the two rings on her arm)
INV: Em.
'Yes.'
CHI: *Si ge shi wo de.*
four CL be I NOM
'(These) four are mine.'

Numeral-Classifier-Noun

Like the Numeral-Classifier tokens, the Numeral-Classifier-Noun phrase typically occurred in object position. As shown in Table 2: 78% of the Numeral-Classifier-Noun phrases used by ZTX were objects (50 tokens), with only 22% found in subject position (14 tokens). As for CY, Numeral-Classifier-Noun tokens occurring in object position formed 71% of the tokens (22 tokens), while subject tokens accounted for 29% (9 tokens), as shown in Table 3. Table 4 shows that with respect to subject numeral phrases of this form, 71% of the tokens (10 tokens) were used by ZTX for definite reference and 29% of them (4 tokens) denoted quantity; the corresponding figures for the Numeral-Classifier-Noun phrases used in subject position by CY were 78% (7 tokens) and 22% (2 tokens) respectively. The object numeral phrase tokens were typically non-specific, as in (26).

Table 2. Numeral phrases in the production of ZTX (Number of tokens)**

Age	Num		Num-CL			Num-CL-N			Num-CL-Modifier-(N)			CL-N	CL-Modifier	Total
	Subj	Obj	Subj	Topic	Obj	Subj	Topic	Obj	Subj	Topic	Obj	Obj	Obj	
1;08:24	0	0	0	0	2	0	0	0	0	0	0	1	0	3
1;09:22	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1;10:20	1	0	0	0	1	0	0	7	0	0	0	0	0	9
1;11;17	0	1	0	0	3	1	0	6	0	0	0	12	0	23
2:00;01	3	0	0	1	0	0	0	0	0	1	0	0	0	12
2;00;15	0	2	1	0	0	1	0	2	0	0	0	0	0	6
2;00;29	0	0	0	0	10	0	0	1	0	0	0	1	1	13
2;01;12	0	0	0	0	0	0	0	1	0	0	0	0	0	1
2;01;26	0	0	0	0	3	0	0	0	0	0	0	5	2	10
2;02;09	0	1	0	0	1	0	0	1	0	0	0	3	0	6
2;02;23	0	0	0	0	2	1	0	2	0	0	0	3	0	8
2;03;08	0	0	0	2	23	6	0	4	0	0	0	0	0	35
2;03;22	0	1	0	0	8	0	0	6	0	0	0	0	0	15
2;04;05	0	1	0	0	27	0	0	8	0	0	0	1	0	37
2;04;15	0	0	1	0	2	0	0	5	0	0	0	0	0	8
2;05;03	0	0	1	2	5	2	0	1	0	0	0	0	1	12
2;05:17	0	3	0	0	4	3	0	6	0	0	0	0	0	16
Sub-total	4	16	3	4	92	14	0	50	0	0	1	26	4	214
Total	**20**		**99**			**64**			**1**			**26**	**4**	

** In this and other tables, the following abbreviations are used: Num = Numeral; CL=Classifier; Subj=Subject; Obj=Object.

Table 3. Numeral phrases in the production of CY (Number of tokens)

Age	Num		Num-CL			Num-CL-N			Num-CL-Modifier-(N)			CL-N	CL-Modifier	Total
	Subj	Obj	Subj	Topic	Obj	Subj	Topic	Obj	Subj	Topic	Obj	Obj	Obj	
2;00;13	0	0	0	0	7	0	0	1	0	0	0	17	0	25
2;01:10	0	0	0	0	5	0	0	5	0	0	0	1	0	11
2;0;09	0	0	0	0	5	4	0	11	0	0	0	7	0	27
2;03;20	0	0	0	0	0	5	0	3	0	0	2	1	0	11
2;04;21	0	0	0	0	1	0	0	0	0	0	0	2	0	3
2;04;31	0	0	2	0	10	0	0	2	0	0	0	5	0	19
Sub-total	0	0	2	0	28	9	0	22	0	0	2	33	0	96
Total	**0**		**30**			**31**			**1**			**33**	**0**	

Table 4. The referentiality of subject numeral phrases in child speech (Number of tokens)

	Num	Num-CL					Num-CL-N						Total
	Definite	Definite	Specific	Non-specific	Quantity	Universal quantification	Definite	Specific	Non-specific	Quantity	Generic	Universal quantification	
ZTX	0	3	0	0	0	0	10	0	0	4	0	0	17
CY	0	2	0	0	0	0	7	0	0	2	0	0	11

(26) (ZTX at 2;05;17)
MOT: *Erzi.*
son
'Son.'
MOT: *Ni wan jimu ne?*
you play building-blocks SFP
'You are playing building blocks?'
MOT: *Ni jiao meimei he ni yiqi wan haoma?*
you ask sister with you together play ok
'Can you invite sister to play together with you?'
CHI: *Gai yi ge fangzi.*
build one CL house
'Build a house.'

A close examination of the Numeral-Classifier-Noun tokens in subject position shows that they either occurred in story-telling contexts signaling definite reference, with referents being presented in picture books, as in (27), or were quantity-denoting, as in (28). This pattern of referentiality is clearly evidenced in Table 4.

(27) (CY at 2;02;09)
INV: *Zhe feiji zenme le?*
this plane what's-wrong SFP
'What's wrong with this plane?'
CHI: *Feiji mei you weiba.*
plane not have tail
'(The) plane has no tail.'
INV: *Zhe bu shi weiba ma?*
this not be tail SFP
'Isn't this (the) tail?'
CHI: *San zhi xiaozhu ai gai xin fang.*
three CL piglet love build new house
'(The) three piglets are fond of building new houses.'

(28) (ZTX at 2;03;08)
FAT: *Wu kuai qian yinggai mai shi ge.*
five CL money should buy ten CL
'Five dollars should be enough to buy ten.'
FAT: *Zhidao le ma?*
know ASP SFP
'Got it?'
CHI: *Wu kuai qian ying.*
five CL money should
'Five dollars can.'

CHI: *Wu kuai qian yinggai mai liu ge.*
five CL money should buy six CL
'Five dollars should be enough to buy six.'

Inner modifier nominal (IMN)

Numeral phrases with inner modifiers were only found in object position, as shown in Tables 2 and 3. An example is given in (29).

(29) (ZTX at 2;00;01)
FAT: *Zheng xiang shuijiao.*
just want sleep
'(He is) about to go to sleep.'
FAT: *En.*
FAT: *Ranhou ne?*
then SFP
'And then?'
CHI: *Kandao yi ge lüyouyou de dongxi.*
see one CL green NOM thing
'(He) saw a green thing.'

Classifier-Noun

Classifier-Noun phrases were only found in object position, and never in subject position, a pattern evident from Tables 2 and 3. Their use is exemplified by (30).

(30) (CY at 2;00;13)
MOT:*Lai gei wo zhe bimao kou-shang.*
come for me this pen-cap put-on
'Put on the pen-cap for me, please.'
CHI: *Bimao kou-bu-shang.*
pen-cap put-not-on
'(I) couldn't put (the) pen-cap on.'s
CHI: *Xie zi.*
write character
'Write.'
CHI: *Mama hua ge pingguo.*
mom draw CL apple
'Mom, please draw an apple.'

3.2 Numeral phrases in child-directed adult speech

Examining the nominals used by adults in the same dataset as that for children's speech, we found altogether 949 tokens of numeral phrases in ZTX's adult input, and 347 in CY's, as shown in Table 5. Among these tokens, the vast majority did not contain any modifiers, in either inner or outer position in the nominal. For ZTX, 64% (606 tokens) of the numeral phrases in child-directed adult speech were of the form 'Numeral-Classifier', such as *liang ge* 'two CL'; 21% (202 tokens) were of the form 'Numeral-Classifier-Noun', for example *san zhi xiaozhu* 'three CL piglets'; 12% (110 tokens) were Classifier-Noun phrases like *ge pingguo* 'CL apple'; and only two bare numeral phrases were attested, such as *liang* 'two'. Similarly, in CY's adult input 56% of the numeral phrases (196 tokens) were Numeral-Classifier phrases, 27% (93 tokens) were Numeral-Classifier-Noun phrases, and 15% (51 tokens) were of the Classifier-Noun structure. There were no numeral-only phrases in CY's adult input.

Numeral phrases with modifiers, whether inner modifiers or outer modifiers, were far less productive than numeral phrases without modifiers in the adult input for the two children. With regard to inner modifier nominals (IMN), ZTX's input recorded 24 tokens of Numeral-Classifier-Modifier-(Noun) phrases, constituting only 3% of the total number of numeral phrases in the adult input, and five tokens of Classifier-Modifier structures (less than 1%). Similarly, IMNs were only rarely used in the adult input to CY, with only six tokens of the form Numeral-Classifier-Modifier-(Noun). Outer modifier nominals (OMN) were virtually non-existent in child-directed speech. Only one token was found in the adult input to CY, and none in ZTX's input data.

Numeral-Classifier

The overwhelming majority of Numeral-Classifier nominals occurred in object position: for ZTX, 98% (586 tokens) of nominals of this form appeared in object position, and for CY 99% (194 tokens), almost exclusively with non-specific reading, as shown in Table 5. Examples are given in (31) and (32). Only a negligible proportion of Numeral-Classifier tokens was found in the subject position (2% in ZTX, with 19 tokens attested, and 1% in CY, with 2 tokens recorded). These were subject numeral phrases containing an appositive nominal which can be analyzed as a DP in specifier position, as in (33). These nominals signaled definite reference, as shown in Table 6.

(31) (Adult input to ZTX at 0;11;18)
MOT: *Yeye* *ne*?
grandpa SFP
'Where is grandpa?'

INV: *Yeye zai limian ne.*
grandpa at inside SFP
'Grandpa is inside'
MOT: *Yeye zai limian chang xi ne.*
grandpa at inside sing opera SFP
'Grandpa is singing opera inside'
MOT: *Ni ye chang yi ge.*
you too sing one CL
'You (should) also sing one.'

(32) (Adult input to CY at 2;05;00)
CHI: *Wo ye yiyang.*
I too the-same
'I also (do) the same'
(CY is imitating the investigator and putting rings on her left arm again)
INV: *Zai zhe zhi shou-shang ye tao shang.*
at this CL hand-on too put-on on
'Put (one) on this hand too.'
INV: *Cheng Yi yi zhi shou-shang tao yi ge.*
Cheng Yi one CL hand-on put-on one CL
'CY put one on each hand.'
INV: *Yi ge gebo-shang tao yi ge.*
one CL arm-on put-on one CL
'Put one on each arm.'

(33) (Adult input to ZTX at 1;00;16)
MOT: *Zhe ge women ren bu cuo.*
this CL we recognize not wrong
'We will not make mistakes in recognizing this.'
(Mother is pointing at pictures of fruits and vegetables for CY to name)
MOT: *Women suiran bu renshi pingguo.*
we although not recognize apple
'Although we cannot recognize apples.'
MOT: *Danshi women zhidao na bu shi.*
but we know that not be
'We know that is not (an apple).'
FAT: *Xihongshi he caomei liang ge tai xiang.*
tomato and strawberry two CL too similar
'(The) two, (a) tomato and (a) strawberry, look very much alike.'

Table 5. Numeral phrases in child-directed adult speech (Number of tokens)

	Num		Num-CL			Num-CL-N			Num-CL-modifier-(N)			Modifier-num-CL-(N)		CL-N	CL-modifier	Total
	Subj	Obj	Subj	Topic	Obj	Subj	Topic	Obj	Subj	Topic	Obj	Subj	Obj	Obj	Obj	
Adult input to ZTX	2	0	19	1	586	5	0	197	0	0	24	0	0	110	5	949
Adult input to CY	0	0	2	0	194	9	0	84	0	0	6	1	0	51	0	347

Table 6. The referentiality of subject numeral phrases in child-directed adult speech (Number of tokens)

	Num	Num-CL					Num-CL-N						OMN						Total
	Definite	Definite	Specific	Non-specific	Quantity	Universal quantification	Definite	Specific	Non-specific	Quantity	Generic	Universal quantification	Definite	Specific	Non-specific	Quantity	Generic	Universal quantification	
Adult input to ZTX	2	19	0	0	0	0	3	0	0	2	0	0	0	0	0	0	0	0	26
Adult input to CY	0	2	0	0	0	0	4	0	0	2	2	1	0	1	0	0	0	0	12

Numeral-Classifier-Noun

With regard to Numeral-Classifier-Noun tokens in the input data to the children (Table 5), the vast majority of them were also found in object position; 98% (197 tokens) of these nominals were used as objects in the input for ZTX, and 90% (84 tokens) of them appeared as objects for CY, typically with non-specific reference, as illustrated in (34). In contrast, subject Numeral-Classifier-Noun tokens were much less frequent; only 2% (5 tokens) of nominals of this structure occurred in the input to ZTX and 10% (9 tokens) in the input to CY. As can be seen from Table 6, which gives the referential meanings of the subject numeral phrases, it seems that these forms were mainly used to denote definite reference or quantity, illustrated in (35) and (36), with some tokens signaling generic reference or universal quantification, exemplified by (37) and (38) respectively. The definite use of the Numeral-Classifier-Noun form in subject position was typically observed in a book narration context, often accompanied by pointing or an attention-getter like "look!" (39).

(34) (Adult input to ZTX at 1;00;16)
MOT: *Shangbian dai yan-er de zhe shi caomei.*
on have hole NOM this be strawberry
'Those with holes on it are strawberries.'
MOT: *Mama bu shi shuo-guo le ma?*
mom not be say-ASP ASP SFP
'Mom said this before, didn't she?'
FAT: *Shuo dui le.*
say right SFP
'(If) you say it right.'
FAT: *Wo jiu jiang ni yi ge xihongshi.*
I then reward you one CL tomato
'I will reward you with a tomato.'

(35) (Adult input to CY at 2;01;10)
CHI: *Shei zuo-zai che-shang a?*
who sit-at car-on SFP
'Who is sitting in the car?'
(CY is pointing at a body-weight scale on which there are two figures)
INV: *Zhe shi shei ya?*
this be who SFP
'Who are these (people)?'
INV: *Zhe shi yi ge nan de he yi ge nü de.*
this be one CL male NOM and one CL female NOM
'They are a man and a woman.'
INV: *Liang ge ren zuo-zai che-shang, shi ba?*
two CL person sit-at car-on, be SFP
'The two of them are sitting in the car, right?'

(36) (Adult input to ZTX at 2;05;17)
CHI: *Gei wo wushi.*
give me fifty
'Give me fifty (dollars).'
FAT: *Gei ni duoshao?*
give you how-much
'How much (shall) I give you?'
CHI: *Gei wo wushi.*
give me fifty
'Give me fifty (dollars).'
INV: *Wushi kuai qian neng mai de liao binggun ma?*
fifty dollar money can buy COMP attain ice-cream SFP
'Is fifty dollars enough to buy an ice-cream?'

(37) (Adult input to ZTX at 1;07;21)
MOT: *Wang hou zuo dian.*
to back sit a-little
'Sit back a little.'
MOT: *Hao.*
good
'Okay.'
MOT: *Zuo hao le a.*
sit well ASP SFP
'Sit tight.'
(ZTX recites a children's song)
MOT: *Yi zhi qingwa.*
one CL frog
'A frog'
CHI: *Si tiao tui.*
four CL leg
'(has) four legs.'

(38) (Adult input to CY at 2;00;13)
MOT: *Jiu shi zheyang da de kapian, zheme da.*
EMP be this big NOM card, this big
'They are cards as big as this.'
(Mother is talking about the word and picture cards the child is fond of viewing)
CHI: *Kapian-er.*
card
'Card.'
MOT: *Yi zhang kapian yi ge dongxi.*
one CL card one CL thing
'(There is) one thing on each card.'

(39) (Adult input to ZTX at 2;02;09)
MOT: *Ni kan.*
you look
'Look!'
MOT: *Yi ge da xiongmao bao zhe yi ge xiao xiongmao.*
one CL big panda hug-ASP one CL small panda
'A big panda is hugging a small panda.'

Inner modifier nominal (IMN)

As can be seen from Table 5, in child-directed speech, phrases with inner modifiers (IMN) were found only in object position, in story-telling contexts, as in (40–41). The use of IMN in subject position was not attested.

(40) (Adult input to ZTX at 2;00;15)
CHI: *Xiao tuzi.*
small bunny
'Bunny.'
INV: *Xiao tuzi zai gan ma ya?*
small bunny ASP do what SFP
'What's the bunny doing?'
CHI: Um.
'Um.'
INV: *Ta shuo xiao tuzi gai le yi jian piaoliang de fangzi.*
it say small bunny build ASP one CL beautiful NOM house
'It says that the bunny has built a beautiful house.'

(41) (Adult input to CY at 2;02;09)
CHI: *Wo jiang de bu dui.*
I say COMP not right
'I didn't say it right.'
GMM: *Ni jiang de bu dui a*?
you say COMP not right SFP
'You didn't say it right?'
GMM: *Senlin-li lai le yi ge dai jia yanjing de yangjingshe.*
forest-in come ASP one CL wear fake glasses NOM cobra
'A cobra that wears fake glasses came into the forest.'

Outer modifier nominal (OMN)

The only token of OMN in child-directed speech, attested in the adult input to CY, was a definite nominal, denoting individuals that have been introduced into the discourse earlier, as can be seen in (42).

(42) (Adult input to CY at 2;02;09)
INV: *Ranhou jiu dao zhe-er le.*
then then come here SFP
'Then we got here.'
INV: *Zhe jiang shenme?*
this say what
'What does this tell us?'
INV: *Gangcai shuijiao de san ge xiao yazi dou gan shenme le?*
just-now sleep NOM three CL duckling all do what SFP
'What did the three ducklings who were sleeping just now do?'

Classifier-Noun
Classifier-Noun phrases in the adult input were exclusively found in object position, usually with a non-specific reading, as in (43).

(43) (Adult input to ZTX at 1;01;26)
FAT: *Ni gei baba chi ge putao ba?*
you give father eat CL grape SFP
'Give me a grape to eat, ok?'
FAT: *Maomao.*
'Maomao.'
INV: *Gei baba.*
give father
'Give (a grape) to your father.'
FAT: *Gei baba chi ge putao ba?*
give father eat CL grape SFP
'Give father a grape to eat, OK? '

With reference to the distribution and specificity of the numeral phrases in the adult input, it can be observed that in general, numeral phrases, whatever their internal structure, are strongly inclined to occur in object position, typically signaling non-specific reference; subject numeral phrases tend to be used to denote definite reference or quantity.

3.3 Comparison of numeral phrases used in children and adults

The early use of numeral phrases by the two children was adult-like. The most productive forms were Numeral-Classifier, followed by Numeral-Classifier-Noun and Classifier-Noun. Similar to adults, children generally favored the object position for numeral phrases. The subject numeral phrases in the children's naturalistic production were exclusively definite or quantity-denoting. No non-specific

individual-denoting subject numeral phrases were found in the children's language, reflecting an early sensitivity to the Subject Specificity Constraint. This finding seems to be at odds with other studies that report uses of subject numeral phrases to introduce referents (Hickmann and Liang 1990; Min 1994; Hickmann and Hendricks 1999; Wu, Huang, and Zhang 2015). There may be two reasons for this discrepancy. First, various scholars have observed that children use numeral phrases initially for non-specific reference, often to denote quantity, before they use numeral phrases for specific reference. The lack of subject specificity errors may stem from the fact that numeral phrases begin to be used to introduce new referents after two years of age, as can be seen from the data reported in Min (1994) and Lee (2010). The referential inadequacy of the children may not be revealed if non-specific individual-denoting uses of numeral phrases are infrequent in the period of observation (cf. Example (28) above). Secondly, the findings on inappropriate uses of numeral phrases come from experimental studies which require children to introduce referents in a singleton or plural set. In contrast, in naturalistic child-adult interactions, the referents are often in clear view of both participants, and situations calling for introduction of new referents which the interlocutor is hitherto unaware of are probably rare. Children were also sensitive to the prohibition against Classifier-Noun nominals in subject position, using these structures only as objects.[15] Numeral phrases with inner modifiers (IMN) were sparse in children's naturalistic speech. Those with outer modifiers (OMN) were absent in child speech. The low incidence of both IMN and OMN in child language suggests that the mapping between the internal order of numeral phrase and specificity may be late in acquisition.

4. An experimental study on Mandarin-speaking children's comprehension of the IMN /OMN distinction

In what follows, we report experimental data on children's understanding of the semantic distinction between IMN and OMN. As observed earlier, while IMNs can be understood as definite, specific or non-specific, OMNs can only have definite or specific reference. It is the specificity distinction that concerns us in our experiments. Before we proceed to the experiments, we should take note of one more

15. As observed in Cheng and Sybesma (1999), noun phrases of the form 'Classifier-Noun', which can occur in object position, are prohibited from the subject position in Mandarin. The restriction can be seen as a consequence of the Subject Specificity Constraint if one assumes that the 'Classifier-Noun' nominal has a null numeral, so that the phrase can only receive a non-specific interpretation.

manifestation of the specificity distinction between IMN and OMN, having to do with stress and focus, which is relevant to our experimental design. With respect to focus, while the numeral in an IMN can be stressed and thus focused by a restrictive operator (44a), the numeral in an OMN cannot (44b), as noted earlier by Huang (1982: 62–5). This may have to do with the fact that if the numeral is focused, its interpretation will be a quantity reading, a non-referential reading which is incompatible with the specificity or definiteness of OMN. This semantic difference between OMN and IMN in their interactions with focus has given us a way of testing children's understanding of the IMN/OMN distinction in truth-conditional contexts.

(44) a. *Xiaohouzi zhi nazhe san ge bo-le pi de xiangjiao.*
little-monkey only hold-ASP three CL peel-ASP skin NOM banana
'The little monkey is holding only three peeled bananas (and nothing else).' (IMN)
'The little monkey is holding only three peeled bananas (not other quantities of peeled bananas).'

b. *Xiaohouzi zhi nazhe bo-le pi de san ge xiangjiao.*
little-monkey only hold-ASP peel-ASP skin NOM three CL banana
'The little monkey is holding only three peeled bananas (specific ones) (and nothing else).' (OMN)
*'The little monkey is holding only three peeled bananas (not other quantities of peeled bananas).'

4.1 Method

Test materials

To explore children's understanding of the referential differences between IMN and OMN, we used a picture verification task with four- to five-year-old Mandarin-speaking children ($N = 28$), as well as a control group of Mandarin-speaking adults ($N = 24$) in China. The experimental design made use of the difference between IMN and OMN in their interactions with restrictive focus, to create situations in which the two structures will yield a truth conditional difference. Three sentence types were tested, as shown in (45). Two of the test sentence types consisted of an inner modifier numeral phrase (IMN) in object position, differing in whether stress is placed on the numeral, making the quantity reading salient (Type A), or not (Type B), illustrated in (45a) and (45b) respectively. The remaining type of test sentences contained an outer modifier numeral phrase in object position, with the numeral unstressed (Type C), as in (45c). As will be seen, due to the ambiguity of IMN sentences with no stress on the numeral (Type B), one would need to bring

in IMN sentences with the numeral stressed (Type A) to ensure that a truth conditional difference between IMN and OMN will be manifested clearly.

(45) a. Type A (IMN, with numeral stressed)
Xiaohouzi zhi nazhe ***san*** *ge bo-le pi de xiangjiao.*
little-monkey only hold-ASP three CL peel-ASP skin NOM banana
'The little monkey is holding only three peeled bananas (not other quantities of peeled bananas).'
#'The little monkey is holding only three peeled bananas (and nothing else).'[16]

b. Type B (IMN, with no stress on the numeral)
Xiaohouzi zhi nazhe san ge bo-le pi de xiangjiao.
little-monkey only hold-ASP three CL peel-ASP skin NOM banana
'The little monkey is holding only three peeled bananas (not other quantities of peeled bananas).'
'The little monkey is holding only three peeled bananas (and nothing else).'

c. Type C (OMN, with no stress on the numeral)
Xiaohouzi zhi nazhe bo-le pi de san ge xiangjiao.
little-monkey only hold-ASP peel-ASP skin NOM three CL banana
'The little monkey is holding only the three peeled bananas (specific ones) (and nothing else).'

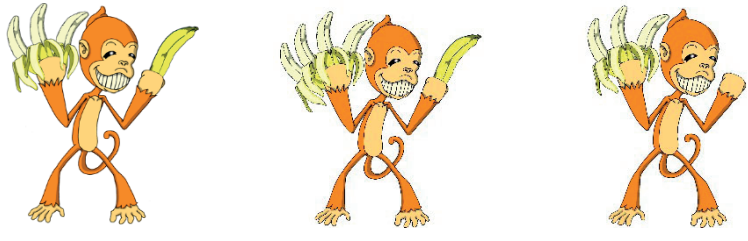

Figure 1. Test pictures for testing children's understanding of IMN/OMN

In the experimental design, Type A sentences are paired with situations depicted in pictures similar to Figure 1a and Figure 1b, in which some object other than the referents of the modified numeral phrase, which is of the same kind as the latter but possessing a different attribute, is present in both pictures (for example, an unpeeled

16. For sentence type A, with the numeral stressed, it would be pragmatically infelicitous (marked by '#') when used in a situation in which quantity is not focused, for example, a situation in which the little monkey is holding three peeled bananas in one hand, and nothing else in the other, as depicted in Figure 1c.

banana). The minimal difference between the pictures concerns the quantity of objects represented by the modified nominal, with the falsifying picture showing a quantity that exceeds that denoted by the numeral (for example, four instead of three peeled bananas). Type B sentences are paired with pictures analogous to Figure 1a and Figure 1c, in which the minimal difference between the pictures relates to whether some object other than the referents of the modified numeral phrase, which is of the same kind as the latter but possessing a different attribute, is present (for example, an unpeeled banana). Type C sentences are also paired with situations which differ minimally with regard to whether some other object than the referents of the modified numeral phrase is present (parallel to Figure 1a and Figure 1c).[17]

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17. It should be noted that the test sentence items for Sentence Type A (received by Group 1) differed from those for Sentence Type B (received by Group 2) not only in the presence of stress on the numeral in the former and the absence of it in the latter, but also in the referents involved in the test items. As an illustration, the test sentences for Type A received by Group 1 are given in (iiia-d) whereas those for Type B received by Group 2 are given in (iva-d).

(iii) (Type A, IMN, with numeral stressed)

a. *Xiaogou zhi tuo zhe san ge you huawen de xigua.*
puppy only pulling ASP three CL have stripe NOM watermelon
'The puppy is only pulling three watermelons which have stripes (on them).'

b. *Wugui zhi bei zhe liang zhi chuan zhe yifu de tuzi.*
turtle only carry-on-back ASP two CL wear ASP clothing NOM rabbit
'The turtle is carrying on its back only two rabbits who are wearing clothes.'

c. *Shujia shang zhi bai zhe liang ben fankai le de shu.*
bookcase on only put ASP two CL open ASP NOM book
'On the bookcase are (placed) only two opened books.'

d. *Caodi shang zhi you san ke zhang le pingguo de shu.*
lawn on only have three CL grow ASP apple NOM tree
'On the lawn are only three trees which have apples grown (on them).'

(iv) (Type B, IMN, with no stress on the numeral)

a. *Xiaonühai zhi qian zhe san zhi dai yanjing de xiaogou.*
girl only lead ASP three CL wear glasses NOM puppy
'The girl is only leading three puppies which are wearing glasses.'

b. *Xiao shizi zhi tuo zhe liang ge suo zhe de xiangzi.*
little lion only pull ASP two CL lock ASP NOM suitcase
'The little lion is only pulling two suitcases that are locked.'

c. *Qiang-shang zhi gua zhe liang fu hua zhe xiaoniao de hua.*
wall-on only hang ASP two CL draw ASP little-bird NOM picture
'On the wall only hangs two pictures that have little birds drawn (on them).'

d. *Zhuozi-shang zhi fang zhe san tai heise de dianhuaji.*
table-on only put ASP three CL black-color NOM telephone
'On the table are only (placed) three telephones that are black in color.'

The test sentence items for Sentence Type C (OMN), received by both Group 1 and Group 2, were the same for both groups.

To illustrate the logic of the experimental design, consider the interpretations of the IMN and OMN in (45) in connection with the pictures in Figure 1. For Type A sentences in which the numeral is stressed, adults were expected to accept a situation in which the monkey is holding three peeled bananas as well as one unpeeled banana, with the focus on the numeral (Figure 1a). At the same time, adults receiving a Type A sentence would reject a situation in which the monkey is holding more than three peeled bananas as well as an unpeeled banana (Figure 1b). For Type B sentences in which the numeral is not stressed, two possible interpretations can be envisaged. On one interpretation, the restrictive focus may associate with the entire object *san ge pole pi de xiangjiao* 'three peeled bananas', in which case the subject was expected to accept a situation in which the monkey is holding three peeled bananas and nothing else (Figure 1c), and at the same time reject a scenario in which the monkey is holding an unpeeled banana in addition to three peeled bananas (Figure 1a). On another interpretation, the restrictive focus may still associate with the numeral even if the latter is not stressed, in which case the scenario in Figure 1a would be found to be true of a Type B sentence, which would be rejected for the scenario in Figure 1c. In other words, subjects responding to a Type B sentence were expected to give a mixed response to both Figure 1a and Figure 1c. As for Type C sentences, since stress cannot be assigned to the numeral in an OMN structure, restrictive focus can only be associated with the object nominal. Thus, adults were expected to accept Figure 1c, but reject Figure 1a, as depictions of the meaning of Type C sentences. In our design, the critical situation distinguishing the IMN and OMN structures is that illustrated in Figure 1a. Subjects should accept Figure 1a for an IMN-with-stress sentence (Type A), accept it some of the time for an IMN-without-stress sentence (Type B) and reject it for an OMN sentence (Type C).[18]

Four test sentences were included for each of the three sentence types. For Type A and Type C sentences, each sentence was paired with an affirming situation and a falsifying situation; for Type B sentences, whose interpretation would depend on whether the hearer chose to assign focus to the numeral, each sentence was paired with an affirming situation and another situation which is potentially falsifying.

18. As can be seen, the falsifying picture for a Type C sentence (OMN) (Figure 1a) is also intended to be a falsifying picture for a Type B sentence (IMN, with no stress on the numeral), on the reading in which the restrictive focus marker *zhi* 'only' is associated with the entire numeral phrase. As discussed in Section 2, the IMN sentence differs from its OMN counterpart in being susceptible to a non-specific as well as a specific reading. In the context of the experimental design, however, since the referents relevant to the interpretation of the modified nominal are depicted in pictures, we were not able to investigate the non-specific reading of the IMN by observing its use in denoting individuals known to the speaker but not the hearer. Instead, the nonspecific property of IMN was examined indirectly through its compatibility with a quantity focus, a reading unavailable to OMN.

Altogether there were 24 core test sentences (3 sentence types x 4 tokens x 2 situations). For each sentence type, two of the four test tokens had agentive subjects and theme objects, while the other two had locative subjects and theme objects. A partial between-subjects design was used, with two partially overlapping sets of sentence types tested on two groups of subjects. Group 1, consisting of 14 children (mean age = 5;2) and 12 adults, received Type A and Type C sentences, while Group 2, composed of another 14 children (mean age = 5;1) and another 12 adults, received Type B and Type C sentences.[19] Each subject received 16 core test items (2 sentence types x 4 tokens x 2 situations) performed in two separate sessions. The test battery for each subject included 4 warm-up trials, the core test items, 8 items examining their understanding of *zhi* 'only', and 8 fillers. Excluding warm-up trials, each child received 16 trials in each of the two sessions, including 8 core test item trials, 4 items related to their understanding of *zhi* 'only', and 4 fillers.[20]

Procedure

The test sentences serving as stimuli were audio-recorded. Each child subject was tested individually in a kindergarten in Shenzhen. The experimenter invited the child subject to view some pictures together with a toy prop (Giraffe the Puppet). The subject was told that Giraffe the puppet was going to say an utterance describing what he had seen in the picture. As Giraffe was not smart enough, he could make errors in his descriptions occasionally. Therefore the child subject was asked to tell Giraffe the Puppet whether the latter was correct or not. If what Giraffe said was not correct, the subject should also tell him why. As the child viewed the picture, the recorded test sentence would be played through a hidden loudspeaker. The experimenter interacted with the child subject and gave instructions to him/her, while an assistant operated the Giraffe and the audio-recorder. The two sessions for each child lasted around 30 minutes. The adults, all university students who were native speakers of Mandarin, participated in the experiment in a group, and viewed the test pictures displayed on PowerPoint slides projected on a screen. When a test picture was displayed, a recorded test item was played through the loudspeaker. The subjects were required to judge whether the test item correctly described the content of the picture, and to write down their answers on an answer sheet. For those items they judged to be incorrect, they were asked to justify their judgments.

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19. A total of 30 children were tested in the experiment, two of whom were excluded from analysis as they did not distinguish sentences with the restrictive focus marker *zhi* 'only' and corresponding sentences without the marker.

20. The test also included 16 additional items involving sentences with topicalized orders, which are not included in the current report.

4.2 Results

As a control, the experiment included items that tested subjects' understanding of the restrictive focus marker *zhi* 'only', which would be a necessary pre-requisite for their interpretation of the interaction between the focus marker and the modified numeral phrase. Sentences such as (46) were presented to the child and adult subjects; half of them contained the restrictive focus marker *zhi* 'only' (46b), while the other half did not (46a). The test pictures for these sentences always portrayed the referent of the nominal associated with the focus marker (for example, an umbrella or a clock), as well as another object serving either as a patient acted on by an agentive participant or a theme positioned relative to a location. The subjects were expected to accept the picture for the sentences without *zhi* 'only' (46a), and reject it for the sentences containing the focus marker (46b).[21]

(46) a. *Xiaotou na zhe yusan.*
burglar carry ASP umbrella
'(The) burglar is carrying (an) umbrella.'
b. *Qiang-shang zhi gua zhe zhong.*
wall-on only hang ASP clock
'On (the) wall only hangs (a) clock.'

Our findings show that all of the adult subjects consistently rejected the sentences containing *zhi* 'only', in accordance with our predictions, as can be seen from Figure 2. Furthermore, even in the absence of the operator, 87.5% of the adults consistently rejected the sentences without *zhi* 'only', reflecting their strong adherence to the Gricean quantity maxim: they would reject a sentence describing the state of a relevant object when the scenario also includes another potentially relevant object in the foreground.[22] On the other hand, 93% of the children consistently rejected the sentence with *zhi* 'only' on a falsifying situation, and a much smaller percentage of the group rejected the sentence without *zhi* 'only', reflecting a basic grasp of the meaning of the focus operator.

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21. As explained in Section 4.1, a group of 14 children and 12 adults received the Type A sentences, and another group of 14 children and 12 adults received the Type B sentences; both groups participated in the Type C sentence items.

22. A paired-sample t-test conducted on the overall rejection rates between the subjects' responses on the two types of sentences (sentences with and without the restrictive operator) revealed a significant difference for the adults ($t = -3.114$, $p < 0.01$), and for the children ($t = -9.175$, $p < 0.001$).

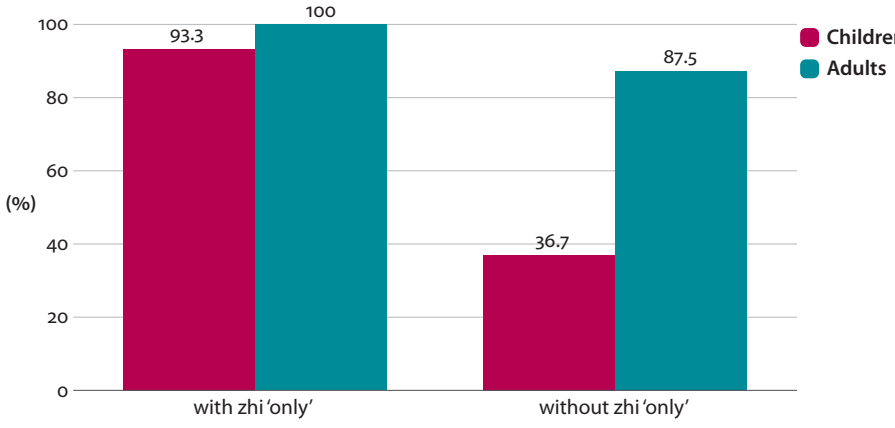

Figure 2. Percentage of children ($N = 28$) and adults ($N = 24$) who rejected sentences with restrictive focus marker *zhi* 'only' and sentences without restrictive focus marker *zhi* 'only' on three or more of four trials

Next, we examine the adults' acceptance patterns regarding the Type A, Type B and Type C sentences involving IMN with stress, IMN with no stress and OMN sentences. Figure 3 shows that adults differentiated IMN and OMN sharply, with 100% of them consistently rejecting Type C (OMN) sentences in the critical situation, which falsifies the sentence (i.e. one showing an extra object with a different attribute, such as that depicted in Figure 1a). In contrast, only a low percentage of adults (8.3%) consistently rejected Type A for the same situation, since for an IMN with the numeral stressed and focused, the number of objects bearing the relevant attribute confirms the quantity denoted by the numeral, despite the fact that an extra object with a different attribute is present. Thus one should expect a high percentage of acceptances and a low percentage of rejections of the sentence when matched with the critical situation. This is borne out by the data. As explained earlier, Type B sentences are potentially ambiguous, depending on whether the restrictive focus marker applies to the numeral or the entire nominal. For the same critical situation with an extra object (Figure 1a), if *zhi* 'only' is associated with the numeral, then the sentence is true; if the focus marker applies to the entire nominal, the sentence will be false for the same reason that OMN sentences are false. This prediction is confirmed, as around 58.3% of adults subjects consistently rejected Type B sentences, pointing to the potential for such sentences to be subject to different interpretations.[23]

23. A paired-sample t-test conducted on the overall rejection rates between the adults' responses on Type A and Type C sentences revealed a significant difference ($t = -9.574$, $p < 0.001$); a marginally significant difference in overall rejection rates was found in the adults' responses on Type B and Type C sentences ($t = -2.916$, $p < 0.015$).

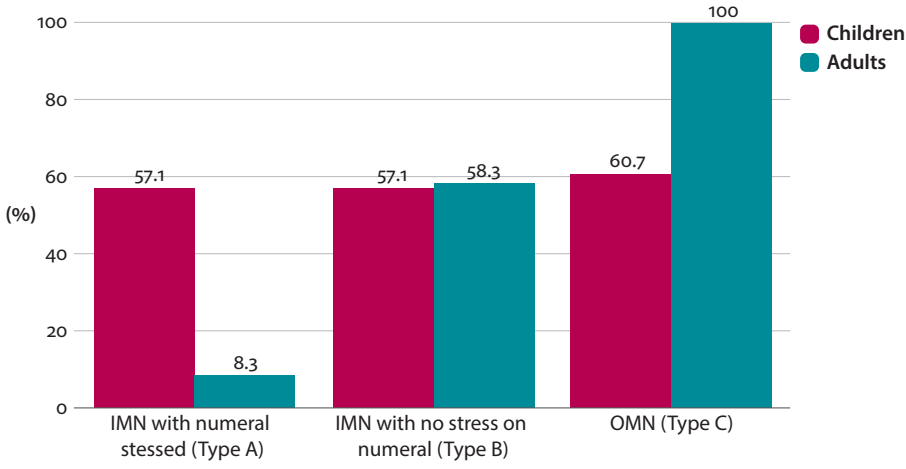

Figure 3. Percentage of children and adults who rejected IMN in sentences with numeral stressed, IMN sentences with no stress on the numeral, and OMN sentences, on three or more of the four trials in critical situations

A sharp contrast can be observed between the responses of the children and adults. Around 57% of the children consistently rejected the Type A sentences in the relevant critical situation (i.e. Figure 1a), at a level similar to their rejection of Type C (OMN) sentences (60.7%), revealing a lack of sensitivity to the semantic implications of the syntactic difference between IMN and OMN. The fact that children did not differentiate between the Type A and Type B sentences, with the latter being rejected also at a rate of around 57%, possibly reflects a lack of knowledge of how stress relates to focus, as well as a poor grasp of the distinction between IMN and OMN in terms of referentiality.

Our experimental findings clearly point to a lack of sensitivity to the IMN/OMN distinction, and delayed mastery of properties on the syntax-semantics interface in language development. The overall results indicate that interface properties that involve the mapping between nominal structure, word order and referentiality will take some years for children to acquire, probably because while the complex interactions between word order and specificity will be constrained by Universal Grammar, they also involve language-specific properties which need to be learned on the basis of impoverished positive evidence, for instance differences stemming from the positioning of the modifier within the nominal, as reflected in our findings on adult input to children.

5. Conclusions

In this paper, we have investigated the mapping between nominal structure, word order and referentiality from the perspective of language acquisition, using early naturalistic child Mandarin data and experiments with preschool Mandarin-speaking children. We have argued that the Subject Specificity Constraint is one that prohibits non-specific individual-denoting numeral phrases, but does not exclude numeral phrases used for definite reference. We have also argued that contrary to earlier studies, both Inner Modifier Nominals (IMN) and Outer Modifier Nominals (OMN) can be definite; their difference lies in the fact that while IMN can be specific or non-specific, OMN cannot be non-specific. These characterizations are fully supported by both corpus data drawn from contemporary and modern literary works and the adult input to our child subjects.

Our detailed analysis of the early language of two Beijing children indicates that Mandarin-speaking children are sensitive to the Subject Specificity Constraint from the very earliest stage of grammatical development, using numeral phrases primarily in object position for both specific and non-specific reference, and using them in subject position only for definite reference or for denoting quantity. This finding is at odds with earlier reports of violations of the Subject Specificity Constraint, which may reflect differences between the referential demands commonly found in naturalistic interaction and those due to experimental tasks (Hickman and Liang 1990; Hickmann and Hendricks 1999; Wu, Huang, and Zhang 2015). Children are aware that structures such as Classifier-Noun cannot appear in subject position, and restrict them to postverbal position.

Mandarin-speaking children produce inner modified numeral phrases (IMN), in which the modifier occurs between the classifier and the modified noun, sparsely, and do not use outer modified numeral phrases (OMN), in which the modifier occurs before the classifier, in their naturalistic speech. While IMNs appear to some extent in the adult input to the children, OMNs are virtually absent. Thus the distinction between IMN and OMN is not visibly present in the positive evidence available to Mandarin-speaking children, leading us to hypothesize that this subtle semantic distinction may be a late acquisition. Our experimental study of the difference between IMN and OMN, as reflected in their distinct interactions with stress and focus, has confirmed the late development of this interface property in child grammar.

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CHAPTER 12

Syntax/semantics interface and interpretation of Chinese NP_1NP_2V construction by Japanese speakers

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Sorace's (2005, 2006) Interface Hypothesis proposed that properties of syntax are relatively easier to acquire than ones involving interfaces. The article provides supporting evidence with a study investigating second language (L2) acquisition of the interpretation of Chinese NP_1NP_2V construction by Japanese speakers. The canonical OSV interpretation for Chinese NP_1NP_2V is considered a syntactic property. The acceptability of SOV interpretation for Chinese NP_1NP_2V depends on the combined effects of the semantic compatibility factor and the prominence factor, which involve the syntax-semantics interface. The results show that Japanese speakers can acquire the canonical OSV interpretation; but they have difficulties in accessing prominence to distinguish the acceptable SOV interpretation from the unacceptable one.

1. Introduction

Recently, second language (L2) studies from the generative approach have shifted to focus on interfaces, which provide a new perspective in L2 research to seek possible causes of divergence between L2 grammars and target grammars (White 2009, 2011).

Two influential hypotheses on interfaces in L2 studies have been proposed by Sorace and colleagues, namely, Interface Hypothesis Version 1 and Interface Hypothesis Version 2, as so called in White (2011). On Sorace's (2005, 2006) Version 1 of the Interface Hypothesis, interface properties, which integrate different aspects of grammar, are more likely to result in an incomplete acquisition than pure syntactic properties. On Tsimpli and Sorace's (2006) Version 2 of the Interface Hypothesis, not all interface phenomena are problematic for L2 learners, nevertheless. The internal interfaces where different components of grammar interact with one another are easier to acquire compared with the external interfaces where grammar relates to other cognitive domains. It is interesting to note that the two

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versions of the Interface Hypothesis seem to make different claims on the acquisition outcome concerning the internal interfaces, for example, the syntax-semantics interface. According to Version 1, the syntax-semantics interface leads to difficulties. However, according to Version 2, it might be expected to be unproblematic.

Researchers studying L2 acquisition have not reached an agreement as to whether the syntax-semantics interface properties are problematic or not. Some researchers (e.g. Dekydtspotter & Hathorn, 2005; White 2008; White, Belikova, Hagstrom, Kpisch & Özcelik 2012) showed that native-like grammars could be obtained at the interface between syntax and semantics, even though such (unconscious) subtle knowledge was not easily available in L2 input and even in cases where the L1 and L2 differ in the relevant aspect of grammar. In contrast, other researchers (e.g. Guijarro-Fuentes & Marinis 2007; Yuan 2010) demonstrated that the L2 learners were successful only in some but not all of the conditions concerning the same construction at the syntax-semantics interface, which suggests that not all the grammatical properties interfacing syntax and semantics and not even within the same construction involving syntax and semantics can result in the same or similar acquisition outcome.

The present paper reports a study to provide further evidence for the on-going discussion of the L2 acquisition of grammatical properties at the syntax-semantics interface. This study investigates the L2 acquisition of the interpretation of Chinese NP_1NP_2V construction by Japanese-speaking learners of Chinese. The paper is organized as follows. First, we provide a descriptive summary of the syntactic and semantic properties of the NP_1NP_2V construction, in particular, how grammatical functions and semantic roles are assigned to the two NPs involved. We then review some major previous studies concerning L2 acquisition of Chinese NP_1NP_2V in Section 3. Section 4 presents the empirical study. In Section 5, we have a discussion of the two versions of the Interface Hypothesis on the basis of the results obtained in the empirical study, and in Section 6 we provide the conclusions.

2. Theoretical accounts on the agent role assignment in Chinese and Japanese NP_1NP_2V

In certain aspects of Chinese grammar, prominence and locality conditions play a key role in regulating sentence interpretation. This has been shown in studies on anaphoric resolution of Chinese reflexive *ziji*, for example, Pan (1997) and Hu and Pan (2002). According to these studies, Chinese *ziji* always searches for antecedents by starting with the closest compatible NP, and then other compatible NPs in the order of closeness to *ziji*. This is known as the locality condition. Besides, the NPs to be selected as antecedents must be prominent in terms of grammatical, semantic and pragmatic functions.

The interpretation of Chinese NP_1NP_2V construction provides another example. Chinese is a language without overt case marking, as opposed to other languages with rich overt grammatical markers, for example, Japanese. The question concerning which of the two NPs of NP_1NP_2V assumes the semantic role of agent and syntactically functions as subject is much trickier with Chinese than with Japanese. In the latter, the agent or the subject can be easily read off the sentence as indicated by the nominative case marker. Lacking overt case marking as a clue in Chinese, the assignment of the agent role of the verb to either NP_1 or NP_2 in NP_1NP_2V is subject to a combination of factors such as the relative closeness of the two NPs to the verb, semantic meaning and prominence (Hu 2010). By default, NP_2, which is closer than NP_1 to the verb on the construction, gets assigned the agent role, as long as it is semantically compatible with the agent role of the verb. This preference for NP_2 to be interpreted as the agent or the subject of the NP_1NP_2V construction, is commonly known as the second-noun strategy in literature (e.g. Bates & MacWhinney 1981; Sasaki 1994; Kilborn & Ito 1989), characterizing a number of languages including English and Chinese. In other words, OSV is the canonical word order of Chinese NP_1NP_2V.

On the other hand, if NP_2 fails to be semantically compatible with the agent role of the verb, NP_1 can potentially assume the agent role or the subject function so long as it meets certain conditions. According to a recent proposal (Hu 2010), NP_1 must first be semantically compatible with the agent role of the verb; second, it must be more prominent compared with NP_2. The prominence of an NP can be determined by its position along a number of proposed prominence hierarchies which include those shown in (1). Thus, in accordance with the animacy prominence hierarchy in (1a), an NP denoting a human is more prominent than an NP denoting a nonhuman animate entity, and an NP denoting a nonhuman animate entity is more prominent than an NP denoting an inanimate entity. Likewise, in accordance with the reference prominence hierarchy in (1b), a definite common noun is more important than an indefinite specific or nonspecific common noun. The relative prominence of the two NPs in Chinese NP_1NP_2V is evaluated by taking into consideration the total prominence weights of one NP relative to those of the other NP along these prominence hierarchies. To illustrate, let us consider two NPs *yige xuesheng* (a student) and *naben shu* (the book). According to the animacy prominence hierarchy, *yige xuesheng* is more prominent than *naben shu*, but according to the reference prominence hierarchy, the latter being definite is more prominent than the former which is an indefinite NP. Thus the total prominence weights of the two NPs can be judged as equal. On the other hand, if we change the indefinite NP *yige xuesheng* to definite, that is, *nage xuesheng* (the student), then its prominence is higher than the aforementioned definite inanimate NP *naben shu.*

(1) Prominence Hierarchies
   a. Animacy: [+human] > [–human; +animate] > [+inanimate] > [+abstract]
   b. Reference: personal pronouns > proper nouns > [+definite] common nouns > [–definite; +specific] common nouns > [–specific] common nouns
   c. Person: 1, 2 > 3

With regard to Japanese (Hu 2010: 8), a characteristic SOV language, animacy and its canonical word order might have an influence on which of the two NPs assume the agent role of the verb in NP_1NP_2V, but overall Japanese primarily employs its morphological devices, that is, nominative case markers, to indicate the agent role of the verb in NP_1NP_2V (Sasaki 1994).

In contrast, the assignment of the agent role in NP_1NP_2V in Chinese involves both syntactic locality and semantic prominence factors as presented above and thus can be regarded as a syntax-semantics interface phenomenon.

3. Previous studies on L2 acquisition of Chinese NP_1NP_2V

The L2 acquisition of the interpretation of NP_1NP_2V has been examined within the framework of the Competition Model focusing on language processing (cf. Bates and MacWhinney 1989). On the Competition Model, the sentence's surface forms (such as morphological markers, word order and animacy) can serve as cues for the underlying functions of the sentence (e.g. agent and the sentence subject role). The cues' strengths combine (i.e. form a coalition) when they suggest the same interpretation, and if different cues are in conflict, the interpretation will be decided by the stronger cue which wins out in the competition with other cues. Take English NP_1NP_2V such as *the cow the grass is eating* as example. The animacy of the NPs hints that *the cow* is the subject. However, the canonical OSV word order for English NP_1NP_2V suggests that *the grass* is the subject. Because word order can override animacy in English language processing, *the grass* will win over *the cow* as the sentence subject.

With regard to L2 acquisition of the interpretation of Chinese NP_1NP_2V by English-speaking learners of Chinese in the Competition Model paradigm, Miao (1981) studied two types of cues. One was word order, varying at three levels: (1) NP_1NP_2V, (2) VNP_1NP_2 and (3) NP_1VNP_2. The other was animacy. The nouns were either animate (A) or inanimate (I), and the two nouns in the test sentences were presented in either the AA, AI, or IA sequences. Her participants included 8 English speakers who had studied Chinese over 3 years. The participants were asked to act out with toys "who did what to whom" after they listened to the test sentences. The results showed the English speakers did not exhibit a selection preference for NP_2 as the subject of Chinese NP_1NP_2V sentences, with the average selection rate of NP_2

at 27.8% (as cited in Kilborn & Ito 1989). This fairly low rate might indicate the absence of second-noun strategy in interpreting Chinese NP_1NP_2V sentences on the part of English speakers who had learned Chinese for several years. But since this was a collapsed selection rate of NP_2 for all the three AA, AI, IA sequences of NP_1NP_2V sentences, it was yet to be checked and to be explored in further studies whether English speakers would not give a markedly higher selection rate of NP_2 as the subject in the AA and IA sequences, for unlike the AI sequence, both the AA and IA sequences semantically render it plausible for NP_2 to serve as a subject.

Liu, Bates, and Li (1992) employed a similar set of test materials to examine patterns of transfer in the sentence processing strategies demonstrated by English-speaking learners of Chinese and Chinese-speaking learners of English. The experiment task was also similar to that of Miao (1981), except that the participants told their choices to the experimenter directly after listening to the test sentences. The participants included 8 English speakers exposing to L2 Chinese after age 20. As far as Chinese NP_1NP_2V was concerned, the English speakers did not demonstrate the second-noun strategy, for their selection rate of NP_2 as the agent was just around chance level in the AA sequence. Besides, the English speakers seemed to be subject to the effect of animacy, with the selection rates for NP_2 at around 95% in the IA sequence and only about 10% in the AI sequence.

The aforementioned L2 studies provided us with some expectations on L2 learners' processing patterns on Chinese NP_1NP_2V. However, both the studies addressed only two types of cues, i.e., canonical word order and animacy, leaving the effect of prominence unexamined. As we have seen in Hu's (2010) analysis, prominence plays a vital role in assigning the agent role of the verb to NP_1 in Chinese NP_1NP_2V. So the present study took the prominence factor into consideration in investigating L2 learners' interpretation of Chinese NP_1NP_2V, in addition to word order and animacy. Besides, the test sentences in the aforementioned two studies were generated randomly from a list of animate and inanimate nouns and transitive action verbs. There was no guarantee that all the test sentences used in their experiments were pragmatically felicitous Chinese sentences. To avoid this problem, the present study used the test sentences that are free from this potentially confounding factor.

4. Empirical study

4.1 Research questions

The present study investigated the interpretation of Chinese NP_1NP_2V by Japanese-speaking learners of Chinese. When it comes to the interpretation of NP_1NP_2V, Japanese differs from Chinese. While Chinese is canonically OSV as far as NP_1NP_2V is concerned, Japanese is SOV. Moreover, Japanese relies primarily on overt

morphological markers to indicate the agent role whereas Chinese has no such overt morphological markers and thus has to depend on an interaction of word order, animacy (semantic compatibility) and prominence to decide whether NP_1 carries the agent role in NP_1NP_2V, resulting in a SOV interpretation. Given the sharp differences between Japanese and Chinese with regard to the interpretation of NP_1NP_2V, an empirical study was conducted to investigate how Japanese speakers learning Chinese interpret Chinese NP_1NP_2V. The following questions were asked in the present study.

1. Can Japanese speakers switch from their L1's canonical SOV interpretation in NP_1NP_2V to Chinese canonical OSV interpretation?
2. Can Japanese speakers acquire the syntax-semantics interface properties regarding Chinese NP_1NP_2V by showing sensitivity to semantic factors (i.e., semantic compatibility, prominence) when considering the SOV interpretation?

According to Version 1 of the Interface Hypothesis, Japanese speakers would acquire Chinese canonical OSV interpretation while they might have difficulties in judging the SOV interpretation of Chinese NP_1NP_2V, for narrow syntax can be acquired whereas the interface properties are likely to be problematic for L2 learners. On the other hand, Version 2 of the Interface Hypothesis would incline us to predict that Japanese speakers can make a correct judgment on the SOV interpretation of Chinese NP_1NP_2V because it involves an internal interface, which is assumed to be unproblematic in L2 acquisition.

4.2 Methodology

4.2.1 *Participants*

Fifty-nine Japanese speakers learning Chinese and 17 Chinese controls participated in the study. At the time of testing, all the Japanese speakers were studying Chinese at universities in Shanghai. Forty-nine out of the total 59 Japanese speakers had participated in a standardized Chinese proficiency test (HSK), which assigns the people taking the test to 11 proficiency levels, ranging from Level 1 to Level 11.[1] The remaining ten participants reported that they had not participated in the HSK test, thus we had no information about their exact Chinese proficiency

1. The paper adopts the level scheme of the original version of HSK test. There were two versions of HSK tests being implemented at the time of data collection. The majority of our Japanese speakers took the original version and only very few took the revised one. The results from the revised version have been transcribed into the corresponding levels of the original version of HSK test in the report of the participants' information in this paper.

levels. The majority of the Japanese speakers (85%) aged between 18 and 29 while a small number of Japanese speakers aged 30 or above. All the Chinese controls aged between 18 and 29. The information about all the participants in the study is summarized in Table 1.

Table 1. Participants' details

	HSK levels	Number of participants	Average months of studying Chinese	Average months in China
L2 learners	4	3	24	24
	5	6	34	21
	6	13	30	27
	7	7	41	38
	8	13	50	39
	9	6	46	36
	10	1	24	60
	N/A	10	30	16
L1 controls	–	17	–	–

4.2.2 *Materials and procedure*

We developed two major types of Chinese NP_1NP_2V sentences to tap Japanese speakers' interpretation. In one major type, the two NPs are both animate and semantically compatible with the agent role of the verb (for convenience sake, we call this major type AA). And this AA type was further divided into 3 subtypes, illustrated by Types 1, 2 and 3 in Table 2. On Type1 (henceforth, the AA_PP type), the two NPs are equal in prominence. On Type2 (henceforth, the AA_HL type), the NP_1 is of higher prominence than the NP_2. On Type3 (henceforth, the AA_LH type), the NP_1 is of lower prominence than the NP_2.

Table 2. Test sentence AA types

Labels	Sequences			Examples		
Type1 AA_PP	A	A	V	*baigou* white dog	*heigou* black dog	*zhui-zhe* chase-PROG
Type2 AA_HL	*na*+A	*you*+A	V	*na-zhi-baigou* DEF-CLF-white dog	*you-zhi-heigou* INDF-CLF-black dog	*zhui-zhe* chase-PROG
Type3 AA_LH	*you*+A	*na*+A	V	*you-zhi-baigou* INDF-CLF-white dog	*na-zhi-heigou* DEF-CLF-black dog	*zhui-zhe* chase-PROG

AA = both NPs are animate
PP = NP_1 is as prominent as NP_2
HL = NP_1 is more prominent than NP_2
LH = NP_1 is less prominent than NP_2

In the other major type, only one of the two NPs is animate and semantically compatible with the agent role of the verb (we call this major type AI/IA). This AI/IA type was further divided into 4 subtypes, illustrated by Types 4, 5, 6 and 7 in Table 3. On Type4 (henceforth, the ?AI_PP type), the NP_1 is the only animate and semantically compatible NP with the verb; and the NP_1 is as prominent as the NP_2. On Type5 (henceforth, the IA_PP type), the NP_2 is the only animate and semantically compatible NP with the verb; and the NP_1 is as prominent as the NP_2. On Type6 (henceforth, the AI_HL type), the NP_1 is the only animate and semantically compatible NP with the verb; and the NP_1 is more prominent than the NP_2. On Type7 (henceforth, the IA_LH type), the NP_2 is the only animate and semantically compatible NP with the verb; and the NP_1 is less prominent than the NP_2.

Table 3. Test sentence AI/IA types

Labels	Sequences			Examples		
Type4 ?AI_PP	*you*+A	*na* + I	V	**you-ge-ren* INDF-CLF-person	*na-ben-shu* DEF-CLF-book	*mai-le* buy-PRF
Type5 IA_PP	*na*+I	*you* + A	V	*na-ben-shu* DEF-CLF-book	*you-ge-ren* INDF-CLF-person	*mai-le* buy-PRF
Type6 AI_HL	A	I	V	*xuesheng* student	*zuoye* assignment	*jiao-le* submit-PRF
Type7 IA_LH	I	A	V	*zuoye* assignment	*xuesheng* student	*jiao-le* submit-PRF

AI = NP_1 is animate and NP_2 inanimate
IA = NP_1 is inanimate and NP_2 animate
PP = NP_1 is as prominent as NP_2
HL = NP_1 is more prominent than NP_2
LH = NP_1 is less prominent than NP_2

To manipulate the prominence contrast between the two NPs in the sentence, we had two ways. In one way, we made use of the animacy of the NPs, since animate NPs are more prominent than inanimate ones, as exemplified in sentence types AI_HL and IA_LH in Table 3. In the other way, we added Chinese indefinite marker *you* and definite marker *na* to modify the nouns, since definite NPs are of higher prominence than indefinite ones, as shown in sentence types AA_HL and AA_LH in Table 2.

To render the two NPs of the sentence equal in prominence, we also had two ways. In one way, the NPs are both bare nouns and animate, as demonstrated in sentence type AA_PP in Table 2. In the other way, animate nouns go with indefinite marker *you* while inanimate ones co-occur with definite marker *na*; in such a way, the two NPs also equal in prominence, as shown in sentence types ?AI_PP and IA_PP in Table 3.

Each of the 7 sentence types had four tokens, resulting in a total of 28 test sentences. The Chinese characters in the test sentences were restricted to those that the learners had already learned in class. Prior to the actual test, we had conducted a pilot study with native Chinese to replace some sentences which they found unnatural. The finalized test sentences were randomized and put into actual tests with fillers.

Two experiment tasks were used to investigate the participants' interpretation. They were the agent selection task and the sentence acceptance task.

In the agent selection task, the learners were presented with NP_1NP_2V sentences of AA types in Table 2, followed by questions asking them to decide which NP in each test sentence is the doer of the action indicated by the verb. For all the three AA types (i.e., AA_PP, AA_HL and AA_LH), the NP_2s are animate and semantically compatible with the agent roles of the verbs, thus NP_2s are expected to be selected as agents. An example of the test item from the test paper is given in (2).[2]

(2) 白猫黑猫跟着。
white cat black cat is chasing
动作"跟"的发出者是: 白猫 黑猫
the doer of the action is: white cat black cat.

In the sentence judgment task, the learners were presented with AI/IA sentence types and then required to judge their acceptability on a 7 point Likert scale ranging from *definitely unacceptable* to *definitely acceptable*, as shown in (3).[3]

(3)

	完全 不可接受 *definitely unacceptable*						完全 可接受 *definitely acceptable*
牛奶宝宝喝了。 *milk baby drank*	1	2	3	4	5	6	7

The task was used to test the four AI/IA types listed in Table 3, where only one of the NPs in the sentence is semantically compatible with the agent role of the verb. In the task, the learners were not asked to select the doer of the action indicated by the verb, because they might easily succeed based on extra-grammatical knowledge. Instead, they were required to judge the acceptability of the four AI/IA types, which force either a SOV interpretation or an OSV interpretation depending on NP_1 or NP_2 being the only animate NP in the sentence.

2. In the actual test paper, the test item was presented in Chinese without English translation.

3. In the actual test paper, the test item was presented in Chinese without English translation.

The IA types (i.e., IA_PP and IA_LH), meet the requirement of interpreting Chinese NP_1NP_2V sentences as being of canonical OSV order, as the NP_2 is animate and semantically compatible with the agent role of the verb.

On the other hand, the AI types (i.e., ?AI_PP and AI_HL), with the only animate NP in NP_1 position, force the SOV interpretation for the NP_1NP_2V sentences whose acceptability depends on how prominent NP_1 is compared with NP_2. NP_1 need to be more prominent than NP_2 in order for the sentence to be acceptable. Thus AI_HL type is acceptable while ?AI_PP type is hardly acceptable.

The experiment was administered to the participants in groups. The instruction language was Chinese. The participants went through trials to ensure that they had clearly understood the instruction before doing the actual test. The agent selection task proceeded prior to the sentence judgment task. After the test, the participants finished a questionnaire on their language learning history.

4.3 Results

4.3.1 *Methods of data analysis*

On the agent selection task, the response of selecting NP_2 was given one point, and the response of selecting $NP_1$was given a zero point. For each test sentence type, the scores of the four tokens were added together and then divided by four to get the mean score for the type.

On the sentence judgment task, the response of selecting 1, 2, 3, 4, 5, 6, 7 on the scale was given 0, 1, 2, 3, 4, 5, 6 points respectively. That is, the higher the score, the more acceptable the sentence was to the participant. For each test sentence type, the scores of the four tokens were added together and then divided by four to get the mean score for the type.

Missing responses were excluded from the data analysis. The mean score for each sentence type is to be displayed in absolute number and in percentage rate in the report of the results.

We performed two kinds of analyses of the test data. We first analyzed the results by taking into consideration the participants' Chinese proficiency level factor. In this analysis, we only considered those participants (n = 49) who had taken the HSK test and reported the proficiency level they had obtained from the test. We classified those of Levels 4 to 6 into the low proficiency group, and those of Levels 8–10 into the high proficiency group, with the exclusion of seven learners at Level 7. Then we gave an analysis of the test data based on all the individual Japanese participants' (n = 59) performance regardless of their Chinese proficiency levels or whether or not they had taken the HSK test.

4.3.2 *Analysis in terms of proficiency groups*

Results on the agent selection task

Recall the agent selection task testing the AA sentence types, in which the NPs involved are both animate and are both semantically compatible with the agent role of the verb. These sentence types were used to find out which of the two NPs of NP_1NP_2V the participants would prefer as the agent of the verb or the subject. The higher the score the participants obtained in the task, the more likely they opted for Chinese-type OSV order, or in other words, the participants exhibited the second-noun strategy. By contrast, the lower the score the participants obtained, the more it indicates that they inclined for Japanese-type SOV order. Table 4 presents the participants' performance in the agent selection task.

Table 4. Mean scores (max. 4) of selecting NP_2 as agent in three AA sentence types per proficiency group

	AA_PP Mean (SD)	AA_HL Mean (SD)	AA_LH Mean (SD)
L1 controls	3.82 (0.39)	4.00 (0)	4.00 (0)
L2 high proficiency	2.00 (1.69)	2.30 (1.42)	2.35 (1.42)
L2 low proficiency	1.36 (1.62)	1.18 (1.26)	0.95 (1.43)

The L1 controls scored very high on AA_PP, AA_HL and AA_LH. The repeated measure ANOVA indicates that their performance was quite consistent across the three sentence types ($F(1, 16) = 3.43, p > 0.05$). These data suggest that the L1 controls opted for the canonical OSV order for Chinese NP_1NP_2V as expected. The L2 high proficiency group scored around chance level rather consistently across the three sentence types ($F(2, 38) = 0.85, p > 0.05$). The low proficiency group also performed consistently across the sentence types ($F(2, 42) = 2.06, p > 0.05$). They selected NP_2 as the agent of the verb at a low rate of around 30% (as shown in Figure 1), a sign of preference for their L1-like SOV order. One-way ANOVA tests conducted on all the 3 participant groups indicate a significant difference among the two learner groups and the L1 controls on all the three sentence types (for AA_PP: $F(2, 56) = 15.20, p < 0.001$; for AA_HL: $F(2, 56) = 29.90, p < 0.001$; for AA_LH: $F(2, 56) = 30.58, p < 0.001$). *Post hoc* Bonferrnoni tests reveal that the high proficiency group differed significantly from the L1 controls on all the three sentence types (for AA_PP: $p \leq 0.001$; for AA_HL: $p < 0.001$; for AA_LH: $p < 0.001$). The same was true of the low proficiency group on all the three sentence types ($p < 0.001$). The two learner groups differed significantly from each other on AA_HL ($p < 0.01$) and AA_LH ($p \leq 0.001$), though not on AA_PP ($p > 0.05$). These data

might suggest that the L2 learners gradually shifted from their L1-like SOV order to approach the target OSV order in interpreting Chinese NP_1NP_2V as a function of L2 proficiency. Nevertheless, the high proficiency group still failed to be native-like.

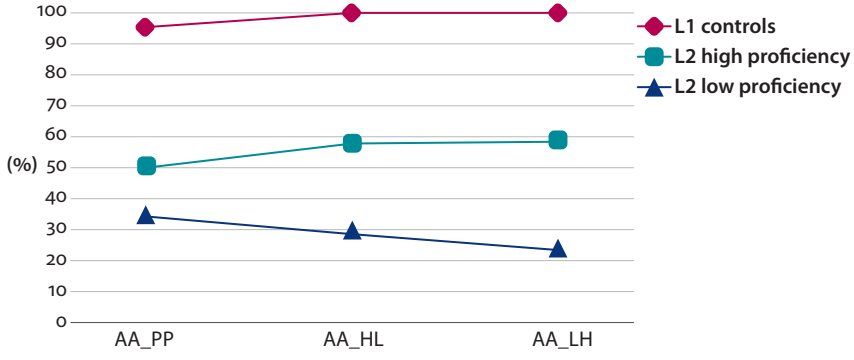

Figure 1. Mean percentage rate of selecting NP_2 as agent in three AA sentence types per proficiency group

Results on the sentence judgment task

The sentence judgment task aimed to examine the participants' sensitivity towards the interactive effect of semantic compatibility, word order and prominence on the acceptability of the four AI/IA sentence types. Recall that the IA types (i.e., IA_PP and IA_LH), meet the requirement of interpreting Chinese NP_1NP_2V sentences as being of canonical OSV order. The AI types (i.e., ?AI_PP and AI_HL) with the only animate NP in NP_1 position, force SOV interpretation for the NP_1NP_2V sentences whose acceptability depends on how prominent NP_1 is compared with NP_2. NP_1 need to be more prominent than NP_2 in order for the sentence to be acceptable. Thus compared with the AI_HL type, the AI_PP type is much less acceptable and more unnatural. Table 5 summarizes the participants' judgment on the acceptability of ?AI_PP, IA_PP, AI_HL and IA_LH.

Table 5. Mean acceptance scores (max. 6) of four AI/IA sentence types per proficiency group

	?AI_PP Mean (SD)	IA_PP Mean (SD)	AI_HL Mean (SD)	IA_LH Mean (SD)
L1 controls	1.50 (1.51)	5.63 (0.60)	2.94 (1.77)	5.10 (0.82)
L2 high proficiency	1.99 (1.47)	3.74 (1.94)	1.96 (1.35)	3.51 (1.85)
L2 low proficiency	2.13 (1.54)	3.02 (1.77)	1.87 (1.42)	2.11 (1.38)

Besides, as shown in Figure 2, the L1 controls accepted IA_PP and IA_LH fairly well, admitted AI_HL at chance level, and rejected ?AI_PP. The high proficiency group admitted IA_PP and IA_LH moderately, and appeared not to accept ?AI_PP or AI_HL, with the acceptance rates for these later two types around 30%. As for the low proficiency group, while the acceptance rate for IA_PP was at chance level, the acceptance rates for the other three sentence types were all only around a third, an indication of rejecting those three ones.

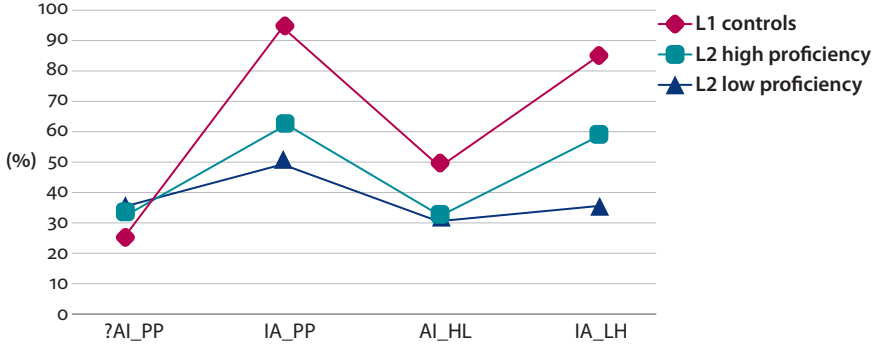

Figure 2. Mean percentage rates of accepting the four AI/IA sentence types per proficiency group

A one-way ANOVA test was conducted to compare the three participant groups. No significant difference has been found among the three on the two AI types (for ?AI_PP: $F(2, 54) = 0.86$, $p > 0.05$; for AI_HL: $F(2, 55) = 13.10$, $p > 0.05$). Nevertheless, significant difference has been attested among the three groups on the two IA types (for IA_PP: $F(2, 55) = 13.10$, $p < 0.001$; for IA_LH: $F(2, 56) = 20.80$, $p < 0.001$). On IA_PP, as indicated in *post hoc* Bonferroni tests, each of the two L2 groups differed significantly from the L1 controls (for L2 higher proficiency versus L1 controls: $p < 0.01$ and for L2 low proficiency versus L1 controls: $p < 0.001$), while the two L2 groups did not differ significantly from each other ($p > 0.05$). On IA_LH, the two L2 groups also differed significantly from the L1 controls (for L2 high proficiency versus L1 controls: $p < 0.01$; for L2 low proficiency versus L1 controls: $p < 0.001$); besides, the L2 high proficiency group also differed significantly from the L2 low group ($p < 0.01$).

The overall results might suggest that the L2 groups tended to admit IA types and reject AI ones. In other words, they found the OSV interpretation is more acceptable than the SOV interpretation for Chinese NP_1NP_2V sentences. Their acceptance of OSV interpretation increased as a function of L2 proficiency, though the L2 high proficiency group still failed to be native-like in this aspect.

What has interested us on the sentence acceptance task is to find out whether the L2 learners were able to access the syntax-semantics interface to distinguish the acceptable sentences types (IA_PP, AI_HL and IA_LH) from the unacceptable one (?AI_PP). For that purpose, a repeated measure ANOVA was carried out on the comparison of all four sentence types for all three participant groups.

For the L1 controls, *post hoc* Bonferroni tests following the repeated measure ANOVA ($F(2.03, 32.50) = 62.03$, $p < 0.001$) reveal a significant contrast between each of the three acceptable types versus the unacceptable one (for IA_PP versus ?AI_PP: $p < 0.001$; for AI_HL versus ?AI_PP: $p < 0.01$; and for IA_LH versus ?AI_PP: $p < 0.001$). Besides, the tests also indicate a significant difference on the pair-wise comparison among the three acceptable sentences (for IA_PP versus AI_HL: $p < 0.001$; for IA_PP versus IA_LH: $p < 0.05$; for AI_HL versus IA_LH: $p < 0.001$), which might suggest that among all the three acceptable sentences, IA_PP was most readily accepted by the Chinese natives, followed by IA_LH, then by AI_HL.

For the L2 high proficiency group, *post hoc* Bonferroni tests following the repeated measure ANOVA ($F(1.95,37.02) = 8.99$, $p \leq 0.001$) has attested a significant difference in pairs between ?AI_PP and IA_PP ($p < 0.05$), and between AI_HL and IA_LH ($p < 0.05$). But no significant difference has been found between ?AI_PP and AI_HL ($p > 0.05$), or between IA_PP and IA_LH ($p > 0.05$). The results suggest the factor of the position of the animate NP made a difference in their judgment while the factor of relative prominence of the two NPs made no significant difference. Recall that it is possible for animate NP_1 to be interpreted as agent of the verb in the AI type, on the condition that the animate NP_1 is more prominent than the inanimate NP_2. No significant contrast was found between AI_HL and ?AI_PP in the L2 high proficiency group's performance. It suggests the group has not developed sensitivity to the prominence condition on interpreting an animate NP_1 as the agent of the verb.

For the L2 low proficiency group, a repeated measure ANOVA reveals a marginally significant difference among all four sentence types ($F(1.91,36.24) = 3.30$, $p = 0.05$). *Post hoc* ANOVA reveals that the significant contrast was between IA_PP and IA_LH only ($p < 0.05$), whereas the other pairs among the four sentence types indicate no significant contrast ($p > 0.05$). Interestingly, the L2 low proficiency group seemed not particular about whether the animate NP appears in NP_1 or NP_2 position, as the acceptance scores on ?AI_PP versus IA_PP and those on AI_HL versus IA_LH both yielded no significant contrast ($p > 0.05$). These results suggest that the position of the animate NP made no significant judgment difference. The performance of the L2 low proficiency group in this respect differed from that of the L2 high proficiency group; the latter, as shown above, exhibited sensitivity to the position of the animate NP in their acceptability judgment of NP_1NP_2V sentences.

To sum up, on AA types, the L2 low proficiency group tended to assign its L1 canonical SOV interpretation rather than the target OSV interpretation to those

sentences, while the L2 high proficiency group seems to show no preference towards the SOV interpretation or towards the OSV interpretation.

On AI/IA types, the L2 low proficiency group made no significant distinction between AI and IA types, suggesting that the animacy factor overrode the word order factor of the two NPs in its judgment of these sentence types. The L2 high proficiency group, on the other hand, admitted IA types and rejected AI types including the licit AI_HL type. It indicates that they stuck to Chinese canonical word order OSV for interpretation too rigidly and lacked sensitivity to the interactive effect of semantic compatibility and prominence factors which can give rise to the licit SOV interpretation of Chinese NP_1NP_2V sentences as in AI_HL type.

4.3.3 *Analysis in terms of word order groups*

In this second kind of analysis, we are concerned about how individual Japanese-speaking learners performed on Chinese NP_1NP_2V sentences. Specifically, we would like to know whether the Japanese speakers who had successfully acquired the canonical OSV interpretation of Chinese NP_1NP_2V were able to judge the acceptability of a noncanonical SOV interpretation of Chinese NP_1NP_2V, which is the consequence of the interactive effect of semantic compatibility and prominence. Besides, we would also like to know whether the Japanese speakers who preferred their L1-like canonical SOV interpretation of Chinese NP_1NP_2V would show any sensitivity to semantic compatibility (animacy) effect and prominence effect in judging Chinese NP_1NP_2V sentences.

For these purposes, we sorted out two groups from all the Japanese participants in the study, based on their performance on the AA_PP type regardless of their Chinese proficiency. One group consisted of 19 Japanese participants who selected NP_2 as agent on AA_PP three out of all four times, exhibiting the canonical OSV interpretation of Chinese NP_1NP_2V consistently. We call this group J_OSV.[4] The other group was comprised of 33 Japanese participants who had selected NP_1 as the agent on AA_PP three out of all four times, showing their L1-like canonical SOV interpretation of Chinese NP_1NP_2V consistently. We label this group as J_SOV.

In the following, we look at how J_OSV learners and J_SOV learners dealt with the more complex interface properties. To be more specific, we examine whether semantic compatibility and prominence factors would affect their preferred OSV or SOV interpretation of Chinese NP_1NP_2V.

With regard to the factor of semantic compatibility, we compared ?AI_PP with IA_PP. The prominence of the NPs is always held constant within and across the

4. It has been found that 5 Japanese participants out of the total 59 rejected all the test sentences in the sentence acceptance task. In an interview after the test, they revealed that NP_1NP_2V sounded incorrect to them in Chinese, and they permitted NP_1VNP_2 order in Chinese only. These 5 participants were screened out in the data analysis of word order groups.

two sentence types. The difference between the two types lies in the position of the semantically compatible NP, the semantically compatible NP being NP_1 in ?AI_PP (thus giving rise to a SOV interpretation) and being NP_2 in IA_PP (thus giving rise to a OSV interpretation). If learners are susceptible to semantic compatibility alone, then both sentence types would be equally acceptable to them, no matter which position the semantically compatible NP takes. A paired t-test on the responses of ?AI_PP and IA_PP shows that the L1 controls accepted IA_PP and reject ?AI_PP correctly, the contrast being significant ($t(16) = 10.98$, $p < 0.001$). J_OSV learners also showed a significant contrast ($t(17) = 3.19$, $p = 0.05$). J_SOV learners, nevertheless, found both types were similarly acceptable ($t(26) = 2.56$, $p > 0.05$). The data indicate that both the J_OSV learners and L1 controls were not swayed by the semantic compatibility factor alone while J_SOV learners were.

With regard to prominence, we examined whether the two word order learner groups were affected by the relative prominence weights between NP_1 and NP_2 in the AI sentences when judging the acceptability of these sentences. Recall that prominence plays a key role in licensing the SOV interpretation of AI sentences. Both ?AI_PP and AI_HL, with the only animate NP in NP_1 position, force the SOV interpretation whose acceptability depends on how prominent NP_1 is compared with NP_2. NP_1 need to be more prominent than NP_2 in order for the sentence to be acceptable. Thus compared with the AI_HL type, the ?AI_PP type is much less acceptable and more unnatural.

The L1 controls demonstrated the expected contrast between ?AI_PP and AI_HL ($t(16) = 4.22$, $p = 0.001$). The J_OSV learners did not quite admit either of the sentence type ($t(17) = 0.44$, $p > 0.05$). The J_SOV learners admitted ?AI_PP and AI_HL around chance levels, the contrast being insignificant ($t(26) = 1.98$, $p > 0.05$). The data indicate that both J_OSV and J_SOV learners failed to access prominence contrast of the two NPs in AI sentences to distinguish the acceptable SOV interpretation from the unacceptable SOV interpretation on AI sentences, a sign of difficulty with grammatical properties interfacing syntax and semantics.

5. Discussion

5.1 In support of Version 1 of the Interface Hypothesis

We asked two research questions in Section 4.1 concerning Japanese speakers' acquisition of the OSV interpretation and the SOV interpretation of Chinese NP_1NP_2V sentences, the former being a syntactic property while the latter being related to syntax-semantics interface.

The data analyses of the present study reveal that the Japanese speakers can succeed in acquiring the canonical OSV interpretation of Chinese NP_1NP_2V. The L2 high proficiency group fares better than the low proficiency group in acquiring the canonical OSV word order of AA sentence types, a sign of syntactic improvement with the increase of L2 proficiency. Besides, as we have seen in Section 4.3.3, nineteen individual Japanese speakers have shown consistent preference for canonical OSV interpretation of Chinese NP_1NP_2V. These results suggest that Japanese speakers can acquire the syntactic property concerning the interpretation of Chinese NP_1NP_2V.

On the other hand, the Japanese speakers have difficulties in judging the acceptability of SOV interpretation of Chinese NP_1NP_2V. They fail to access the prominence contrast of NPs to differentiate between licit SOV interpretation of AI_HL and illicit SOV interpretation of ?AI_PP. As shown in Section 4.3.2, no progress is made by the Japanese speakers with the increase of L2 proficiency in this aspect. The L2 learners at both high and low proficiency levels have demonstrated the similar failure in differentiating between the AI_HL and ?AI_PP. Moreover, as indicated in Section 4.3.3, even for those J_OSV learners who have acquired canonical OSV order for NP_1NP_2V, they also have difficulties in making a significant distinction between AI_HL and ?AI_PP. These results point to Japanese speakers' problematic performance on the interpretation of Chinese NP_1NP_2V at the syntax-semantics interface.

Overall, the results provide evidences to challenge Tsimpli and Sorace's (2006) claim of Version 2 of the Interface Hypothesis whereby internal interfaces like syntax-semantics are unproblematic in L2 acquisition. Meanwhile, these results offer evidences in support of Version 1 of the Interface Hypothesis in Sorace (2005, 2006) whereby interfaces are inherently more difficult to acquire than the narrow syntax.

5.2 Learners rigidify Chinese OSV order

An interesting finding in the present study is that some Japanese learners are stuck in the canonical OSV interpretation of Chinese $NP_1\ NP_2\ V$ sentences. It has been shown that the L2 high proficiency learners and the J_OSV learners rigidify OSV order in interpreting Chinese NP_1NP_2V. They interpret $NP_1\ NP_2\ V$ in OSV fashion only and show a sweeping rejection of all the SOV interpretations of Chinese NP_1NP_2V even including the acceptable AI_HL sentences.

Similar findings on L2 learners' overreliance on word order in parsing NP_1NP_2V are also attested in other similar L2 acquisition studies. In Ito's (1984) study (as cited in Kilborn & Ito 1989), English-speaking learners of Japanese demonstrated an even greater degree of reliance on Japanese canonical SOV word order than native Japanese. Similarly, Sasaki (1994) reported that the English-speaking learners of intermediate L2 Japanese proficiency overused SOV scheme than native Japanese.

The heavy reliance on word order in Japanese L2 acquisition was attributed to the learners' focus learning strategy on word order as a clue to parse NP_1NP_2V (Sasaki & MacWhinney 2006; but see also Kilborn & Ito's (1989) meta-transfer account). Sasaki and MacWhinney (2006: 314) suggested that "learners often try to pick up one highly available and accordingly predictive cue or pattern at a time and develop its strength rapidly, relative to its actual reliability".

The idea may as well account for our Japanese speakers' overreliance on Chinese OSV order. Recall Chinese is a language lacking overt grammatical markers to indicate the agent role of the verb in sentences, as opposed to the rich particle system in Japanese. As Japanese speakers learning Chinese, except for semantic compatibility, word order is a salient clue for them to assign the agent role in Chinese NP_1NP_2V. Chinese NP_1 NP_2 V has two possible word order alternations, namely, OSV and SOV. The OSV order is often used to promote the sentence object to be topic, whereas SOV is noncanonical and pragmatically restricted to the situation in which the speaker wants to emphasize or contrast (Li & Thompson 1981; Sun & Givón 1985). Given such a difference, the Japanese speakers might have picked up OSV over SOV from Chinese input as a predominant word order cue and focus on it to parse Chinese NP_1NP_2V sentences. The more subtle factor like prominence that can change Chinese canonical word order interpretation may be acquired late.

5.3 Learners rely on animacy (semantic compatibility)

Another interesting finding is that some Japanese speakers are susceptible to the animacy effect alone when judging the acceptability of Chinese NP_1NP_2V sentences. The L2 low proficiency learners and J_SOV learners rely on animacy rather than word order to determine the acceptability of AI and IA sentences, resulting in no significant differentiation between the two sentence types.

The finding is in line with some other similar L2 studies involving a variety of first and target language pairs including Japanese, English, Italian and Chinese (e.g. Gass 1987; Sasaki 1991; Liu et al., 1992). According to those studies, Japanese, Italian and Chinese are animacy strategy languages, in which animacy overrides word order, as opposed to the syntactic strategy language English, in which word order overrides animacy.[5] Gass found that her English-speaking learners of Italian and

5. We do not hold that Chinese is a typical animacy strategy language. Admittedly, animacy can override word order in some cases like AI_HL, in which animacy apparently "wins" over canonical OSV order. However, strictly speaking, it is not animacy per se but rather the interactive effect of animacy and prominence that is at work. Prominence plays a key role in licensing AI sentences. When AI sentences lack an appropriate prominence contrast between the NP_1s and the NP_2s, the sentences turn out to be unacceptable, like ?AI_PP type.

Italian-speaking learners of English both employed Italian-like animacy strategy in parsing the target language sentences. Based on her finding, Gass hypothesized that the animacy strategy is easier to adopt than the syntactic strategy in L2 acquisition.

It should be noted that animacy strategy is only salient with the learners of low L2 proficiency or those undergoing L1 transfer (of Japanese SOV word order) in the present study. As for the learners of high L2 proficiency or those beyond L1 transfer, they are not susceptible to the effect of animacy. As shown in our results, they abandon the animacy strategy and adopt the syntactic strategy (the rigidified OSV order strategy) instead. It seems that animacy strategy is at best a strategy of the learners at early stages when they have not acquired the relevant grammatical properties (word order, for example) to parse sentences in the target language.

5.4 Some unexpected responses

As we have seen in Section 4.3.2, for the Chinese controls and the two L2 proficiency groups, the acceptance scores of IA_PP following the sequence of "*na*+I *you*+A V" (see Table 5) are the highest among all the acceptable sentence types. In the Chinese control's and the L2 low proficiency group's performance, their acceptance scores of IA_PP are even significantly higher than those of IA_HL, a simple string of "I A V", in which the two nouns are without modifiers. Why is there a marked contrast between the two IA types? We suppose that it has something to do with the function of OSV sentences. As mentioned in Section 5.2, OSV sentences are used to topicalize the sentence object. When a definite marker *na* is attached to the object, the topic-hood of the object is enhanced, and so is the acceptability of the sentence. Given such, it is not difficult to understand that IA_PP is more readily admitted than IA_HL, as the former has a definite marker going with the object while the latter does not.

On the other hand, the acceptance scores of AI_HL type are seemingly low in the participants' responses though the type is considered to be theoretically acceptable. The Chinese controls admit it at the rate of only 49%. Why is the acceptance rate so low? As pointed out above, the SOV interpretation for NP_1NP_2V is marked in Chinese and its use is pragmatically restricted. In our test, AI_HL sentences were presented in a context-free setting to the participants and force SOV interpretations. It might be the case that these sentences are judged unfavorably without appropriate context. The other possible reason, we speculate, concerns the prominence difference between the two NPs in AI_HL sentences. The prominence difference between the NP_1 and the NP_2 of AI_HL is induced solely from the animacy contrast between the two NPs. In other words, the prominence gap between the two NPs may not be wide enough for the sentence to be readily accepted. If we

incorporate a definite marker into NP_1, NP_1 will get an even higher prominence compared with NP_2, and then it might help improve the acceptance of the sentence. We leave this issue for future research.

6. Conclusions

We have looked at the L2 acquisition of the interpretation of Chinese NP_1NP_2V construction by Japanese-speaking learners of Chinese. The canonical OSV interpretation of Chinese NP_1NP_2V is a syntactic phenomenon while the SOV interpretation of Chinese NP_1NP_2V involves the interactive effect of semantic compatibility and prominence, a phenomenon at the syntax-semantics interface. The L2 acquisition of the syntax-semantics interface property (the correct judgment on the SOV interpretation) is more difficult to acquire than that of the syntactic property (the OSV interpretation), which supports Sorace's (2005, 2006) Version 1 of the Interface Hypothesis. As the learners fail in integrating the semantic and syntactic elements at interface regarding the SOV interpretation of Chinese NP_1NP_2V, they resort to animacy (semantic compatibility) strategy and/or the rigidified word order strategy to parse Chinese NP_1NP_2V sentences.

Acknowledgements

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Language index

Subject index

This volume is an important contribution to the theoretical and empirical study of the interactions of grammatical components in Chinese and other languages. With contributions by Edward L. Keenan, Henk van Riemsdijk, Alain Rouveret, and scholars in Chinese Linguistics, this volume investigates the common structural properties that may be considered as possible candidates for UG. It addresses syntactic and semantic issues such as anaphora universals over non-isomorphic languages, the role that the forces of attraction and repulsion play in the grammar of natural languages, computational and semantic aspects of resumption, the dichotomy between inner and outer reflexive adverbials, system repairing strategies at interfaces, the v-copy construction in Chinese, the scope of disjunction, interactions between focus, negation and event quantification, null object constructions and VP-Ellipsis, child language acquisition of nominal structure, word order and referentiality as well as second language acquisition of interface properties in Chinese double NP constructions. This volume will be of interest to students and researchers of syntax, semantics, theoretical linguistics, and language acquisition, as well as scholars in Chinese linguistics.

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