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X^{max} as the Initial Node of Generative Grammar
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The notion of sentence traditionally and historically has occupied a privileged place in research on language, one formalized by Chomsky (1965: 66), who claimed, "S is the designated *initial symbol* of the grammar (representing the category 'Sentence')." Research within generative grammar has operated under this assumption of a single sentential initial node ever since. I argue here, however, that consideration of a class of nonsentential constituents motivates the generalization that the initial node of a generative grammar is X^{max}. This proposal allows a shift in emphasis from the sentences of a language to the structures generated by the grammar of a language, a set of structures within which sentences, clauses, and nonsentential constituents have equal status.

Participants in a discourse regularly use utterances that are smaller than grammatically complete sentences; the traditional name for such a nonsentential utterance is 'fragment', and the typical exemplar of a fragment is an independent major lexical category in answer to a question as in the examples of (1):

(1a) A: What happened in 1974?
       B: A scandal in the White House.
(1b) A: What did President Nixon and his Executive staff
          try to do?
       B: Obstruct justice.
(1c) A: When was Nixon elected President?
       B: In 1968 and 1972.
(1d) A: How did he feel when he was forced to resign?
       B: Very angry.
(1e) A: Has a U.S. President resigned before?
       B: Never.

Linguists (e.g., Quirk et al., 1972; Morgan, 1973; Sag, 1976) traditionally have assumed that the framework of deletion under identity accounts for fragments. In contrast, I claim that the examples in (1) are generated within a grammar as syntactic structures dominated by initial nodes of NP, VP, and so on, rather than S; I call these independent structures dominated by major lexical category initial nodes 'nonsentential constituent structures'. In a larger work (Barton, in press), I develop a theory of nonsentential constituents by describing two interacting models: an autonomous competence model of the grammar of nonsentential constituent structures and a modular pragmatic model of the interpretation of independent constituent utterances

in context. In this paper, I briefly describe some aspects of the D-structure representation of nonsentential constituent structures, focusing on the generalization that X^{max} is the initial node of a generative grammar and exploring the implications of this generalization for the version of X-bar theory within Government-Binding.

Motivating the claim that independent major lexical categories are nonsentential constituent structures dominated by major lexical category initial nodes requires arguments against an ellipsis analysis; the arguments presented here extend the work of Yanofsky (1978) and Napoli (1982). An ellipsis analysis works straightforwardly for examples like those in (1), where the question provides a linguistic context with a discourse controller triggering ellipsis rules. An ellipsis analysis, however, cannot account for well-formed independent major lexical category structures that have no discourse controller to trigger recoverable deletion under identity. Consider the sequences in (2), especially the sequence in (2a):

(2a)   A: The White House staff doesn't visit Tip O'Neill in his Congressional office.
        B: Old grudge.

(2b)   A: John doesn't know what the best defense against criminal charges would be.
        B: Ask any lawyer.

(2c)   A: They always put cash campaign contributions in a passbook savings account.
        B: Cautious.

(2d)   A: The President suggested forming a permanent Council on Ethics in Government.
        B: Not with my tax money!

(2e)   A: John probably would be involved in criminal activity if he carries too much money out of the country on his vacations.
        B: Really?

None of the major lexical category structures in (2) occurs within a linguistic context with a discourse controller for ellipsis. The sequences of (3) show that the NP old grudge cannot appear at the beginning, in the middle, or at the end of the previous sentence in the discourse:

(3a)   *Old grudge the White House staff doesn't visit Tip O'Neill in his Congressional office

(3b)   *The White House staff doesn't, old grudge, visit Tip O'Neill in his Congressional office

(3c)   *The White House staff doesn't visit old grudge Tip O'Neill in his Congressional office

(3d)   *The White House staff doesn't visit Tip O'Neill in his Congressional office old grudge

In addition, an ellipsis analysis is unable to account for the examples in (2) without violating the Condition of Recoverability on Deletion. It is possible to construct a variety of possible full sentence sources for each major lexical category in (2); consider some possible sources for the NP <u>old grudge</u> in (4):

(4a)   That's because of an old grudge.

(4b)   The White House staff has an old grudge against Tip O'Neill.

(4c)   Tip O'Neill has an old grudge against the White House staff.

(4d)   He never forgave them for an old grudge.

(4e)   They never forgave him for an old grudge.

(4f)   There's an old grudge between them.

Since each representation is different, ellipsis rules would be operating on an indeterminate full sentence source. Any deletion would be free, creating undecidability within the grammar, just the consequence the Condition of Recoverability protects against.

A nonsentential constituent structure analysis, however, automatically describes structures like those in (2), claiming that they are dominated by major lexical category initial nodes as shown in the structures of (5):

(5a)   [$_{N''}$ [$_{N'}$ [$_{ADJ''}$ old] [$_N$ grudge]]]

(5b)   [$_{V''}$ [$_{V'}$ [$_V$ ask] [$_{N''}$ any lawyer]]]

(5c)   [$_{ADJ''}$ [$_{ADJ'}$ [$_{ADJ}$ cautious]]]

(5d)   [$_{P''}$ [$_{ADV''}$ not] [$_{P'}$ [$_P$ with] [$_{N''}$ my tax money]]]

(5e)   [$_{ADV''}$ [$_{ADV'}$ [$_{ADV}$ really]]]

This analysis does not violate the Condition of Recoverability because it does not postulate any deletion. Further, it is an analysis which respects the constraint of autonomy of syntax: an ellipsis analysis strongly violates autonomy by requiring direct input from a discourse context in order to determine the grammatical well-formedness of independent major lexical categories; as I will show below, a nonsentential constituent structure analysis describes the well-formedness or ill-formedness of independent major lexical categories solely according to grammar-internal criteria. In sum, it is the best-motivated analysis to account for *all* independent major lexical category

structures because it accounts for the examples of (1) as well as (2) without violating the constraint of autonomy.

Chomsky (1986: 3) suggests that the schema in (6a) and (6b) constitutes X-bar theory, extending it to account for the major non-lexical categories of sentences and clauses as in (6c) and (6d):

(6a) X'' ---> X''* X'
(6b) X' ---> X X''*
(6c) S = INFL" = [$_{NP}$ [$_{I'}$ I [$_{VP}$ V . . .]]]
(6d) S' = C'' = [. . . [$_{C'}$ C I"]]

Integrating the generalization that major lexical categories can function as initial nodes does not involve a change in this schema of X-bar theory. It does, however, motivate the generalization that the initial node of a generative grammar is X^{max}. This generalization correctly describes all of the major syntactic categories generated by a grammar, as shown in the examples of (7). The maximal projection INFL" generates sentence structures as in (7a); the maximal projection C" generates independent clausal structures as in (7b); and the maximal projection of a lexical category generates nonsentential constituent structures as in (7c) and (7d):

(7a) A: John doesn't know what the best defense against criminal charges would be.
B: He could ask any lawyer.
[$_{INFL''}$ [$_{N''}$ he] [$_{INFL'}$ [$_{INFL}$ [$_M$ could]]
[$_{V''}$ [$_{V'}$ [$_V$ ask] [$_{N''}$ any lawyer]]]]]

(7b) A: John doesn't know what the best defense against criminal charges would be.
B: Whether he asks a lawyer or not.
[$_{C''}$ [$_{C'}$ [$_C$ whether]
[$_{INFL''}$ he asks a lawyer or not]]]

(7c) A: John doesn't know what the best defense against criminal charges would be.
B: Ask any lawyer.
[$_{V''}$ [$_{V'}$ [$_V$ ask] [$_{N''}$ any lawyer]]]

(7d) A: John won't visit the best criminal lawyer in Washington, D.C.
B: Old grudge.
[$_{N''}$ [$_{N'}$ [$_{ADJ''}$ old] [$_N$ grudge]]]

The initial node of X^{max} interacts with general and specific licensing principles in GB in order to describe well-formed sentence structures and nonsentential constituent structures. The general licensing principles that are particularly relevant for

a consideration of sentential and nonsentential structures are the Projection Principle of Chomsky (1981, 1986) and the Predication Principle of Williams (1980) because the two classes of structures contrast in terms of their interaction with them. Well-formed sentence structures are licensed by a combination of the Projection Principle and the Predication Principle, which ensures that their syntactic representations preserve not only the lexical structure of the internal constituents but also the predication structure of the sentence, which includes a subject and a predicate. Well-formed nonsentential constituent structures, in contrast, are licensed by the Projection Principle alone, which ensures that their syntactic representations preserve the lexical structure of their heads, which accounts for their well-formedness in a general way.

Nonsentential constituent structures are well-formed if they conform to the expansion properties of their heads; conversely, they are ill-formed if they violate these properties, as shown by the VP examples in (8):

(8a)   A: John did something stupid, but I'm not sure what.
       B: Put a bug in Democratic headquarters.
          $[_{V''}$ $[_{V'}$ $[_V$ put] $[_{N''}$ a bug]
                           PATIENT
          $[_{P''}$ $[_{P'}$ $[_P$ in] $[_{N''}$ Democratic headquarters]]]]]
                           LOCATION

(8b)   B: *Put a bug a camera in the Democratic party
          headquarters
          *$[_{V''}$ $[_{V'}$ $[_V$ put] $[_{N''}$ a bug] $[_{N''}$ a camera]
          $[_{P''}$ $[_{P'}$ $[_P$ in] $[_{N''}$ Democratic headquarters]]]]]

In (8a), each NP is selected once as an argument; in (8b), however, although the verb put selects only two arguments, there are three NPs, which violates the one-to-one correspondence required by the θ-Criterion within the Projection Principle.

Chomsky (1981, 1986) often points out that small changes in the principles of GB have complex consequences throughout the theory, and generalizing the initial node of the grammar to X^{max} does indeed have a significant consequence, namely, the generation and description of nonsentential constituent structures. At the same time, though, Chomsky also warns, echoing Bresnan (1976a), that a proposed change is not a contribution if it causes proliferation elsewhere in the theory. The description of nonsentential constituent structures, however, does not require any new mechanisms or rules within the grammar because most of the grammatical properties of well-formed nonsentential constituent structures fall out from the D-structure licensing interaction of X-bar theory and the Projection Principle.

In addition to describing the class of nonsentential constituent structures, the proposed generalization to X^{max} also has some interesting theoretical consequences in terms of issues in research on X-bar theory. First, it supports the position that sentence is integrated as a category within the set of major syntactic categories in X-bar theory; it also provides specific evidence that the category of sentence should be integrated as a non-lexical projection of INFL rather than as a lexical projection of V.[1] Second, it illustrates the need for a clarification of the relationship between major and minor categories in terms of their participation in X-bar theory. Third, it motivates a strict version of Pullum's (1985) condition of Centrality on the version of X-bar theory within Government-Binding.

The non-uniqueness of sentence as one category among the set of major syntactic categories is formally captured by the proposed generalization that X^{max} is the initial node of the grammar: within X^{max}, INFL" is exactly equivalent to the other major non-lexical category, C", as well as to the major lexical categories represented by X", in that all of these categories are subject to the restrictions of the X-bar schema in (6). In addition, in the version of X-bar theory proposed here, the category INFL" is a distinct category within the set of major syntactic categories, and a maximal projection of V cannot be an initial node for a sentence derivation because it would be impossible to distinguish a sentence structure from a nonsentential VP constituent structure. Consider the contrast between the sentence structure in (7a) and the VP constituent structure in (7c). The main semantic characteristic of a sentence is its argument-predicate structure, which corresponds with the syntactic selection of a subject, and this compositional structure is mediated by INFL. The category of INFL also determines other syntactic features of a sentence, notably its tense and agreement. In contrast, the maximal projection of V describes a nonsentential VP constituent structure. One semantic characteristic of a nonsentential VP is its lack of an overt argument, which corresponds to its lack of a subject. This lack of compositional structure is indicated by the absence of INFL, which also determines other syntactic features of an independent VP, notably its lack of tense and agreement. VP as an initial node generates a nonsentential constituent structure in the base form of the verb. Under the initial node of X^{max}, then, the distinction between a nonsentential VP constituent structure and an INFL" sentence structure is possible, and both sentences and independent VPs are accounted for.

A second implication of this research is the illustration of the need for a clarification of the status of major and minor categories within X-bar theory. Throughout this paper, I have included examples of nonsentential ADVPs in parallel with examples of

NP, VP, ADJP, and PP, tacitly implying that the category of ADVP has major category status, at least with respect to the set of nonsentential constituent structures. Yet the category of Adverb generally has been regarded as a minor one in the literature (cf. Jackendoff, 1977a,b; Emonds, 1985; van Riemsdijk and Williams, 1986). The unclear status of ADVP raises the larger question of exactly which categories participate in X-bar theory.

According to Jackendoff's (1977a,b) feature matrix, the crucial feature for distinguishing a major category from a minor category is the ability of the category to occur with a complement. Minor categories such as Adverbs, Jackendoff claims, cannot occur with complements. This generalization, though, is not completely accurate. Although most adverbs, including all -ly forms, do not select sentential complements, a subset of lexical adverbs do. Adverbs like enough and now, for instance, regularly select that-complements, as shown in the examples of (9):

(9a) A: John's making an effort to improve his
          performance on the job.
      B: Now that it's too late.
          [ADV" [ADV' [ADV now] [C" that it's too late]]]
(9b) A: He has some credibility left.
      B: Enough that he'll be able to get another position.
          [ADV" [ADV' [ADV enough] [C" that it's too late]]]

The presence of the that complementizer indicates that these structures can be analyzed as adverbs with sentential complements. Also, certain adverbs select prepositional complements as in the examples of (10):

(10a) A: Does John discuss campaign contributions in
          connection with ethical campaign practices?
      B: Independently from any ethical issue.
          [ADV" [ADV' [ADV independently]
          [P" from any ethical issue]]]
(10b) A: Did John act alone when he accepted illegal
          contributions?
      B: Independently of any official body.
          [ADV" [ADV' [ADV independently]
          [P" of any official body]]]
(10c) A: Does John discuss campaign contributions and
          ethical campaign practices?
      B: Differently from every one else.
          [ADV" [ADV' [ADV differently]
          [P" from anyone else]]]

These structures are not examples of an Adverb specifier for a PP because the adverb clearly governs the choice of the preposition: independently and differently cannot occur with any preposition, only the specific prepositions they select as complements.

Another approach to explaining the status of ADVP is to conflate the category of Adverb with the category of Adjective, which is mentioned by Emonds (1985) and briefly discussed by Radford (1988). Radford argues that Adjectives and Adverbs are members of the same category because they are in complementary distribution, Adjectives modifying nominal constituents and Adverbs modifying all other constituents. This generalization, too, though, is not completely accurate, since some adverbs can modify nominal elements, as shown in the examples of (11), some of which have been taken from Quirk et al. (1972):

(11a) rather a fool
(11b) quite a party
(11c) never a talker
(11d) ever the gentleman
(11e) really an idiot
(11f) nearly everybody
(11g) roughly half
(11h) virtually all
(11i) almost one thousand

ADVP, in short, seems to be able to function as a major category, albeit in a rather restricted way, so another way to account for the properties of ADVP may be to claim that ADVP is, in fact, a major category of English.

Such an inclusion of ADVP into the set of major categories correctly predicts a number of facts not only about the specific category of ADVP but also about the general distribution and properties of major and minor categories. Consider once more Chomsky's schema for X-bar theory in (6). The schema is formulated in terms of major categories (X''), and Stowell (1981: 70) suggests a principle which specifically states that non-head terms in an expansion, that is, specifiers, modifiers, and complements, are major categories. Together, Chomsky's schema and Stowell's principle suggest a constraint restricting the participating categories in X-bar theory to major categories, but there is a significant contradiction between this constraint and the distribution of ADVP. If ADVP is a minor category, then it cannot participate in the general distribution of major categories as heads, specifiers, complements, modifiers, and, as proposed here, initial nodes. Assigning ADVP the status of major category, though, automatically explains its occurrence as an initial node in the derivation of a nonsentential constituent structure; it also

automatically explains the occurrence of ADVP as a head and as a complement or modifier of various categories. The proposed major category status of ADVP, however, also captures another generalization: only by assigning to ADVP the status of major category can the schema for X-bar theory preserve the general claim that specifiers are themselves major categories.

ADVPs function as specifiers for every major category, including themselves, as shown in the examples of (12):

(12a) A: John and Mary are giving up their jobs as a Congressional aides.
B: Such fools.
[N'' [ADV'' such] [N' [N fools]]]

(12b) A: They think they will protest political corruption by resigning.
B: Rather foolish.
[ADJ'' [ADV'' rather] [ADJ' [ADJ foolish]]]

(12c) A: They're worried, though, about the effect on their careers.
B: Directly off the fast track.
[P'' [ADV'' directly] [P' [P off] [N'' the fast track]]]

(12d) A: Mary has some good advice for John.
B: Never act so hastily.
[V'' [ADV'' never] [V' [V act]] [ADV'' so hastily]]

(12e) A: John may regret his resignation someday.
B: Very quickly.
[ADV'' [ADV'' very] [ADV' [ADV quickly]]]

(12f) Certainly John acted foolishly by resigning.
[INFL'' [ADV'' certainly] [N'' John]
[INFL' [V'' acted foolishly by resigning]]]

(12g) A: Do you think that his boss might accept an apology from John?
B: Only if he acts quickly.
[C'' [ADV'' only] [C' [C if] [INFL'' he acts quickly]]]

Assigning to ADVP the status of major category correctly predicts its general ability to function as a specifier as well as its ability to function as a head, a complement, a modifier, and an initial node.[2]

This consideration of ADVPs provides evidence in support of a constraint restricting the participating categories in X-bar theory to major categories. Although such a constraint correctly predicts certain facts about the set of major categories necessarily including ADVPs, it also predicts that minor categories, such as Determiners, for instance, are theoretically distinct from major categories in their properties and their distribution.[3] In

particular, the constraint correctly predicts that minor categories cannot be initial nodes in the derivation of nonsentential constituent structures, which is shown to be true in the examples of (13), where the determiners a and the are ill-formed as independent constituents:

(13a) A: John has something for Mary.
       B: *A
           *[$_{DET}$ a]
(13b) A: John has a job in the White House.
       B: *The
           *[$_{DET}$ the]

Determiners often are defined as specifiers, but unlike the major category of ADVP, which can function generally as a specifier for any category, the minor category of Determiner functions as a specifier only in a restricted way, specifically as a specifier for the category NP. This specificity suggests that some major lexical categories occur with specific minor categories preceding them. These minor category specifiers may be selected in the lexicon, a possibility briefly mentioned by Chomsky (1986: 91); what is proposed here, in short, is that minor categories are not selected by virtue of X-bar theory. Such lexically-selected minor categories like Determiners could then occur at the X^0 level without X-bar projections, which would eliminate a frequent criticism of the analysis of minor categories with full bar projections (Newmeyer, 1986: 153): within the analysis proposed here, such superfluous structure does not exist.[4]

Although this brief analysis is speculative, it does seek to capture some generalizations about differences between major and minor categories by supporting a constraint on X-bar theory which restricts participating categories to major ones and eliminates minor categories from the X-bar system.[5] First, it correctly predicts the generality of major lexical categories, including ADVPs, as heads, complements, modifiers, and specifiers. Second, it also correctly predicts the lack of generality associated with minor categories as specifiers; it also suggests lexical selection in order to account for their lack of head-like hierarchical structure. Finally, the constraint explains the contrast in the abilities of categories to serve as the initial node in the derivation of nonsentential constituent structures: major categories can function as initial nodes because they participate in the X-bar system as a manifestation of X'', but minor categories cannot function as initial nodes because they do not participate in the X-bar system.

The generalization that X^{max} is the initial node of a generative grammar is one which could be incorporated into a number of

contemporary syntactic theories; the work above describes its integration into the version of X-bar theory current in research within the GB framework. There is also a great deal of interesting work on X-bar theory within the framework of Generalized Phrase Structure Grammar, and I would like to conclude by considering the work presented here with respect to a point in Pullum's (1985) review of X-bar theory.

Pullum discusses a number of defining conditions associated with formulations of X-bar theory, including Lexicality, Succession, Uniformity, Maximality, and Centrality. The condition of Centrality states that the starting symbol for a derivation must be a maximal projection of a lexical category. Most X-bar systems, though, as Pullum points out, either have violated centrality by positing S as a unique symbol for an initial node, or have preserved Centrality by incorporating the assumption that a maximal projection of V is the unique starting symbol for a derivation. Pullum suggests dropping the notion of S as a unique start symbol, which is exactly in line with the work presented here. My position on Centrality, though, is even more specific: I have argued that the privileged status of S as the single initial node is an historical accident, not a legitimate condition on grammars; I also have argued that the correct constraint on the initial symbol of a derivation is that it is a major syntactic category, with S (or INFL") simply as one of the possibilities under X^{max}. These arguments suggest preserving a strict version of Centrality as a condition on X-bar theory because the generalization of the initial node of the grammar to X^{max} ensures Centrality by specifying that that the starting symbol is the maximal projection of a major category. Although my arguments for this position support a generalization of the initial node of a grammar to X^{max} within a GB framework, I suspect that the arguments also support the same revision of X-bar theory within other grammatical frameworks as well.

Notes

[1] Jackendoff's (1977a,b) proposal integrating S into the X-bar system by making it equivalent to the maximal projection of V is the most commonly cited analysis, although he was not the only person to suggest this. Bresnan (1976b), Koster (1978), and van Riemsdijk (1978) all offer similar analyses of S as a bar projection of V. Hornstein (1977) argues against Jackendoff's proposal by showing that a separate set of rules for S is necessary to account for the distribution of negative elements, which differs across phrases and sentences. Marantz (1980) supports Jackendoff's claim, arguing that making S equivalent to V^{max} explains the parallel distribution of subjectless VPs like gerunds and

embedded sentences as well as the distribution of negative elements (*contra* Hornstein).

There has been research on the status of the category sentence within X-bar theory within other syntactic theories; Sells (1985) reviews the major proposals. Modifying a proposal suggested by Gazdar (1982), in which S and S' are instances of V" with the contrasting feature of [±Complementizer], Borsley (1983) presents a GPSG analysis in which VP and S are the same category with different features: VP is [-Subject] while S/S' is [+Subject] and S' is [+Complementizer]. In her work on Lexical Functional Grammar, Bresnan (1982) suggests that S is not integrated into X-bar theory because it is an exocentric category, not the projected from any lexical category. McCloskey (1983) provides arguments in support of Bresnan's position with an analysis of Irish as a VSO language.

In this paper, I, too, argue against the proposal that the category of sentence is a maximal projection of V, although my arguments will be based upon a consideration of nonsentential constituent structures in comparison to sentence structures within the framework of GB.

[2]I would like to emphasize the tentative nature of this discussion of ADVP as a major category. As pointed out by several participants at the WECOL conference, the examples of ADVPs in this paper form a rather unprincipled collection, including some forms (e.g., almost, such) which have been identified as quantifiers or determiners, especially when they are used as specifiers of NPs. (Selkirk, 1977; Jackendoff, 1977a,b) At the moment, however, I am assuming a definition of ADVP drawn mainly from traditional grammar, which identifies adverbs by their ability to modify other constituents, particularly verbs, adjectives, and adverbs. (Quirk et al., 1972) I recognize that this definition does not take into account work on adverbs in the generative grammar literature (McCawley (1988) gives an overview of some ways adverbs have been treated in generative grammar analyses). At this point, though, I use this general definition as a working definition of adverbs because I believe that the entire status of the category of ADVP needs reconsideration, especially if, as proposed here, ADVP is a major category. In my current research on nonsentential constituent structures, I am attempting to develop a full analysis of ADVPs. In particular, I am exploring the relation of ADVP to QP, trying to determine whether these are separate categories or whether they are in some other type of superordinate-subordinate category relationship. In my current research, I also am exploring the implications of the proposal that ADVP is a major category in terms of the syntactic feature matrix proposed by Chomsky (1970), modified by Jackendoff (1977a,b) and generally assumed in the literature. (cf., e.g., Chomsky, 1986: 2; van Riemsdijk and

Williams, 1986: 42; Sells, 1985: 30) The feature matrix works elegantly when there are four major categories, but it quickly becomes messy if there are five major categories.

[3]In the brief analysis that follows, I discuss Determiners as the sole example of a minor category because it is a relatively uncontroversial example of a minor category in English. In the text, I claim that minor categories cannot occur independently. Gregory Ward (personal communication), though, points out that in some instances, determiners do occur as independent utterances. One instance is the mention of a determiner as a name as in examples like the following sequence:

(a)   A: Name a three letter determiner in English.
      B: The.

In this instance, the determiner is actually a NP. (Lyons, 1977: 5-10) Another instance of an independent determiner is the repetition of a determiner in an echo:

(b)   A: John is the expert around here.
      B: The?

Echoes, it seems, can copy any part of a previous utterance. (McCawley, 1987; Tannen, 1987)

[4]At the WECOL conference, Tim Stowell pointed out that adopting the distinction between lexical categories and functional categories as proposed in the work of Speas (1986) automatically accounts for the ill-formedness of the examples in (13): these could be analyzed as DPs without their obligatory complements. Some of my current research is an examination of nonsentential constituent structures in terms of such a theory of phrase structure.

[5]This constraint restricting the participating categories in X-bar theory to major categories already exists in the theoretical framework of Generalized Phrase Structure Grammar. Sells points out that GPSG incorporates the following stipulation:

A category C is a minor category iff C (BAR) is undefined. (1985: 83)

For major categories, namely nouns, verbs, adjectives, and prepositions, the feature BAR = 2 (for maximal projections), which has the effect of eliminating minor categories from participating in X-bar theory.

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POSSESSOR ASCENSION IN CHOCTAW AND TZOTZIL:
A LINKING GRAMMAR ANALYSIS

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1. Introduction

A number of unrelated languages (among them Albanian, Choctaw, Georgian and Tzotzil) present alternations like the one shown in (1), or in the case of some languages, permit only the alternative shown in (1b):

(1) *Choctaw Possessor Ascension*

    a. Am-   ofi -t   mĩko ĩ-   takkon apa -tok.
       1POSS dog NOM chief 3POSS apple eat PST

    My dog ate the chief's apple.

    b. Am-   ofi -t   mĩko takkon im-   apa -tok.
       1POSS dog NOM chief apple 3DAT eat PST

    My dog ate the chief's apple.

Davies (1986) and Aissen (1987) propose analyses of these constructions in Choctaw and Tzotzil, respectively, in Relational Grammar frameworks. In both, it is claimed that in clauses like (1b), the possessor of a nominal construction has *ascended* to become an argument, specifically a 3 (i.e., an indirect object) of the main clause. Among the evidence in the above example in favor of the Possessor Ascension (PA) analysis are the disappearance of the possessive prefix '*i-*' from *takkon* 'apple', and the appearance of the dative agreement marker '*im-*' on the verb, which according to Davies indicates the existence of a final 3 (i.e., an indirect object at surface structure).

2. The RG Analyses

In Davies' approach to Choctaw, both the nominal case marking affixes and pronominal agreement markers on the verb are representative of grammatical relations (at one or more strata) of the clause in which they appear. Of the case markers, there are two, which Davies calls NOM and OBL. The NOM marker is obligatory on any full (i.e., non-pronominal) noun which is the surface subject of a clause. The OBL marker appears optionally on all other nominals. Davies calls the four pronominal agreement affixes NOM, ACC, DAT and BEN.

Most commonly, possession is marked by a prefix on the possessed noun; this possessive prefix agrees in person and number with the possessor. Returning to (1a), both 'dog' and 'apple' have possessive prefixes; as the surface subject, 'dog' gets a NOM case marker. Since both arguments are full NPs, no pronominal agreement markers appear on the verb. Examples of Choctaw clauses that contain no full NPs are given in (2):

(2) a **Chi-** **banna** **-li** **-h.**
    2ACC want 1NOM PRED

    I want you.

   b. **Chi-** **am-** **ihaksi** **-tok.**
    2ACC 1DAT forget PST

    I forgot you.

   c. Chī- nokkilli -li -h.
    2DAT hate 1NOM PRED

    I hate you.

As can be seen in these examples, these affixes (or pronominal clitics) are generally used to indicate unexpressed (or at least not overtly expressed) pronominal arguments, although third person affixes may refer to overt NPs in the clause. Davies argues that the choice of affix class (NOM, ACC, DAT, BEN) is determined by the grammatical relation or relations held by the pronominal argument, NOM being associated with 1s, ACC with 2s, DAT with 3s, and BEN, not surprisingly, with benefactives. Since 'eat' associates a pronominal "eater" with a NOM affix and a pronominal "eatee" with an ACC affix, the structure Davies associates with (1a) is as shown in (3):

(3) *Stratal Diagram for (1a)*
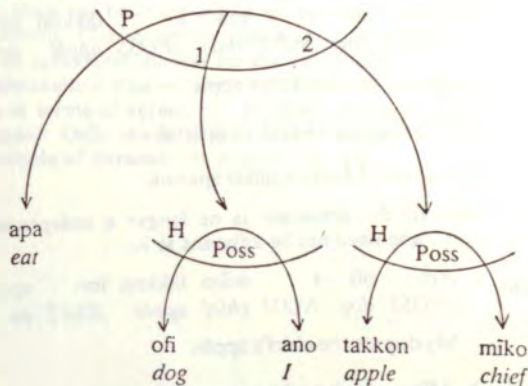
However, as seen in (1b), Choctaw also permits a construction in which a DAT affix corresponds to a possessor in the clause, and in which the possessive affix is missing from the possessed NP. Davies claims that these structures are derived from regular possessive structures as shown in (3). Since DAT affixes are associated with 3s, Davies proposes that the possessor is raised

from the nominal phrase to full argument status in the clause as a 3. The structure he associates with (1b) is shown in (4):

(4) *Stratal Diagram for (1b)*
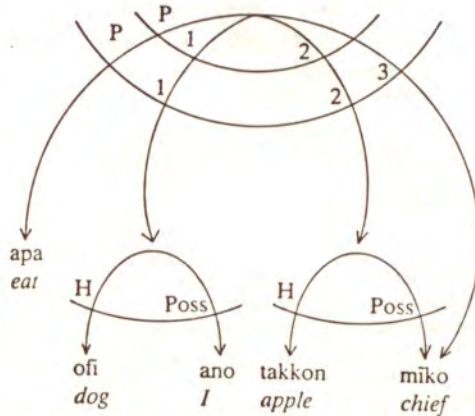
The initial stratum of (4) is the same as (3); in the next stratum, the possessor 'chief' has "ascended" to the main clause as a full argument with a grammatical relation of 3. Variations in word order demonstrate that the possessor 'chief' has achieved full argument status in (1b). While still a possessor, 'chief' must immediately precede the possessed, 'apple':

(5) a. Am-   ofi -t   mīko ī-   takkon apa -tok.
       1POSS dog NOM chief 3POSS apple   eat   PST

   My dog ate the chief's apple.

   b.*Mīko am-ofi-t ī-takkon apa-tok.

   c.*Am-ofi-t ī-takkon mīko apa-tok.

After PA, however, the possessor is no longer a codependent of the nominal node with 'apple', and need not be adjacent to it:

(6) a. Am-   ofi -t   mīko takkon im-   apa -tok.
       1POSS dog NOM chief apple 3DAT eat   PST

   My dog ate the chief's apple.

   b. Mīko am-ofi-t takkon im-apa-tok.

   c. Am-ofi-t takkon mīko im-apa-tok.

While Choctaw has four sets of pronominal agreement affixes, Tzotzil has two, which Aissen (1988) calls set A and set B. The prefixes in set A mark verbal agreement with subjects of transitive clauses, and in nominal prefixes,

mark the possessor in a nominal phrase. The prefixes in set B mark verbal agreement with the subjects of intransitive clauses and the direct objects of transitive clauses.

Crucial to the discussion of Possessor Ascension in Tzotzil, there is no third set of affixes corresponding to datives. In clauses containing an agent, a patient/theme and a recipient/benefactive, the suffix '-be' obligatorily appears on the verb and the rec/ben argument determines set B agreement; the theme/patient is not associated with any agreement marking. Some examples are shown in (7):

(7) *Ditransitive clauses in Tzotzil*

    a. 7a li Xun -e, ba y- ak' -be chitom li 7antz -e.
       topic the Xun cl go A3 give io pig   the woman cl

       Xun went to give the pig to the woman.

    b. 7i- j- meltzan -be j- p'ej na   li Xun -e.
       cp A1 make   io one nc house the Xun cl

       I made a house for Xun.

    c. Ch- a- k- ak' -be.
       icp B2 A1 give io

       I'll give it to you.

The range of thematic roles exhibited by the "third" (i.e., non-agentive, non-theme) argument in these ditransitive clauses includes recipients, benefactives and malefactives, addressees and targets. For the sake of simplicity, I will subsume all of these roles under the general category of *goal*. (7a) and (b) show the basic order of arguments in the clause, the goal preceding the patient/theme. (7c) shows the goal's association with set B agreement, and the lack of an agreement marker for the patient/theme.

In ditransitive clauses, the goal and not the theme behaves like a direct object, both in terms of agreement, as noted above, and in terms of behavior in passive clauses: Only the goal may attain subject status in passive clauses. Aissen's analysis of ditransitives is shown in (8):

(8) *Stratal Diagram for Ditransitives in Tzotzil*
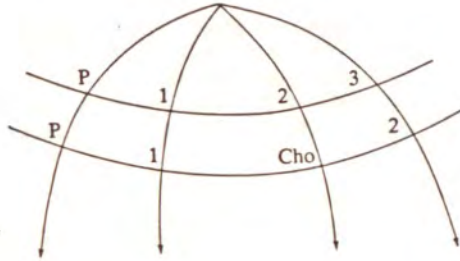
In the initial stratum, the goal is a 3. Aissen proposes that in Tzotzil, 3-to-2 Advancement is obligatory, forcing the initial 2 *en chomage*. The *'-be'* suffix marks the existence of an initial 3 in the clause.

Possessor Ascension clauses in Tzotzil resemble those in Choctaw in that a possessor in the clause incurs agreement on the verb, but differs from them in that the possessive prefix is retained. Two examples are given in (9):

(9) *PA clauses in Tzotzil (p. 126 (1,2))*

Ch- i- s- toyilan -be j- jol.
icp B1 A3 keep lifting io A1 head

He kept lifting my head.

A- mil -b -on jutuk k- ol.
A2 kill io B1sg one A1 child

You killed one of my children.

Note the presence of the *'-be'* suffix in both (9a) and (b). For (9a), Aissen proposes the structure shown in (10):

(10) *Stratal Diagram for (9)*
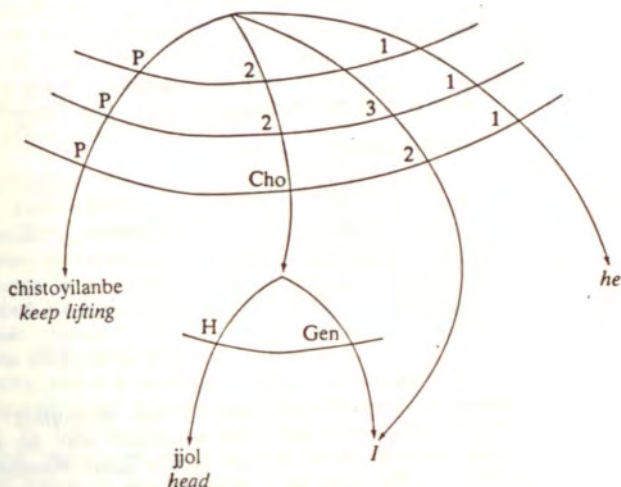
As in Choctaw, the possessor is raised into the main clause as a 3, then by Tzotzil rule, obligatorily advanced to 2, putting the initial 2 *en chomage*.

Finally, there is a constraint on the application of PA that applies to both Choctaw and Tzotzil:

(11) *PA Host Constraints*

        a. *Choctaw:* Only 2-arcs, and 1-arcs in clauses lacking a 2-arc, may host a PA.

        b. *Tzotzil:* Only a 2-arc in a clause also containing a 1-arc may host a PA.

Paraphrasing (11), a pronominal possessor may ascend to become a 3 in the clause to which its nominal phrase belongs, if the nominal phrase is of an appropriate type. Note that these constraints are satisfied in (4) and (10). The Choctaw examples in (12) show that in a PA clause that *a priori* could have two possible interpretations, only the one in which the possessor has ascended from a 2 is permitted.

(12) a. Am-   ofi   -t   chokfi alhpoa lhioli -tok.
     1POSS dog NOM sheep   chase PST

   My dog chased the sheep.

b. Ofi -t   ã-   chokfi alhpoa lhioli -tok.
   dog NOM 1POSS sheep   chase PST

   The dog chased my sheep.

c. Ofi -t   chokfi alhpoa ã-   lhioli -tok.
   dog NOM sheep   1DAT chase PST

   The dog chased my sheep.
   ≠ My dog chased the sheep.

3. Objections to the RG Analyses

In Choctaw, the possessive markers are equivalent to the DAT agreement markers on the verb, normally associated with 3s; after PA, the possessor is a 3 in the main clause, and as such is again associated with DAT agreement. In Tzotzil, the possessive markers are equivalent to the set A affixes, normally associated with 1s; after PA, in which it is claimed that the possessor is promoted to 3, a Tzotzil-specific rule forces another promotion to 2, hence the use of set B agreement affixes for the possessor in PA clauses. Given RG's premise that morphology is in general representative of grammatical relations in a clause, then if PA in the two languages is as parallel as is claimed, then the substantial divergence in the morphological representation of PA needs to be explained. It has been suggested in recent RG literature that nominal phrases may have relational structure much like clauses; e.g., Rosen (1987) proposes that the possessee in a nominal phrase be considered a "noun predicate" bearing both the P and 2 relations, the possessor to bear the 1 relation. This would explain the use of set A affixes to mark possession in Tzotzil, but not the use of DAT affixes in Choctaw. If the morphology of possessive nominal phrases is not a matter of grammatical relations, then the question might be raised as to whether the choice of marking is arbitrary and language-specific.

My second objection is specific to Aissen's analysis of Tzotzil: There is little evidence to support her contention that '3' exists as a distinct grammatical relation in Tzotzil. Its role in her analysis seems to be as a catch-all for all non-agent, non-theme arguments, including possessive ascendees. Since all 3s advance to 2, there are no final 3s, and hence no marking for 3s corresponding to set A for 1s and set B for 2s.

The only morphological evidence Aissen presents in support of the existence of 3s in Tzotzil is the appearance of '-be' in all clauses in which a 3 is purported to appear. '-be' differs from the set A and B prefixes, which vary for person and number, in that it is a suffix and is invariable. Further, while set A and B affixes represent *final* grammatical relations, '-be' indicates the existence of an *initial* 3 in the clause.

I suggest that there is little language-internal support for 3s in Tzotzil

and suspect that Aissen chose 3 for the catch-all relation for cross-linguistic reasons. In Section 5, I propose an alternative analysis for *'-be'* that I feel is better motivated.

A third weakness in the RG approach to PA has to do with the constraints (11) on PA hosts. Is it coincidental that PA seems to favor 2s as hosts in the two languages?[1] Why can't (e.g.) a 3 host a PA? Is there some principled reason or reasons for these constraints, or must they be stipulated, as in the RG approach?

4. The Thematic Hierarchy and Grammatical Linking

Inspired by Heath (1977), I argue in Breen (1988b) that Choctaw pronominal agreement markers are not, as Davies claims, indicative of grammatical relations, but rather mark the thematic roles of pronominal arguments in a clause. My analysis of Choctaw is based on a framework developed by Paul Kiparsky (see, e.g., Kiparsky (1988)) which recognizes a thematic hierarchy much like but more detailed than Heath's. Although opinions differ as to the exact nature and ordering of the thematic roles in this hierarchy, and it is possible that the ordering may differ slightly from language to language, there is some general agreement as to which types of roles are higher in the hierarchy, and which types lower. For example, generally speaking, those roles which ascribe agency and/or sentience to their arguments will be higher in the hierarchy than, say, those ascribing change of state or location. The hierarchy shown in (13) is typical of those proposed for most languages. Ordering within each thematic group is ignored as irrelevant for the purposes of this paper.

(13) *Thematic Hierarchy*
Agent/Cause > Experiencer (several types) > Theme/Patient > Goal/Beneficiary/Receiver > Path/Location

In Kiparsky's framework, the lexical entity for any predicate indicates which thematic roles are required or allowed by the predicate, and which of these are *grammatically* linked (i.e., via case, agreement or word order), and which are *semantically* linked (e.g., via adpositional phrase or "adverbial" case). Those arguments of a predicate which are grammatically linked are called *terms*. The term whose thematic role is highest in the hierarchy is normally subject at surface structure. Given this framework, I propose that the case markers and pronominal agreement affixes serve different purposes in Choctaw. Specifically, the pronominal agreement affixes on the verb are semantic or thematic role markers which indicate that the predicate has assigned a given thematic role to a (normally) unexpressed pronominal argument. In this analysis, then, the pronominal agreement affixes have no direct correlation with grammatical relations.

It is the nominal case markers which represent the grammatical relations of Choctaw to the extent they are represented. A NOM suffix on an argument indicates that it is grammatically linked. Normally for Choctaw, only one argument may be grammatically linked,[2] and this argument may be considered the subject.

Several classes of psychological predicates in Choctaw exhibit two distinct patterns of pronominal agreement markings. In Breen (1988b) I claim

that these alternations in markings are not a matter of grammatical derivation, as proposed by Davies, but rather a matter of homophonous pairs of closely related predicates that differ only in terms of speaker attitude. It follows that Choctaw must have a relatively rich set of *cognitive* thematic roles. Some thematic roles and their associated pronominal agreement markers are shown in the table in (14) (from Breen (1988b)):

(14) *"Regular" Roles*	*Marker*	*"Cognitive" Roles*
Agent	NOM	Experiencer of a **directed** emotion or attitude
Patient/Theme	ACC	Experiencer of a **passive** or **undirected** emotion
Goal/Recipient	DAT	Unwilling or unwitting participant; goal of emotion; **"victim"**.

The lexical entry for a verb will contain, among other things, certain information about its argument structure, including which arguments it takes. obligatory and optional, and how these arguments are linked (i.e., semantically or grammatically). Separate statements may be made for each language concerning. e.g., any special constraints on the number of grammatically linked arguments (terms) a predicate may have. Semantically linked arguments (i.e., non-terms) are indicated with a "□"; terms appear without any prefix. The argument which is available for the subject role (as mentioned above, normally the term with the highest thematic role) will be italicized for ease of identification.

Partial lexical entries for the Choctaw predicates seen above in examples (1) and (2) are given in (15):

(15) *Thematic argument structure for some Choctaw predicates.*
eat < *Agent*, (Patient) >
want$_1$ < *directed experiencer*, theme >
forget$_2$ < *victim, theme* >
hate$_1$ < *directed experiencer*, victim >

Unlike Choctaw, Tzotzil has no case marking to indicate grammatical linking of full NPs. The set A and B agreement markers indicate the grammatical linking of pronominal arguments according to the rules shown in (16):

(16) *Tzotzil Linking Rules*
a. If the highest argument is an agent or experiencer, use the appropriate (for person and number) set A affix(es).
b. *(Default)* For all other *pronominal* arguments, use the appropriate set B affix.
c. *(Constraint)* A maximum of two arguments may be grammatically linked (one via set A affix, one via set B).

To see how these rules are applied, consider the examples in (17):

(17) a.
```
7i-  j-  pet  -tik    lok'el ti  vinik -e.
cp   A1  carry 1plinc away   the man   cl
```
We (inclusive) carried away the man.

b.
```
L-  i-  tal    -otik.
cp  B1  come   1plinc
```
We (inclusive) came.

c.
```
L-  i-  s-  pet   -otik.
cp  B1  A3  carry 1plinc
```
He carried us (inclusive).

The lexical entries for *pet* 'carry' and *tal* 'come' are given in (18):

(18) *Partial Lexical Entries, Tzotzil*
pet 'carry' < agent, patient/theme, (¤ loc) >
tal 'come' < theme >

In (17a) and (c), the agent of 'carry' is associated with a set A affix by rule (16a), and in (17b) and (c), the pronominal theme of 'come' and the pronominal them/patient of 'carry' are associated with set B affixes, by rule (16b).

5. Lexical Rules

While the rules for Choctaw and Tzotzil in the preceding section deal with predicate-argument agreement marking at the clause level, certain morphological processes may affect the argument structure of a predicate before it leaves the lexicon. Passive, for example, is a process, extremely common cross-linguistically, which acts on a predicate with an argument high in the thematic hierarchy (typically agent, sometimes experiencer) by *delinking* this argument, leaving the next highest argument available for whatever linking process is appropriate at the clause level. The rule for passive in Tzotzil might be stated as shown in (19), with an example in (20):

(19) *Tzotzil Passive*
Morphological Change: affix *-at*
Argument Structural Change:
Pred <agent/exp, ... > ⟶ Pred <¤ agent/exp, ... >

(20) a. Ch- a- s- mil.
icp B2 A3 kill

He's going to kill you.

b. Ch- a- mil -at. (*Ch-a-s-mil-at.)
icp B2 kill psv

You're going to be killed.

The predicate argument derivation for (20b) would be as shown in (21):

(21) *Predicate Argument Derivation for 'mil-psv'*
mil <agent, patient>
mil-psv <¤ agent, patient>

The delinking symbol in from of the agent indicates that the agent, if it is present at all, must be semantically linked, e.g., via prepositional phrase. Since the remaining argument in (20b) is a patient, it is associated with a set B affix.

Another class of morphological process, sometimes called applicatives, can be generally characterized as promoting certain types of lower arguments to second position in the hierarchy.[3] An example of an applicative from English is Dative shift, shown in (22) and (23):

(22) *Dative Shift (English)*
a. Morphological Change: none
b. Argument Structure Change:
Pred <*Agent*, Theme, ¤ Goal/Rec > ⟶
Pred <*Agent*, Goal/Rec, (¤)Theme >
c. Application: Optional

(23) a. *Before Dative Shift:*
Frederic sent a letter to Martha.
send <agent, patient/theme, ¤ goal/recipient>
b. *After Dative Shift:*
Frederic sent Martha a letter.
send <agent, goal/recipient, (¤)theme/patient>

I claim that the '*-be*' affix in Tzotzil is such an applicative, promoting any goal-type argument to second position:

(24) *Tzotzil Applicative*
    a. Morphological Change: Affix – *be*
    b. Argument Structural Change:
    Pred <agent, patient/theme, goal> ⟶
    Pred <agent, goal, patient/theme>
    c. Application: Obligatory

This analysis of '-*be*' explains the pronominal agreement markers in (7c): the agent is associated with a set A affix, and the goal, as next in line, with a set B affix. The "Maximum of 2" constraint prevents the patient/theme from also being linked with a set B affix.

Before returning to Possessor Ascension, the question of possessive markers still needs to be addressed. In Choctaw, the possessor is consistently associated with DAT marking, which is typically associated with goal or recipient arguments. Receiving and possession are certainly related concepts, so DAT marking seems intuitively appropriate. Why are possessors marked with set A affixes in Tzotzil? The choices may be arbitrary, or it may be that the act of possession is normally associated with some sort of cognitive ability on the part of the possessor to recognize its relationship to the possessee. In any case, I assume as a working hypothesis that the possessor role belongs to the goal/recipient class of thematic roles.[4]

6. Possessor Ascension in a Linking Grammar Analysis

Given the above theoretical apparatus, PA is statable in general form as shown in (25):

(25) *Possessor Ascension*
    Morphological Change: varies; some agreement marker on predicate.
    Argument Structure Change:
    Pred $<(X), Y^i <poss/goal^i>, ... > \longrightarrow$
    Pred $<(X), Y^i(<poss/goal^i>), goal^i, ... >$
    Constraints: (a) Created or copied goal arg is pronominal.
    (b) (necessary?) $Y > goal$

The argument structure change states that the first or second argument in a predicate argument structure may be either copied or replaced by a clause-level goal argument. The 'i' superscripts indicate the relationship between possessor and possessee; the copy/replacement goal argument retains this relationship with the possessee. The requirement that Y be higher than goal in the thematic hierarchy is assumed to be a universal.

Note that crucially, the clause-level goal copier/replacement immediately follows the Y argument in (25). It is possible that a more general constraint, say, that the host of an argument generation must be of higher rank than the argument generated, might make the constraint (b) unnecessary.

Note also that while the adjacency of the generated argument to its host directly introduces no *syntactic* restrictions on PA, it does introduce a sort of *semantic* subjacency constraint: The host must be of higher rank, and there must be no argument closer to 'goal' than the host. This explains why theme/patients are the preferred hosts of PA, while in Choctaw, an

agent/experiencer may be PA host *provided* there is no theme/patient.

A comment is in order regarding the apparently stricter constraints on PA in Tzotzil. I suspect that Tzotzil's requirement that only patient/themes may host a PA and only then in the presence of an agent/exp in the same clause, may be a reflection of a broader constraint on goal arguments in general, e.g., that goal arguments may only appear in properly ditransitive predications.

As a final Tzotzil example, (26b) shows the semantic argument derivation of (26a), whose predicate shows the successive application of PA, 'be-' Applicative, and Passive:

(26) *Semantic Argument Derivation of a Tzotzil Predicate*

a.

L- a- chik' -b -at t- a- chak -e.
cp B2 burn io psv the A2 ass cl

Your ass was burnt.

b. burn $<$agent, patient^i $<$poss$^i>$ $>$
burn-PA $<$agent, patient^i $<$poss$^i>$, goal$^i>$
burn-PA-be $<$agent, goal^i, patient^i $<$poss$^i>$ $>$
burn-PA-be-psv $<$□ agent, goal^i, patient^i $<$poss$^i>$ $>$

The second line of the derivation in (26b) shows that Tzotzil chooses the 'copy' option in PA, rather than the 'replace' option chosen by Choctaw. Applicative promotes the newly created goal to second position, and passive delinks the agent (which is not expressed in this instance), making the goal the only argument available for grammatical linking, with a set B affix.

To summarize: The Linking Grammar approach makes the claim that PA makes no reference to grammatical relations, as the RG approaches claim, but rather is a semantic argument-creating or copying process that occurs in the lexicon. It suggests answers to some tricky questions concerning choices of possessive markers and constraints on PA hosts that the RG approaches are forced to handle by stipulation.

Footnotes

[1] PA data from other languages was unavailable to me or insufficient to determine whether this preference for theme/patient hosts might be considered a universal, or at least a universal trend. In section 6, I propose some reasons for the trend.

[2] A few agentless predicates permit two linkings; see Breen (1988b) for details.

[3] For a more complete discussion of applicatives, see Breen (1988a).

[4] A complete discussion of thematic roles within the noun phrase would take us too far afield, but note that 'John's portrait' may mean 'that likeness of John', 'that picture which belongs to John', or 'that painting (of someone) that John executed'. In 'John's portrait of Mary by Larry', these roles are spelled out. A thematic hierarchy for roles within the noun phrase paralleling the clause-level hierarchy is probably called for, but to my knowledge it hasn't yet been completely worked out.

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Subject Marking in Manipuri
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1. INTRODUCTION.   Bhat and Ningomba (1986a), claim that the
notion of subject is not a 'feasible concept' in Manipuri.[1] because: (a)
there is no subject verb agreement in Manipuri to clearly indicate the
subjecthood of a given NP and (b) the logical subject is not consistently
marked by the nominative case marker -nə. I will argue that these
conclusions are based on the misanalysis -nə as a case marker and
that -nə can best be analyzed as a marker of focus. This analysis
further exemplifies facts about subject marking in the language:
sentence initial NP's may be marked by the accusative or dative case.
Since the canonical word order is subject-object-verb, it is tempting to
analyze such initial NP's as subjects with quirky case. It will be
argued that nominative case is structurally assigned to subject
position and that such sentence initial NP's may logical subjects but
are not grammatical subjects. To conclude the discussion on subject
marking, the paper also presents a discussion of the distribution of
determiners with phrasal and sentential subjects (and objects):
phrasal determiners are seen to mark proximity and distance whereas
sentential determiners seem to signify the relative time of existence of
a given situation.

2.0 NOMINATIVE CASE MARKING.   In   the   major   linguistic
literature available on Manipuri (Primrose, 1887; Pettigrew, 1912;
Devi, 1979 and Bhat and Ningomba, 1986b), subjects are analyzed as
being marked by the nominative case marker -nə as illustrated in
(1)[2].

1. əy-nə   ma-bu huy-də -gi kəl -l   -i
   I -nom he-acc dog -dat-gen save-perf-nhyp
   'I saved him from the dog'.

However, this analysis of -nə does not account for its distribution and
semantics. First, the occurrence of the marker is always optional. So,
(2) is an acceptable sentence.

2. əy ma-bu huy-də -gi kəl -l -i
    I he -acc dog-dat-gen save-perf-nhyp
    'I saved him from the dog'.

The occurrence of -nə marking on an NP makes it a focused NP: thus in (1), əy is the most salient information offered to the hearer. Conversely, in (2) where the subject is not marked by -nə, no such prominence is given to the subject əy. Furthermore, a focused NP makes the sentence it is in contrastive. In accordance with this, (1) is more accurately glossed as in (1').

1'. It is I who saved him from the dog (while others did nothing.')

The contrastive reading of sentences is based on pragmatic information shared by participants in speech. First, it is presupposed by both speaker and hearer that either: an event has taken place, or a state has been obtained; or a process is in progress. Second, the speaker makes a selection out of a set of choices on the assumption that the hearer is aware that a set of possible choices does exist. Third, by making a choice the speaker asserts that, out of a possible set of choices, his\her choice is the correct one. Without -nə marking, this implied pragmatic information is not available and the sentence gets a pragmatically neutral reading with regard to contrastiveness as in (2). As illustrated in (3), where a quality or condition of a candidate is opposed to qualities or conditions held by a limited set of candidates, the type of contrast obtained is comparative.

3. me -hak-nə thəbək-tə mol -li
    3PP-hon-foc work -dat slow-prog
    'He is a slower worker (than others).'

A second fact not accounted for by the traditional analysis of -nə as nominative marker, is that -nə marking may appear on objects as well as subjects, bringing about the same contrastive reading to the sentence as when subject NP is -nə marked. This is illustrated in (4) where the indirect object nəŋ is marked by -nə and is NP that is focused

4. nga kiyo nəŋ-nə yot   -khə -ro
    fish being you -foc swallow-infr -imp
    '(I command) the fish monster to swallow you.'
    '(I command) the fish monster to swallow you and no one else.'

A final fact about the distribution of -nə that must be accounted for is that there may be more than one -nə marked NP within a clause (in the domain of a single verbal element). This is illustrated in (5,6), where the speaker makes a pair of selections from two sets of possible choices.

5. əy-nə məcu-nə ol   -li
    I -foc color -foc change-prog
    'I changed the color (but not the design).'
6. ma-nə mi -yam -nə kəw-məl -l   -e
    he -foc man-very-foc call -excess-perf-exper
    'He has called people too much.'
    'He is the one who has called people (but not gods) too much.'

In the light of examples such as (1-6), it seems incorrect to characterize -nə as the nominative marker: it contributes pragmatic information to the sentence that is not typical to the function of case markers; in (7-8) where -nə marks both subject and object, -nə cannot be considered be a case marker unless we want to think of both subject and object as having the same case. An equally striking example of the non-case marking function of -nə is (4) where, although the subject is unmarked and the indirect object takes -nə marking, there is no confusion between the semantic function of the arguments. Furthermore, in cases where -nə marks objects, it cannot be a signal of nominative case since this would result in a conflict between the accusative case of the object and the case signalled by the marker. Finally, as -nə marking is totally optional, it cannot be the only mechanism whereby nominative case is assigned. Thus, I analyze -nə as being a pragmatic marker of focus and not the nominative case marker.   Given that subjects are not morphologically marked for nominative case, I conclude that nominative case must be structurally assigned in Manipuri. Since in all structures the head occurs in the end, I assume a sentential structure as in Figure 1.
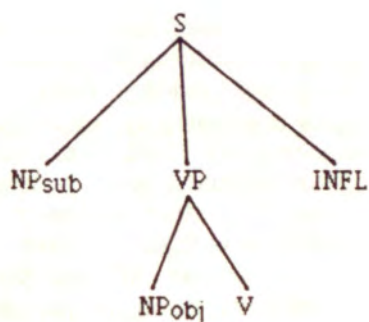
Figure 1: Canonical Sentence Structure in Manipuri

The particular syntactic environment where nominative case is assigned is: [___ V+INFL]. However, nominative case is not assigned when tense in INFL is not present: for example there is obligatory NP movement from the subject position of infinitive clauses as in the raising to subject construction in (7).

7. jon maypak-kə -də-bə mal -li
   John win   -ass-dat-inf seem-pres
   'John seems to be winning'

(7) will have the structure shown in Figure 2.
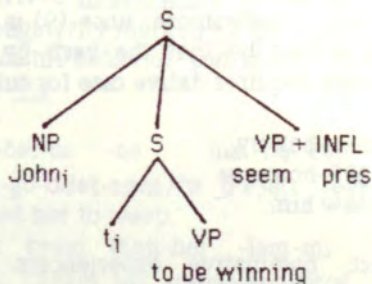
Figure 2: Structure of a Raising Construction

As the infinite verb cannot assign nominative case, the subject of the infinite must move to the higher clause in order to get case. This triggers raising and yields: [John$_i$ [t$_i$ maypakkədəbə] malli]. Nominative case is assigned by tense when INFL governs the subject NP in the following way: INFL must c-command the subject NP; and the subject NP is contained on the maximal X-bar projection of INFL. Case Theory places a strict adjacency requirement between case assigner and assignee in English. However, since in Manipuri the verb always intervenes between INFL and the subject (see Figure 1.), the two elements will never be adjacent to each other and adjacency does not prove to be a necessary structural condition for nominative case assignment.

2.1 LOGICAL AND GRAMMATICAL SUBJECTS. Subjects then are those NP's that are in a structural position to receive nominative case through assignment from INFL. Since subjects receive structural case, and there is no nominative case marker, they will not be morphologically case marked. Consider the possible subjecthood of sentence initial NP's which occur with dative marking (8).

8. tombə -də mə-hak uy
   Tombə-dat 3PP-hon see
   'Tomba saw him.' ('He was seen
   by Tomba.')

Tomba cannot be analyzed as being the syntactic subject since if this dative argument were in subject position to which nominative case is structurally assigned, the sentence would be ungrammatical due a conflict of case. Furthermore, since (9) is a possible sentence of the language, it cannot be that the verb uy is lexically marked as a predicate which requires dative case for subjects.

9. tombə mə -hak uy
   Tombə 3PP-hon saw
   'Tomba saw him.'

In fact, nominative experiencers are opposed to dative experiencers: a dative experiencer has no control over the action it undergoes whereas a nominative experiencer has potential control over such action. In (8), Tomba has something imposed on his field of vision and is forced into sighting somebody. The demotion of

Tomba to the status of non-subject is used to indicate his lack of control over what he perceives. Additionally, the logical subjecthood of this dative-experiencer is accorded focus through the inverted word order. In (9) however, seeing is an action the subject had some control over.

Sentence initial NP's may also occur with accusative marking as illustrated in (10,11)

10. əy-bu -nə barton   təw-wi
    I -acc-foc invitation get -pres
    I was invited (but not others).
11. ma -bu iro -bə tam -bi
    3PP-acc swim-inf teach-ben
    'He was taught to swim.'

As subject position is assigned nominative case, the initial accusative NP cannot be in subject position as this would result in a conflict between the nominative case assigned and the morphologically marked accusative case. Although there is no passive morphology in this language, such constructions are best analyzed as passive type constructions where the grammatical subject does not appear on the surface but is understood.

2.2. SUBJECTS IN CAUSATIVE CONSTRUCTIONS.   Varied   case marking can also be observed on sentence initial NP's in causative constructions. Causative verbs are derived from noncausative counterparts by the suffixation of the causative marker -həl , so from hətləmmi 'killed' is derived həthəlləmmi 'caused to kill'. Subjects of causative verbs are obligatorily marked by the agentive marker -nə [4] Thus in (12) the subject 'his behavior' and in (13) the subject 'I', must occur with the marker -nə.

12. ma-gi me -rəm-čet-tu -nə   ma -bu kəp -həl -ləm-mi
    he-gen mode-way-go-ddet-agen/*ø 3PP-acc weep-cause-seq-prog
    'His behavior caused her to weep.'
13. əy-nə   ram-bu syam thaŋ-həl -ləm-mi
    I-agen/*ø Ram-acc Shyam lift -cause-seq-prog
    'I made Ram lift Shyam.'

The subjects of embedded clauses in causative constructions may be nominative (14), accusative (15,13), or dative (16) in case.

14. čawb -nə   ŋaŋ -du   nəw -həl -ləm-mi
    Cawb -agen child-ddet white-cause-seq-pres
    'Chaoba made the child to be white'
15. əy-nə   tombə -bu   i   -maŋ -də caŋta -həl -ləm-mi
    I   -agen Tomba-acc 1PP-front-dat shame-caus-seq-pres
    'I made Tomba get ashamed before me.'
16. mə -pa   -nə   mə -ča   -də layrik pa -həl   -li
    3PP-father-agen 3PP-child-dat book   read-cause-pres
    Father made the son read the book.
    (Father made the book to be read by the son.')

Such subjects are marked nominative when they appear in an
intransitive clause. Subjects are marked accusative when they appear
in ditransitive clauses. In such cases the embedded subject can be
thought of as being raised to the object position of the matrix clause.
Such a construction contrasts with sentences where the embedded
subject appears in the dative case. Here the subject is demoted to the
status of a non-subject argument and is another example of a dative
experiencer which is the recipient or goal of the action of the agent.
As reflected by the second translation given, the dative in these
instances can only be considered to be marginally agentive in carrying
out the specified action.

3. **DETERMINERS.**   The position classes of suffixes that can occur
after a noun in Manipuri are: (a) determiners (such as -si 'this', -du
'that'); (b) case markers (such as -bu 'accusative', -də 'dative', -nə
'agentive'); (c) focus markers (such as -nə 'focus'); and (d) exclusive or
inclusive enclitics (such as -su 'also', -di 'even', -bu 'not NP') in that
order. As illustrated in (17,18) the determiner -si signifies proximity
and the determiner -du signifies distance.

17. layrik əŋaŋbə məri-si   əy-gi   -ni
    book   red   four -pdet I -gen-cop
    'These four red books are mine.'
18. layrik əŋaŋbə məri-du   əy-gi   -ni
    book   red   four-ddet I -gen-cop
    'Those four red books are mine.'

When these determiners mark sentential subjects or objects, they may
signify meanings that are not primarily deictic. -du marking signifies

that the sentential phrase refers to a particular event in time (19); -si marking signifies that the sentential phrase refers to an ongoing or atemporal situation (20). With the absence of either of these markers it is ambiguous when the situation referred to came into existence. Thus (21) may have one of two glosses, the first refers to a particular event in time whereas the second refers to situation that exists at all times.[5]

19. ma-nə išing thək -pə -du əy-nə kham-mi
    he-foc water drink-rel-ddet I -foc stop -pres
    'I prevent him from drinking water.'
20. ma-nə čət-pə -si əy-nə čən-bə -dəgi hen -nə thu-y
    he-foc go -rel-pdet I -foc run-rel-from more-adv fast-present
    'His walking is faster than my running.'
21. nəŋ-nə ŋaŋ -bə -di mi tay
    you -foc speak-rel-ex man listen
    'People hear you speaking.'
    'People hear that you are speaking.'

Devi (1979) notes a peculiar distribution of the proximate determiner -si: the subjects of stative verbs are always marked by -si whereas the subjects of verbs of cognition, sensation and process are not marked. Sentential subjects (and sentential objects) are seen to follow these same marking patterns. She does not attempt an explanation for this distribution of -si. As shown in (22), where -du and not -si marking on a sentential subject occurs with a stative main verb, counterexamples to her generalization can be found.

22. əy-nə tum -mi -bə-du phəy
    I -foc sleep-pres-rel -ddet good
    'It is good that I am sleeping'
    'That I am sleeping is good.'

Devi's observation of the peculiar skewing of -si marking with stative verbs is explained by the fact that -si signifies the atemporal nature of a situation and states of being are typically atemporal.
    Devi also notes that sentential subjects or objects that occur with main verbs in the future tense must be subordinated by the quotative haybə (literally meaning ' to say') (23).

23. əy čak ča -gə -ni   haybə ma khəŋ-ŋi
    I rice eat-fut-cop QUOT he know-pres
    'He knows that I will eat.'

As is illustrated in (24,25), when the main verb is in future tense, the sentential subject or object cannot be marked by -bə.

*24. əy čak ča -gə-ni -bə ma khəŋ-ŋi
     I rice eat-fut-cop-rel he know-pres
     'He knows that I will eat.'
 *25. əy čak čət-gə -ni -bə ma khəŋ-ŋi
     I rice go -fut-cop-rel he know-pres
     'He knows that I will go.'

Recall that -si/-du indicate at what point in time a particular situation has come into existence; the lack of such marking indicates that the situation may have occurred at a particular moment in time or may have always existed. Given this, it is predictable that events that have yet to occur cannot take such marking. There are no examples in Devi's data showing if sentential subjects or objects can or cannot be marked by -si or -du but this analysis predicts that such marking would be impossible.

4. **CONCLUSION**.   In this paper I have shown that in Manipuri, the notion of subject can be established when nominative case is seen to be structurally assigned. It has been seen that sentence initial NP's with dative or accusative case are not in canonical subject position; instead such case marking on logical subjects is used to contrast them pragmatically with grammatical subjects in nominative case. I have also presented data showing that determiners not only mark proximity and distance but may also signify the time that a given situation came into existence.

NOTES

[1]Manipuri is a Tibeto-Burman language of the Kuki-Chin Group. The dominant Manipuri speaking population of about a million speakers is concentrated in the central valley of Manipur state which is located in Northeastern India. Small pockets of speakers are present in Assam, Bangladesh and Burma. The data presented in this paper is taken from my own notes and tapes gathered during

fieldwork carried out in Delhi in 1984, Manipur State and New Delhi in 1986 and 1987. Data is also taken from (Primrose, 1887; Pettigrew, 1912; Devi, 1979 and Bhat and Ningomba, 1986a, 1986b).

[2]The examples are arranged in the following manner: line 1 gives a broad phonetic transcription with the morpheme divisions; line 2 provides glosses for the morphemes (list of abbreviations given below); and line 3 and 4 give possible free translations. These are the conventions for abbreviations used:

Row 1: gives abbreviation
Row 2: identifies function of the morpheme
Row 3: gives form of the morpheme

adv	adverb	-nə
acc	accusative	-pu
agen	agentive	-nə
ass	associative	-kə
ben	benefactive	-bi
caus	causative	-həl
cop	copula	-ni
dat	dative	-tə
ddet	determiner signifying distance	-du
exper	experiental evidential	-e
foc	focus	-nə
fut	future	-kə
gen	genitive	-ki
hon	honorific	-hak
imp	imperative	-u
infr	inferential	-khə
nhyp	nonhypothetical enclitic	-i
NP	noun phrase, noun	
nom	nominative case	-nə
pdet	determiner signifying proximity	-si
perf	perfect aspect	-lə
pres	present tense	-i
prog	progressive aspect	-li
QUOT	quotative	-hay
rel	relative	-pə
seq	sequential	-ləm
1PP	first person possessive	i-

| 2PP | second person possessive | nə- |
| 3PP | third person possessive | mə- |

3An exhaustive discussion of experiencer subjects in Manipuri can be found in Chelliah, 1988.

4The agentive -nə is distinguished from the focus marker -nə in that it is obligatory and does not bring a meaning difference to the sentence it is used in.

5See Hanks, 1984 for discussion of similar use of deictics in Yucatec Maya.

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Coherence Relation Assignment
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The reader of a text builds a cognitive picture or mental model of the situation described in it (van Dijk and Kintsch, 1983, Johnson-Laird, 1983, Sanford and Garrod, 1981, Graesser and Clark, 1985). Many factors contribute to this model, and their interactions are complex. The text itself, its genre, and the reader's expectation that the text will be causally connected, or coherent, all contribute to the interpretation. In addition, when the text does not directly state coherence relations, the reader draws upon his knowledge of the ways in which events are typically causally connected in the actual world. This paper will review the contributions of the text, reader inference and world knowledge to the cognitive discourse representation structure (CDRS) built by the reader of a commentary text. In the commentary genre, frequently found in newspapers and magazines, one event is reported and the remainder of the text describes the importance of the event in the view of the author and of various commentators. After examining the contributions of various levels of grammar in determining the CDRS, the paper will illustrate the complexities of the interactions among the levels. It will offer a computational algorithm for constructing the CDRS.

The algorithm is the result of over a year of empirical research on discourse relations in a 6000-word corpus of commentary text from the *Wall Street Journal*. A coherence relation was assigned to each clause in the corpus. The syntactic and semantic properties of each clause were encoded. The correlations between these encodings form the basis of the algorithm.

The CDRS is an enhanced Discourse Representation Structure (DRS) (Kamp, 1981, Asher, 1987). A DRS is designed to correctly handle anaphoric and tense relations in discourse. A simple DRS for (1) is shown in (2), where the anaphoric relationship between *John* and *he* is resolved.

(1)   John invested heavily. He made a huge profit.

It is assumed that as the text is read, predicates are added to the DRS to reflect inferences about the causal and organizational structure of the text. For example, if the text is (1), the corresponding CDRS after discourse coherence assignment is (3), where two discourse inferences are added to what the text says directly.

(2)

u_1,e_1,u_2,u_3,e_2
john(u_1)
e_1 invest(u_1)
heavily(e_1)
profit(u_3)
e_2 make(u_2,u_3)
huge(u_3)
$u_2 = u_1$

(3)

u_1,e_1,u_2,u_3,e_2
$r_1 <$ now
john(u_1)
e_1 invest(u_1)
$e_1 \subseteq r_1$
heavily(e_1)
profit(u_3)
e_2 make(u_2,u_3)
huge(u_3)
$r_1 < r_2$
$e_2 \subseteq r_2$
$u_2 = u_1$

The first discourse inference is temporal. The event of profiting (e_2) is inferred to have taken place after the event of investing (e_1), which is reflected in the temporal equations. In the equations, the r_i are reference time intervals, as in Partee, 1984. The equations show that the reference time intervals in which the events occurred were temporally ordered ($r_1 < r_2$). The second discourse inference is causal, and is asserted in the predicate goal(e_1,e_2). Such inferences are guesses which may be revised by subsequent text. If (1) continues as in (4), the predicate goal(e_1,e_2) must be retracted.

(4)   ...despite his intention to take losses.

A number of coherence relations have been proposed by Hobbs(1985), Mann and Thompson (1987) and others. Coherence accounts for the fact that while (1) is an acceptable text, (5) is incoherent and unacceptable as it stands because the reader cannot build any plausible cognitive model of the situation it describes.

(5)   John invested heavily. He loves Mary.

After reviewing the discourse literature, we selected 19 coherence relations for this research. Coherence relations also hold between larger segments of text, and these segments form a hierarchy structure (Grosz and Sidner, 1986, Reichman, 1985).

1. Levels of Grammar Contributing to Coherence

1.1. Cue phrases

Discourse cue phrases, syntax, compositional semantics and naïve semantics (or conceptual knowledge), all contribute to discourse coherence. Cue phrases directly state coherence relations (Cohen, 1984), as in (6), where the cues *in order to* (**goal**), *because* (**cause**), and *then* (**sequence**) are illustrated. Cues either decisively select one coherence relation, or greatly reduce the possibilities.

(6)   (e_1) John invested heavily in order (e_2) to make a profit.
         goal(e_1,e_2)
         (e_1) John went to the musical twice because (e_2)he loved the score.
         cause(e_1,e_2)
         (e_1) John went to the musical. (e_2) Then he had a late dinner.
         sequence(e_1,e_2)

Similarly, certain specific lexical items are highly indicative of certain coherence relations. A sentence with the verb *contrast* or *oppose* indicates a **contrast** relation, a sentence with *show* an **import** relation. A sentence with the adjective *similar* indicates a **parallel** relation, and a sentence with *good* an **evaluation** relation.

1.2. Syntax

Certain syntactic structures decisively indicate a particular coherence relation, and others only suggest one. The comparative construction is a clear indicator of a **contrast** relation, a generic sentence of a **generalization** relation, and an appositive construction of a **description** clause. Verb ellipsis suggests a **parallel** or **contrast** relation. Relative clauses and past and present participials are usually **description** clauses, as in (7a), but can be **situation** clauses. A relative clause is a **situation** clause if it contains a time or place adverbial, as in (7b).

(7)   a. Mr. Levine, who traded in stocks and commodities, pleaded guilty.
         description(e_1,e_2)
         b. Mr. Levine, who (e_1) sat in the witness stand, (e_2) pleaded

guilty.
situation_place(e_1,e_2)

Past participle clauses are **description** clauses unless they contain the verb *give*, or time or place adverbials.

(8)   (e_1) Given Levine's transgressions, (e_2) the outcome is clear.
evidence(e_1,e_2)
Levine, (e_1) charged last May, (e_2) took the stand.
situation_time(e_1,e_2)
Levine, dressed in a grey suit, took the stand.
description(e_1,u_1)

Present participles are **description** clauses, as in (9a). unless they have an agentive subject, as in (9b)

(9)   a. The rosewood table (e_1) standing in the corner (e_2) held a vase.
        Levine, (e_1) muttering to himself, (e_2) took the stand.
        situation_activity(e_1,e_2)

A number of structures which are often thought to be indicative of coherence relations were found to be useless because they cooccur with many coherence relations. Examples are the passive which was thought to indicate that a clause was not a **reported event**, and main clause which was thought to indicate that it was a **reported event**.

1.3. Semantics

Tense alone does not conclusively indicate the coherence function of a clause. This was discovered in detailed analysis of the corpus (see Dahlgren, 1987). First of all. all types of clauses occur in the simple past tense. Secondly, although simple present excludes **reported events** (and sequenced events in narrative, unless the entire narrative is in the simple present), it does not distinguish among the other relations. In the following examples two clauses in the simple past tenses can be related as **description, import, comment** or **cause**.

(e_1) Levine was indicted yesterday. (s_1) He is a Wall Street broker
description(s_1,e_1)
(e_1) The Levine case (s_1) reflects corruption on Wall Street
import(s_1,e_1)
Experts (c_2) say (e_1) the Levine case will stop insider trading.
comment(c_2,c_1)
(e_1) John eats steak. (e_2) Mary eats veal.
contrast(e_1,e_2).

(e_1) Levine is greedy, and (e_2) he broke the law for money.
cause(e_1,e_2).

However, the temporal relation between two clauses can preclude certain coherence relations between them. Assume two clauses can be either temporally ordered or overlapping. In order for the relations cause(e_1,e_2), enablement(e_1,e_2), or goal(e_1,e_2) to obtain between the clauses, e_1 must precede e_2, when the clauses are telic (see below), as illustrated in (10). (Notice that the order of appearance of the clauses is irrelevant.)

(10)   (e_1) John invested heavily. (e_2) He made a huge profit.
         goal(e_1,e_2).
         (e_1) John invested heavily. (e_2) He had made a huge profit.
         *goal(e_1,e_2).

Also, e_1 preceding e_2 favors **elaboration, evidence** and **comment**. In order for e_1 to describe a **generalization, qualification** or **situation_place** for e_2, e_1 must overlap e_2. **Situation_activity** clauses must report events preceding or overlapping in time with that of the related clause, as illustrated in (11).

(11) e_1 John was a stockbroker, e_2 when he made a huge profit.
         situation_activity(e_1,e_2).
         e_1 John was a stockbroker. e_2 He is making a killing.
         *situation_activity(e_1,e_2).

In order to assign temporal relations, naive semantic (or world) knowledge is sometimes required. In (1), knowledge that a consequence of investing is profiting must be used along with the sequence of two simple past tenses, to infer that the profiting followed the investing in time. The algorithm to be described here uses naive semantic knowledge built into the Kind Types system (Dahlgren and McDowell, 1986a, 1986b, McDowell and Dahlgren, 1987, Dahlgren, 1988). An example is in (12), which shows the lexical entry for *invest* in English translation. The verb entry is based upon typical and inherent implications of investing.

(12)   Investing is typically lucrative, is accomplished with money,
         and has as consequence profiting. Inherently, sentients do the
         investing with the goal of making money.

Aspect is more decisive than tense in coherence relation assignment. Aspect refers to the temporal perspective, the continuity and completion of a clause. In the Kind Types system the aspect of a verb is listed as part of its lexical entry. But context affects aspect, as illustrated by (13) where (a) is telic, while (b) and (c) are activity clauses.

(13)   a. John pushed the cart under the shed.
         b. John pushed the cart under a blue sky.

c. John pushed the cart.

Accordingly, the aspect of the entire clause must be computed (Moens and Steedman, 1987), taking into account factors such as progressive verb marking and quantified or unspecified subject or object. A clause reporting an activity with no indicated terminus is clause-activity (John ran); a clause reporting a change of state with a terminus is clause-telic (John built the house); a clause reporting a state is clause-stative (John was building a house).

A **situation_activity** clause is one which cannot be shown to be **description, import,** or **comment,** for which no causal relation to the target can be proven, is temporally before the target and is clause_stative or clause_activity, as shown in (14).

(14)   (e_1) John went into the study. (e_2) He paid the bills.
clause_telic(e_1), sequence(e_1,e_2)
(e_1) John was in the study. (e_2) He heard the phone ring.
clause_stative(e_1), situation_place(e_1,e_2)
(e_1) John worked in the study. (e_2) He paid the bills.
clause_activity(e_1), situation_place(e_1,e_2)

1.4. Naive Semantics

A final factor which influences discourse coherence inferences is naive semantics (or world knowledge). Where two clauses have no discourse cues, no syntactic structures favoring particular coherence relations, and tense and aspect relations consistent with several coherence relations, naive semantics is used to infer causal structure. This is the situation which obtains in (1), where we have two simple past tense clauses, both clause_telic, both main clauses with no discourse cues. These facts are consistent with **sequence, cause, goal, enablement,** or **elaboration. Import** and **comment** are also possible. The naive semantic information associated with *invest* drives the inference that goal(e_1,e_2).

2. Interactions of Levels of Grammar

The complex interactions of these factors in determining coherence are illustrated by the connective *when*. A *when*-clause can relate to the main clause as **situation_time, situation_activity, enablement, cause,** or **elaboration**. If the *when*-clause has aspect clause-activity or clause-stative, *when* means "at the same time as". The *when*-clause is **situation_time** or **situation_activity** relative to the main clause as in (15), but only if it can be interpreted as temporally overlapping the main clause.

(15)   When John was (*had been, *will be)   a stockbroker, he in-

vested heavily in wheat.

When John was (had been, *will be)   working on Wall Street, he invested heavily in wheat.

If the *when*-clause has aspect clause_telic , *when* can mean "before", "at the same time as" or "after". For telic clauses the favored relations are **cause, goal, enablement,elaboration** and **sequence**. In this case, the temporal relationships between the clauses and naive semantic information are used to assign coherence. The three examples below are taken from Moens and Steedman, 1987). In (16), the *when*-clause event occurs after the main clause event, narrowing the possible relationships. Naive semantic information concerning *build* and *architect* are used to infer an **enablement** relation.

(16) (e_1) When they built the 39th St. bridge, (e_2) a local architect (had drawn) drew up the plans.
enablement(e_2,e_1)

In (17), the two clauses overlap in time (by naive semantic knowledge of *build*, which implies using materials). Of the preferred relations for telic clauses with *when*, the only one with overlapping time is **elaboration**.

(17) (e_1) When they built the 39th St. bridge, (e_2) they used the best materials.
elaboration(e_2,e_1)

In (18), naive semantic knowledge is used to infer that the *when*-clause event occurs before the main-clause event, and that a bridge could solve traffic problems, so that a **cause** relation between the clauses is plausible.

(18) (e_1) When they built the 39th St. bridge, (e_2) they solved most of their traffic problems.
cause(e_1,e_2)

Naive semantic information must always be consulted for *when*-clauses. If no relationship is established by naive semantics, the effect of the *when*-clause is determined by temporal and aspectual relations between the clauses. Temporal relations of past-perfect/past, past/past, or past/future select a reading for *when* of "at the same time as" or "just after", as in (19).

(19)   When John had eaten dinner, he listened to the news.
When John graduated, his father died.
When John ate dinner, he listened to the news.
When John graduates, his father will die.

A past/past-perfect sequence results in a "just before" reading for *when*. In all cases, the relation of the *when*-clause to the main clause is **situation_time**.

(20)   When John graduated, his father had died.

3. Discourse Coherence Algorithm

The coherence algorithm, shown in Table I, considers all the clauses in a segment in relation to each other. The present algorithm does not consider segmentation and hierarchy in text structure. The information the algorithm uses is as follows:

1. Source syntax - Syntactic properties of the source clause, including appositive, relative clause, passive, participial, comparative construction, ellipsis, identity copula, and generic sentences
2. Source and Target Connectives - cue phrases (such as *because* and adverbs such as *similarly*)
3. Temporal Relation - temporal relation between the clauses
4. Source and Target Aspect - aspect of the source and target clauses
5. Source and Target Verb
6. Source Semantics - presence of time or place adverbial, conditional, interrogative, and agentiveness of surface subject

The algorithm first tries syntactic tests. It determines whether the source clause is descriptive, which is the case when the clause is an identity copula, a relative clause (unless the clause contains a time or place adverbial, making it a **situation** clause), a past participle (unless it contains the verb *give*, making it a **situation_activity** clause), or a present participle (unless the subject is agentive). Then it looks for clear syntactic or lexical indications of **contrast, parallel** and **generalization**.

Next the algorithm tests for connectives and cue phrases. The presence of one of these selects a coherence relation decisively, unless the connective is *when, as* or *while*. The latter two connectives can indicate **contrast** or **parallel**, but these are caught by the above syntactic tests. *when* is truly ambiguous, as described above. The ambiguity can be resolved using the algorithm as if there had been no connective. That this works is an important result. It shows that the algorithm is quite powerful, and justifies it because the algorithm succeeds even when a connective is ignored. Apparently *when* merely indicates that two clauses directly cohere in some way, without specifying which way.

Table I. Discourse Coherence Algorithm

disc_rel(Temporal_rel.Source_aspect,Target_aspect,
    Source_connective,Target_connective,Source_verb,Target_verb,
    Source_syntax,Source_semantics,Rel) if
    syntactic_tests(Temporal_rel,Source_aspect.Source_verb,
        Source_syntax,Source_semantics,Rel) or
    connectives(Source_connective,Target_connective,Rel) or
    comment_tests(Source_verb,comment) or
    import_tests(Source_v,Source_semantics,import) or
    causal_tests(Source_v,Target_v,Rel) if
    (not(Source_aspect = stative and Target_aspect = stative) and
     Temporal_rel = source before target) or
    situation_activity_tests(Temporal_relation,Source_aspect,Rel)
    sequence_test(sequence) if
     (Source_aspect = telic and
      Target_aspect = telic
      Temporal_rel = source before target).

After connectives, the algorithm tests for **comment** clauses. These are clauses which introduce the belief world of someone different from the speaker and are indicated by non-performative verbs of saying such as *say*, *claim* and by the emotion verbs such as *fear*. Such clauses can be in any tense, and have any temporal relation to the target clause. Once the possibility of **comment** clause is eliminated, the algorithm tests for **import** clause. **Import** clauses are indicated by the semantic features conditional or interrogative clause, or by the presence of a m modal in the verb phrase. The only other cases of clauses with modals are **description** clauses, which are eliminated as possibilities at this point in the algorithm. Another test for **import** clause is a temporal relation of target before source, or overlapping source, and the presence of one of several import verbs or adjectives such as *indicate, represent, mean* or *important*.

If none of these tests succeeds, three possibilities remain: a causal or inclusion relationship between source and target, **situation activity** or **reported event** (**sequence** in narrative). First the algorithm considers the case of two temporally ordered clauses, at least one of which is telic. It tries to prove a causal or inclusion relation between the clauses using common-sense knowledge. This was exemplified in (1) where the goal relationship can be inferred from the naive semantic knowledge in (12). The procedure looks for a **cause, goal, enable, generalization** or **elaboration** coherence relation between the source and target clause.

If this fails, aspect tests are invoked. If the source clause is in the perfect or has clause_aspect of activity or stative, the clause is

situation_activity. Finally, the algorithm checks whether the two clauses are temporally ordered, and are both telic. In that case they form a sequence of **reported events** (in the commentary genre). This rules out the case where one is stative, and is related causally, as **situation_activity**, or is unrelated to the other, as in (21). Only two telics, as in (22), can be a sequence of **reported events** (or a narrative sequence).

(21)   Levine was guilty. He left the courtroom. (He was sentenced.)

(22)   The jury found Levine guilty. He left the courtroom and held a press conference.

If none of these succeeds, the two clauses are unrelated.

3.1. Illustration

We apply the algorithm to a complex sample text to illustrate its functioning. In the text, given below, each event or state is indicated with a reference marker underneath the verb.

Levine, charged with SEC violations last May,
e_1
was convicted and sentenced here yesterday.
e_2 e_3
Levine had engaged in extensive insider trading.
e_4
He was greedy and wanted more money.
s_1 s_2
Levine's light sentence reflects an attempt by the court
to reward cooperation in such cases.
s_3
The judge said that Levine's cooperation had influenced him in his favor.
e_5
Critics argued that light sentences will result in more violations.
e_6
The coherence relations among the events and states
in the text are as follows:

reported event(e_2)
sequence(e_3,e_2)
situation_activity(e_1,e_2).
situation_activity(e_4,e_2).
cause(s_1,e_4)
goal(s_2,e_4)

import(s_3,e_2)
comment(e_5,e_2)
comment(e_6,e_2)

The first clause to be considered will be the main clause in relation to the participial clause. Referring to the algorithm in Table I, we see that the main clause will designate a **reported event** because it will fail the syntactic tests (it is not a relative clause, appositive, nor any of the syntactic structures the algorithm looks for). There is no connective, no verb of saying for the **comment** test, and no modal, conditional, interrogative or import verb for the **import** test. When the algorithm tries in the causal tests to prove it is a **reported event** (as this is a commentary genre text), it will succeed. Next, the algorithm considers e_3 in relation to e_2. The causal tests will show that e_3 is a **reported event** in the same way as for e_2. The **sequence** test will shows that *convicted* and *sentenced* are two temporally ordered telics, and so determine sequence(e_3,e_2). Next, the algorithm considers e_1 in relation to e_2. Here tests succeed on the source clause (e_1). Since it is a participial it must be either **description** or **situation**. As it contains a time adverbial, it is designated **situation**. Notice that the time adverbial in the main clause does not result in the same assignment.

Next the algorithm considers (e_4) in relation to (e_2). Reported events are always tried first as targets in commentary, because commentary revolves around them. Considering (e_4) in relation to (e_2) syntactic tests, connectives, **comment** tests and **import** tests all fail. There is only an indirect relation between breaking the law and being convicted, so causal tests fail. Now the algorithm tries **situation_activity**, and succeeds because the clause is in the perfect. Next the algorithm tries (s_1) in relation to (e_2). All tests up through **import** fail. Now it tries causal tests and finds that greed can cause people to break the law, so it assigns cause(s_1,e_2). Similarly, it finds that a typical goal of breaking the law is making money, so it assigns goal(s_2,e_4). Turning to (s_3) in relation to (e_2), the syntactic, connective and **comment** tests fail. The **import** test succeeds because (s_3) overlaps (e_2) in *reflect* is an import verb. Finally, the two **comment** clauses (e_5) and (e_6) are discovered because they fail the syntactic and connective tests, and they contain non-performative verbs of saying.

4. Conclusion

Discourse coherence can be represented by adding predicates to a DRS to form a Cognitive DRS. These predicates can be heuristically assigned based upon information from all levels of grammar---syntax, cue phrases, lexical items, formal semantics and naive semantics. Naive semantic information is needed to solve problems of lexical and syntactic disambiguation, so the algorithm does not require any more information

than must be present in any case to account for language understanding. The algorithm is surprisingly simple. A number of factors which had previously been considered important in coherence, particularly tense and certain syntactic constructions, were found to be irrelevant. The algorithm described here correctly assigns the coherence relations apparent in 6000 words of commentary text. Further work will investigate discourse segments and hierarchy structure in discourse.

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PALATALIZATION AS AN AUTOSEGMENT IN TERALFENE FLEMISH

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Most autosegmental accounts have considered features that have a natural capacity for spreading over several segments, such as features involved in tone, nasalization, or vowel harmony. Palatalization spreading has not been predicted by autosegmental phonology (Goldsmith 1976), even though a palatalizing tier has been posited in the non-concatenative morphology of Chaha (McCarthy 1983). In this paper, I will examine the evidence for this kind of autosegmental spreading in the Flemish dialect of Teralfene, a village of the Dender valley on the western edge of the Province of Brabant, Belgium.[1]

In the Teralfene dialect, there is a set of palatalized or palatal coronal consonants [t^y, d^y, š, ž, n^y, l^y], (henceforth referred to as palatalized sounds) with a peculiar distribution since they occur only after certain vowels, and only as clusters of two or more palatalized members.[2]

Before discussing the conditioning of palatalization, it is necessary to describe the Teralfene vowel system, which is given in (1):

(1) Short vowels: Long vowels: Diphthongs:

[i] /i/	[u] /u/	[i:] /ii/	[u^c:] /uu/	[i^ə] /iə/	[u^ə] /uə/
		[e:] /ee/	[o^c:] /oo/		
[ɛ] /e/ [ə] /ə/ [ɔ] /o/			[ɔ^c:] /ɔɔ/	[ɛ^ə] /eə/ [ɔ^ə] /oə/
[æ] /æ/	[ɑ] /a/	[æ:] /ææ/ [ɑ:] /aa/		[ɒ^ə] /aə/

In the above chart, both phonetic values and a more abstract taxonomic phonemic interpretation are given. The following comments are in order. This dialect has no front rounded vowels; as in Standard Dutch, the status of /ə/ as a phoneme is not clear, and it might be analyzable as an unstressed allophone of /e/; three vowel heights are distinguished in the short vowel and diphthong series, but

four vowel heights exist in the back long vowel series; the superscript [ᶜ] in the back long vowel series indicates that they are unrounded and slightly centralized; all the diphthongs are centering, but the shwa often assimilates in backness and roundness to a preceding high vowel, so that /iə/ is often [iᴱ], and /uə/ is often [uᴐ].

The clusters of palatalized sounds referred to above can be derived from the corresponding simple (apico-alveolar) coronals by a <u>Sound Pattern of English</u> (Chomsky and Halle 1968) type of rule of Cluster Palatalization (CP), which would have to account for several complex sets of data. As seen in set (2), CP causes any sequence or cluster of more than one coronal consonant to be palatalized, (unless that cluster is the biconsonantal /st/), if the preceding vowel is either a <u>short front</u> or a <u>short high</u> vowel.

(2) Surface: Underlying: Gloss:
     [vælʸtʸ]   /væld/   'field'
     [pænʸš]   /pæns/   'sausage'
     [vænʸštər]   /vænstər/   'window'
     [smɛlʸtʸ]   /smelt/   '(it/he/she) melts'
     [smɛlʸtʸlʸ]   /smeltən/   'to melt'
     [blɛnʸtʸ]   /blend/   'blind'
     [kinʸtʸ]   /kind/   'child'
     [vrinʸtʸškap]   /vrindskap/   'friendship'
     [wilʸtʸ]   /wild/   'wild'
     [bulʸtʸ]   /bult/   'hump'
     [munʸtʸ]   /munt/   'mint'

Examples without coronal cluster palatalization are:

(3) Surface: Underlying: Gloss:
     [bɛst]   /best/   'best'
     [kist]   /kist/   '(he/she) kisses'
     [kɑnt]   /kant/   'side'
     [ɔnt]   /ond/   'dog'

It will be noted that palatalization can spread from a cluster to

an inflectional suffix such as /-ən/ 'Infinitive', as in the form glossed 'to melt', or to a derivational suffix such as /-skap/ '-ship', as in the form glossed 'friendship'. As seen in the forms glossed 'best', and '(he/she) kisses' in (3), /st/ is not palatalized, but the cluster /ns/ preceding /t/ is palatalizable (cf. 'window' in (2), 'tenth' in (6), and 'brownest' in (7)).

Some differences between surface and underlying representations in (2) and (3) that are not relevant to my discussion of palatalization are briefly noted here. As in German and Dutch, there is a rule of final obstruent devoicing in Teralfene Flemish, (cf. the forms glossed as 'field', 'blind', 'child', 'wild', and 'dog'). There is a rule, to be ordered before CP, forming the syllabic sonorants [n̩] and [l̩] from /ən/ and /əl/ when these occur after coronals, with assimilation of [n̩] to [l̩] if there is a preceding /l/, as shown in the form glossed 'to melt'. Due to constraints on place, I will not present my arguments for considering forms with /ən/ to be the necessary underlying forms.

For the purpose of clarification, the rule of intervocalic cluster simplification (ICS), given in (4) and to be ordered after CP, is also needed. Examples are given in (5).

(4)

$$\begin{bmatrix} + \text{ coronal} \\ - \text{ continuant} \\ + \text{ voice} \end{bmatrix} \rightarrow \emptyset \Bigg/ \begin{bmatrix} + \text{ consonantal} \\ + \text{ sonorant} \\ + \text{ coronal} \end{bmatrix} \underline{\quad\quad} \begin{bmatrix} - \text{ consonantal} \\ + \text{ syllabic} \end{bmatrix}$$
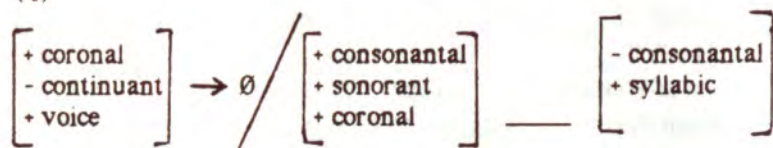
(5)   Surface: Underlying: Gloss:
      [kælʸər]   /kældər/   'basement'
      [væl̩ʸ:] (< [væl̩ʸl̩ʸ]) /vældən/   'fields'
      [blɛnʸə]   /blendə/   'blind (attributive)'
      [kinʸərn̩]   /kindərən/   'children'
      [wilʸə]   /wildə/   'wild (attributive)'

A rule of CP also would have to account for the fact that there is palatalization of coronal clusters after any (underlying) long vowel, as in (6), and after an (underlying) diphthong, as in (7). It is necessary to mention underlying forms since there exists in the Teralfene

dialect, as well as in most Flemish dialects, a general rule shortening long vowels and diphthongs before consonant clusters (Devos and Taeldeman (1974), Devos, Ryckeboer, and Taeldeman (1979:87-89)). In order to avoid setting up CP as a global rule, it is necessary to order the shortening rule after CP. As seen in the form glossed 'fetches' in (6), even non-high and back vowels such as /ɔɔ/, shortened to [ɔ], can therefore cause palatalization.

(6) Surface: Underlying: Gloss:
     [ɔːḻ]   (< [ɔːl̠ʲ])   /ɔɔlən/   'to fetch'
     [ɔlʲtʲ]   /ɔɔlt/   '(he/she/it) fetches'
     [speːḻ] (< [speːl̠ʲ])   /speelən/   'to play'
     [spɛlʲtʲ]   /speelt/   '(he/she/it) plays'
     [tiːn]   /tiin/   'ten'
     [tinʲšn̩] (< [tinʲštn̩])   /tiinstən/   'tenth'

(7) Surface: Underlying: Gloss:
     [vɒᵊl]   /vaəl/   'file (tool)'
     [vɑlʲšl̩ʲš]   /vaəlsəls/   'filings'
     [biᵊn]   /biən/   'leg'
     [binʲtʲn̩ʲ]   /biəntyən/   'leg (diminutive)'
     [brɔᵊn]   /broən/   'brown'
     [brɔnʲšt]   /broənst/   'brownest'
     [skuᵊn]   /skuən/   'beautiful'
     [skunʲš]   /skuəns/   'something beautiful'

As a result, there can be surface minimal pairs involving palatalized versus non-palatalized clusters. These are quite rare, however, since the two pairs in (8) are the only ones occurring in my data.

(8)　　Surface:　　　Underlying:　　Gloss:
　　　　[mɔnʸtʸ]　　　/mɔɔnd/　　　'month'
　vs.　[mɔnt]　　　　/mond/　　　　'mouth'
　　　　[spɔnʸš]　　　/spɔɔnsk/[3]　'Spanish'
　vs.　[spɔns]　　　　/spons/　　　'sponge'

Although it is possible to account for the data with an iterative palatalization rule, I will argue that postulating a palatalizing autosegment is preferable for two reasons.

(a)　In order to account for the data, a segmental rule of CP would have to be extremely complex. It would involve palatalization of the first element of certain coronal clusters after certain short vowels, but after all long vowels and diphthongs, and then an iterative application of assimilation to the other elements of the cluster.

(b)　There exist diminutive suffixes that are associated with a palatalizing autosegment on a morphological tier; when these suffixes are attached to a noun stem containing a coronal cluster, the autosegment palatalizes this cluster, regardless of the vowel preceding it, as seen in (9).[4] I assume that a palatalizing autosegment (henceforth called P) can accompany the diminutive suffix /-kən/ in the lexicon.

(9)　　Underlying:　　Surface:　　　Gloss:
　　(from　/mandə/　　[manə]　　　'basket':)

　　　　　　P　　　　　　P
　　　　　　|　　　　　　↑
　　　　/mandəkən/　[manʸəkən]　'basket (diminutive)'

　　(from　/ond/　　　[ɔnt]　　　'dog':)

　　　　　　P　　　　　　P
　　　　　　|　　　　　　↑
　　　　/ondəkən/　[ɔnʸəkən]　'dog (diminutive)'

Similarly, I will assume that the autosegment P is lexically attached to words containing a short high or a short front vowel, a long vowel, or a diphthong. Thus, the feature P accompanies the item in the lexicon. One then needs to ask to which segment of the word P gets attached. If one is able to provide evidence for a precise locus of

attachment, the case for the existence of the autosegment P itself would be somewhat strengthened.

The most obvious locus is of course the first element of the cluster, which is the place where it is phonetically realized and from which it appears to spread from left to right. However, I will argue that P is actually attached to a vocalic element preceding this cluster. The evidence for this type of attachment of P is provided by a rather abstract analysis of the long vowels and diphthongs.

It appears that in cases of underlying diphthongs shortened by following non-coronal sequences, there can be spreading of this autosegment P to the short vowel resulting from a shortened diphthong, and that this spreading is phonetically realized as fronting of this vowel. This can be explained by assuming that P is lexically attached to the first mora of a long vowel, but to the second mora of a diphthong, i.e. [ə]. After a long vowel is shortened (i.e. the second mora is deleted), palatalization association lines can spread to a following coronal cluster, (but only to a coronal cluster), as in the form glossed 'month' in (10).[5]

(10)　　　　　Underlying:　Surface:　　Gloss:
　　　　　　　　P　　　　　　P
　　　　　　　　|　　　　　　|
　(from　/slɔɔpən/　　[slɔ:pən]　　'to sleep':)
　　　　　　　　P　　　　　　P
　　　　　　　　|　　　　　　|
　　　　　　/slɔɔpt/　　　[slɔpt]　　'(he/she/it) sleeps'
　　　　　　　　P　　　　　　P
　　　　　　　　|　　　　　　⋰
　　　　　　/mɔɔnd/　　　[mɔnʸtʸ]　　'month'

After a diphthong is shortened (i.e. the second mora is deleted), the autosegment is not lexically attached to anything, but compensates for this in two possible ways.

The first way is by spreading to a coronal immediately following the vowel, even when no palatalizable coronal sequence is present, as in (11). Thus, even though /st/ in the form glossed 'fist' is a coronal sequence, it is not a palatalizable one, and therefore only its first element is palatalized, resulting in [št].

(11)   Underlying: Surface: Gloss:

      P   P

(from   /vaəs/   [vɒ^əs]   'screw':)

      P   P

    /vaəskən/   [vɑškən]   'screw (diminutive)'
        *[væskən], *[væškən]

      P   P

(from   /koəsk/   [kɔ^əs]⁶   'cleaning':)

      P   P

    /koəskən/   [kɔškən]   'to clean'
        *[keskən], *[keškən]

      P   P

    /voəst/   [vɔšt]   'fist'
        *[vɛst], *[vɛšt]

The second way, used when there is no following coronal at all, is by spreading to the preconsonantal vowel, thereby fronting it, as in (12).[7]

(12) Underlying: Surface: Gloss:

           P   P

(from /kaəkən/ [kʋᵊkən] 'to look':)

           P   P

        /kaəkt/ [kækt] '(he/she/it) looks'

                  *[kɑkt]

          P   P

(from /kroəpən/ [krɔᵊpən] 'to crawl':)

          P   P

        /kroəpt/ [krœpt] › [krɛpt] '(he/she/it) crawls'

                  *[krɔpt]

In [krɛpt] 'crawls', there actually is fronting of [ɔ], since in this dialect underlying front rounded vowels become unrounded; in closely related dialects that allow front rounded vowels, such as some varieties of the Aalst dialect (Colinet 1896:7), and the Brussels dialect (Mazereel 1931:71), the expected form [krœpt] occurs.[8]

Thus, I am proposing that a theory of autosegmental attachment and spreading should predict that in some languages, (a) there is a distinction between lexical attachment and spreading; (b) that a lexically attached autosegment may spread only when it can, and thus does not necessarily surface phonetically; and (c) that when a lexical autosegment has been detached, spreading must occur, forcing the feature to be phonetically apparent.

Admittedly, my distinction between lexical attachment and spreading results in a very abstract analysis. Spreading is rather straightforward since it refers to the fact that the autosegment must spread and be phonetically realized. In this manner, P is phonetically realized in the following cluster, as in (6) and (7), on a single following consonant, as in (11), or on the vowel itself, as in (12). More problematic is my assumption that an autosegment need not phonetically influence a form it is lexically attached to, and that in this particular dialect, there are cases where it does not. Examples are the

forms glossed 'to sleep', 'sleeps' in (10). This situation could be avoided by postulating a morpheme structure condition allowing P to attach to certain vowels, but only before certain (palatalizable) consonant clusters. The problem with this morpheme structure constraint is that it will look as complicated and unnatural as a segmental and iterative rule of CP. I think it is preferable to adopt the more abstract analysis, which posits that P is lexically attached to all short high or front vowels, the first mora of long vowels, and the second mora of diphthongs, and tentatively assumes that, at least in some languages, there is some kind of equivalence between the preservation of lexical attachment without obligatory phonetic realization of a feature, and lexical deattachment with obligatory phonetic realization of a feature.

NOTES

[1]I worked on the Teralfene dialect because I had access to several competent informants from there, but the facts described here occur in most of the dialects of the west of the Province of Brabant, as well as in the east of the adjacent province of East Flanders (Devos, Ryckeboer, and Taeldeman 1979:10-101). I am grateful for the help of two native speakers of the Teralfene dialect consulted in 1978: Jozef de Reuse, my father, (1926-1980), and Guy Sonck (born in 1958). I also wish to thank John Kingston, John McCarthy, and Anthony Woodbury for their comments on earlier versions of this paper, and Larry Hyman for his comments on the version presented at WECOL, October, 1988.

[2]Palatalized sounds not in clusters occur only in loanwords such as [fɑmilʸə] 'family', [šɑl] 'shawl, scarf', [žəžɛf] 'Joseph', or are easily shown to be derivable from underlying clusters, as shown in the examples in (5).

[3]As shown by the attributive adjective form [spɔnškəl there is a rule deleting word-final /k/ after /s/.

[4]Note that ICS has applied to the surface forms of (9).

[5]In these and the following sets of examples,

P
| indicates lexical attachment, and indicates spreading.

[6]In this form, underlying /k/ is deleted by a rule referred to in footnote 3.

[7]It is most likely that there is an etymological connection between this fronting, (and maybe also the palatalizations described in this paper), and the phenomenon of umlaut. So one can compare German laufen 'to run' läuft '(he/she/it) runs', with the Teralfene cognates with the same meaning /luəpən/ [luᵊpᵊn], /lept/ [lɛpt] (presumably lowered from the *[lipt] (< *[lüpt]) predicted-by my analysis). Since fronting in the Teralfene dialect happens to occur only with diphthongs before certain clusters, the need for an analysis in terms of umlaut does not impose itself in a synchronic account.

[8]Front rounded vowels occurring in loanwords from French or Dutch are unrounded in the Teralfene dialect.

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A METRICAL ANALYSIS OF THE LILLOOET STRESS SYSTEM [*]

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1. Introduction

Lillooet is a Northern Interior Salish language spoken in British Columbia. In polysyllabic Lillooet words, primary stress (normally found initially) is mobile and alternating: it can move to a later syllable if suffixes and enclitics are added:[1]

(1) xʷítəns- 'to whistle at'

    3 syllables: xʷítəns-k-an (1S-3S Ind.)
    4 syllables: xʷìtəns-wít-k-an (1S-3P Ind.)
    5 syllables: xʷìtəns-túmi(n)-ɬk-an (1S-2S Ind.)
    6 syllables: xʷìtəns-tùmuɬ-k-áḷap (2P-1S Ind.)

Main stress appears on the rightmost full vowel that is an even number of syllables from the leftmost full vowel. However, even if it is an even number of syllables from the initial full vowel, a final full vowel does not display main stress. Hence, polysyllabic words with only full vowels and an even number of syllables exhibit penultimate main stress and like words with an odd number of syllables exhibit antepenultimate main stress. Full vowels refer to /a a i i u u/ and are abbreviated as A and weak vowels refer to /ə ə/ and are abbreviated E, following van Eijk (1985). Weak vowels in Lillooet cannot accept stress.

2. Previous Work on Lillooet Stress

Van Eijk (1985) provides an extensive analysis of Lillooet phonology in the framework of classical structuralism. In his description of the stress system, van Eijk states that in polysyllabic words, only one syllable is stressed: that is, only one syllable has primary stress; he does not discuss or transcribe secondary stress. Van Eijk uses the term "syllabifier" for any vowel and for any consonant that functions as a syllable with regard to stress.

Van Eijk describes three types of rules which govern the movement of stress:

(2)

    (1) rules that involve full vowels known as "full syllabifiers";

(2) rules that involve weak vowels and certain consonants known as "weak syllabifiers"; and

(3) rules that involve full vowels that always attract stress known as "strong syllabifiers."

Van Eijk (1981:88) formulates the following general stress rule:

(3)

1. The counting base for the distribution of the stress is
   a. the (last) strong syllabifier in a word, or, if there is no strong syllabifier,
   b. the first full syllabifier, or, if there is no full syllablifier,
   c. the first weak syllabifier.
2. From this base the stress moves two syllabifiers at a time, as suffixes or enclitics are added, as long as
   a. it does not fall on the last syllabifier in a word, except when the last syllabifier is also the only full syllabifier (here it may move also one syllable);
   b. it does not fall on a weak syllabifier (where it would, the weak syllabifier is ignored).

An important aspect of van Eijk's lengthy description is that he states that it is not only the vowels but also the number and the type of consonants that are important in determining stress. The data presented here suggest that vowel quality determines stress placement, irrespective of the consonantal makeup of the word.

3. Generalizations and Data

3.1. Generalizations

From a review of van Eijk's (1988) descriptive work on verbal paradigms in Lillooet, as well as insights from van Eijk (1985) and Bates (1983), three major generalizations can be drawn:

(4)

1) There is a tendency for initial stress, but primary stress works its way from left to right.
2) Alternating secondary stress plays a crucial role in an adequate description of Lillooet stress; the initial syllable plays an important role in the behavior of secondary stress. This secondary stress, however, has few surface phonetic correlates, and serves primarily to distinguish syllables on which main stress may fall from those syllables which are inert with regard to the stress system.
3) Weak vowels do not receive stress.

The first generalization above is drawn by noting the tendency of alternating secondary stress to fall, in all cases, on the initial syllable (except, as noted earlier, if a weak vowel is in initial position as weak vowels cannot

accept stress). From this point, secondary stress falls on every other sylla-
ble that follows. As no word final stress occurs in Lillooet (other than when
forced by weak vowels), the last alternating syllable receives primary
stress (hence, if there is an even number of syllables, primary stress will be
penultimate, and if there an odd number of syllables, primary stress will be
antepenultimate). It is, at this point, valid to make the assertion that this
stress pattern is dependent on the amount of syllablic peaks or nuclei in a
word.

The second generalization is drawn by noting that primary stress tends
to fall in a position which facilitates (enough) secondary stress to have the
alternating stress fall on the initial syllable. This is important as it estab-
lishes not only the role of secondary stress but also the fact that primary
stress falls in a position of alternation regardless of penultimate or antep-
enultimate placement.

The third generalization is drawn by noting the predictable way stress
moves when a weak vowel occurs in the position where stress would nor-
mally occur. Weak vowels can not accommodate stress in Lillooet. When a
weak vowel occurs in the position where a full vowel would receive stress
(either primary or secondary), the syllabic peak or nucleus is ignored (that
is, if a five syllable word has a weak vowel occurring in antepenultimate
position where a full vowel would receive primary stress, that syllable is
ignored and the word is treated as if it were a four syllable word). Weak
vowels count for purposes of syllable counting, but may not actually
receive stress.

These generalizations illustrate the importance of vowel quality in Lil-
looet. It is vital to assign vowel quality in Lillooet as these vowels serve as
the counting bases in stress assignment, as illustrated by the data below:

(5) Vowel Quality

    x"ítəns-k-an (3 syllables)
     A E   A
    x"ìtəns-wít-k-an (4 syllables)
     A E   A   A
    x"ìtəns-túmi(n)-łk-an (5 syllables)
     A E   A A   A
    x"ìtəns-tùmuł-k-áĺap (6 syllables)
     A E   A A   A A

The following data are drawn from van Eijk (1988), and are organized with
regard to the number of syllables in forms from four verbal paradigms.
Nominal paradigms display furthur stress characteristics which will not be
discussed here (cf. van Eijk, 1985).

3.2. Two syllable words

When a disyllabic word contains only full vowels, penultimate stress
obtains:

(6) CÁCAC[2]

cún-ɬk-an	'to tell, order'(1S-3S Ind.)
cún-c-k-ax"	'to tell, order'(2S-1S Ind.)

Penultimate stress is also characteristic of CACEC verbs. However, when the first vowel is weak, and the second vowel full, stress appears on the second:

(7) CECÁC

s-təq-(n)án	'to touch something'(1S-3S Fact.)
təq-n-áx"	'to touch something'(2S-3S F./S.)

Final stress occurs in this set because the initial vowels are weak; hence, stress falls accordingly on the full vowel. This illustrates the first generalization, that there is a tendency for initial stress and the third generalization: weak vowels reject stress.

3.3 Three syllable words

(8) CÁCACAC

The data below illustrate trisyllabic words with all full vowels:

cún-it-as	'to tell, order'(3P-3SP F./S./I.)
cúɬ-uñ-ɬkan	'to point at'(1S-3S Ind.)

Here, antepenultimate primary stress occurs illustrating the tendency for initial stress and supporting the full/weak vowel distinction by contrasting with the following data.

(9) CECECÁC

təq-ən-ɬkáx"	'to touch something'(2S-3S Ind.)
təq-ən-c-áx"	'to touch something'(2S-1S F./S.)

Final stress occurs in this set because the weak vowels fall in a position where stress is predicted to occur; accordingly, stress must fall on the first strong vowel. In (10), penultimate stress falls on the leftmost strong vowel:

(10) CECÁCAC

təq-n-áḷap	'to touch something'(2P-1S F./S.)
təq-n-ít-as	'to touch something'(3P-3SP Fact.)

As in (9), stress falls on the first leftmost strong vowel; this is evidence for the generalization that there is a tendency to move toward some degree of initial stress. The data in (11) are like that of (8):

(11) CÁCECAC

x"ítəns-k-an	'to whistle at'(1S-3S Ind.)

xʷítəns-k-axʷ   'to whistle at'(2S-3S Ind.)

As the weak vowels do not occur in a position to affect stress, these examples follow the stress pattern of 3 syllable words consisting of all strong vowels.

3.4 Four syllable words

The data below illustrate four syllable words with full vowels:

(12) CÀCACÁCAC

    cùɬ-uṅ-c-áḷap   'to point at'(2P-1S F./S.)
    cùɬ-uṅ-áḷap   'to point at'(2P-3S F./S.)

Here, penultimate primary stress occurs with secondary stress falling on the the initial syllable; if it were antepenultimate stress, it would leave the initial syllable stressless but Lillooet exhibits a tendency for some degree of stress initially. The data in (13) support the point that weak vowels count for purposes of syllable counting, but may not actually receive stress:

(13) CECECÁCAC

    təq-ən-cín-an   'to touch something'(1S-3S F./S.)
    təq-ən-wít-an   'to touch something'(1S-3P F./S.)

Penultimate primary stress occurs in a similar manner to (12), except that in this set the inherent inability of weak vowels to accept stress is displayed, as no initial secondary stress occurs. Following the pattern of stress in (12) is that of (14):

(14) CÀCECÁCAC

    xʷìtəns-túmx-as   'to whistle at'(3S-1S Fact.)
    xʷìtəns-twít-as   'to whistle at'(3P-3SP Fact.)

Penultimate primary stress and alternating secondary stress occurs in this set; note that here, the weak vowels do not occur in a position where they could affect stress.

3.5 Five syllable words

When a pentasyllabic word contains only full vowels, antepenultimate primary stress with alternating secondary stress initially is obtained:

(15) CÀCACÁCACAC

    cùɬ-uṅ-táni-ɬkan   'to point at'(1S-3P Ind.)
    cùɬ-uṅ-túmuɬ-kaxʷ   'to point at'(2S-1P Ind.)

The examples in (15) are a good illustration of the alternating nature of Lillooet stress and can stand in contrast with (16):

(16) CECECÁCACAC

təq-ən-túmuɬ-axʷ	'to touch something'(2S-1P F./S.)
təq-ən-wít-aɬap	'to touch something'(2P-3P F./S.)

Here antepenultimate primary stress occurs as in (16) but there is nő initial secondary alternating stress because of the weak vowel placement. The data in (17) follows that of (15):

(17) CÀCECÁCACAC

xʷìtəns-túmi(n)-ɬk-an	'to whistle at'(1S-2S Ind.)
xʷìtəns-túmuɬ-k-an	'to whistle at'(1S-2P Ind.)

Antepenultimate primary stress and alternating secondary stress occurs; here, again, the weak vowels are not in a position to affect stress.

3.6 Six syllable words

The data in (18) and (19) illustrate the alternating nature of Lillooet stress:

(18) CÀCACÀCACÁCAC

cùn-tam-àɬap-ás-wit	'to tell, order'(3P-2P F./S./I.)
cùɬ-uṅ-tùmuɬ-káɬap	'to point at'(2P-1P Ind.)

(19) CÀCECÀCACÁCAC

xʷìtəns-tùmih-ás-wit	'to whistle at'(3P-2S Fact.)
xʷìtəns-tùmul-ít-as	'to whistle at'(3P-1P Fact.)

Both sets have penultimate primary stress and initial alternating secondary stress; the weak vowels are not in a position to affect stress as they are in (20):

(20) CECECÀCACÁCAC

təq-ən-tùmuɬ-káɬap	'to touch something'(2P-1P Ind.)
təq-ən-tùmuɬ-áɬap	'to touch something'(2P-1P F./S.)

Penultimate primary stress and alternating secondary stress occur here but there is no initial secondary stress because of the initial weak vowels. The point to be drawn from this data is that a nucleus projection of vowel quality is vital. Once vowel quality has been established, metrical rules can be constructed to account for the stress tendencies outlined above.

4. A Metrical Analysis

4.1. The Rules

Based on the above generalizations, I propose the following metrical rules; given in the formalism of Hayes (1981):

(21)

(1) On the nucleus projection, project the quality of the vowel (A or E),

(2) From the leftmost A,

(a) Going from L-->R, construct binary, quantity-sensitive, left-dominant feet (Main Stress Rule [MSR]), where S may not dominate E.

(b) Final Foot Deletion (FFD): Remove a final, nonbranching foot.

(i) F-->∅/ ⌣]word
    ‖

(c) Make a right-dominant Word Tree.

(3) Stray syllable adjunction (SSA): Adjoin a stray syllable as a weak sister to the Word Tree.

As a condition on (2bi), the Final Foot Deletion rule may not delete the only strong foot in a word.

The following derivations illustrate the working mechanisms of these metrical rules. These examples will support the Final Foot Deletion rule over an extrametricality rule which would make the last foot extrametrical, as proposed in Bates (1983). The support stems from certain cases in which it is necessary to have a final strong foot. If an extrametricality rule were in place, it would not be able to account for these final strong feet. The derivations will follow the form of section 3, discussing 2, 3, 4, 5 and 6 syllable words in turn.

4.2 Two syllable words

In disyllablic words, like those in (6), the stress rules in (21) create the following structure:

(22)

```
cún-an                    ('to tell, order' 1S-3S F./S.)
 A  A                     Nucleus Projection
 S  W                     Main Stress Rule
 \__/
                          Word Tree
```
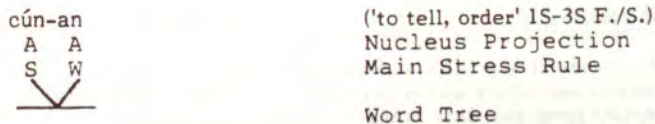
Here the Main Stress Rule has created a binary tree. In the following disyllable example, like those in (7), the stress rules have created the following structure:

(23)
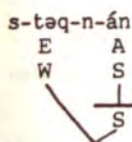
```
s-təq-n-án                    ('to touch something' 1S-2S Fact.)
  E     A                     Nucleus Projection
  W     S
        |                     Degenerate Foot (MSR)
       S                      Word Tree
                              Stray Syllable Adjunction
```

Here, as the Final Foot Deletion rule cannot delete the only strong foot in the word, a degenerate foot created by the Main Stress Rule is preserved and the weak vowel is adjoined by Stray Syllable Adjunction to the Word Tree.

4.3 Three syllable words

In this 3 syllable example, like those in (8), the stress rules have created the following structure:

(24)
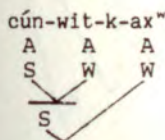
```
cún-wit-k-ax"                 ('to tell, order' 2S-3P Ind.)
 A    A    A                  Nucleus Projection
 S    W    W                  Main Stress Rule
                              Final Foot Deletion
 S                            Word Tree
                              Stray Syllable Adjunction
```

Here, as no more binary feet can be created by the Main Stress Rule, the final non-branching foot is removed by the Final Foot Deletion rule and is adjoined to the Word Tree by Stray Syllable Adjunction. In the following example, like those in (10), the stress rules have created the following structure:

(25)
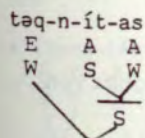
```
təq-n-ít-as                   ('to touch something' 3P-3SP F./S./I.)
 E    A   A                   Nucleus Projection
 W    S   W                   Main Stress Rule

        S                     Word Tree
                              Stray Syllable Adjunction
```

From the leftmost A (strong vowel), a binary foot is created and the remaining weak vowel is adjoined as a weak sister to the Word Tree. In the next example, like those in (9), the stress rules have created the following structure:

(26)

təq-ən-c-ɫkáxʷ   ('to touch something' 2S-3S Ind.)
E E   A   Nucleus Projection
W W   S
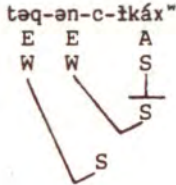
           S   Word Tree
                Degenerate Foot (MSR)
      S   Stray Syllable Adjunction

As only one strong vowel is projected, a degenerate foot is created by the
Main Stress Rule and the weak vowels are adjoined to the Word Tree by
Stray Syllable Adjunction.

4.4 Four syllable words

In this 4 syllable example, like those in (12), the stress rules have cre-
ated the following structure:

(27)

cùɫ-un-ɫkáĺap   ('to point at' 2P-3S Ind.)
A A   A A   Nucleus Projection
S W   S W   Main Stress Rule

   W   S   Word Tree

The Main Stress Rule creates binary, quantity-sensitive, left-dominant feet
with a right dominant Word Tree. In (28), like those in (13), the stress rules
have created the following structure:

(28)
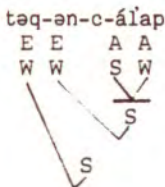
təq-ən-c-áĺap   ('to touch something' 2P-1S Ind.)
E E   A A   Nucleus Projection
W W   S W   Main Stress Rule

           S   Word Tree
                Stray Syllable Adjunction

      S

Here, the Main Stress Rule creates a binary foot from the leftmost A
(strong vowel); and the remaining weak vowels are adjoined as weak sisters
to the Word Tree by Stray Syllable Adjunction.

4.5 Five syllable words

The behavior of (15) falls out of the analysis with no further statements, but (16) deserves some comment:

(29)

Derivation Stage 1:

```
təq-ən-túmuɫ-ax"            ('to touch something' 2S-1P F./S.)
  E E   A A   A             Nucleus Projection
        S W   W             Main Stress Rule
         \_/  |
          V
```

Derivation Stage 2:

```
təq-ən-túmuɫ-ax"            ('to touch something' 2S-1P F./S.)
  E E   A A   A             Nucleus Projection
  W W   S W   W             Main Stress Rule
   \  \   \_/  /            Final Foot Deletion
    \  \   S  /
     \   \ S /
      \ S  \_/              Word Tree
       \  /                 Stray Syllable Adjunction
        V
```
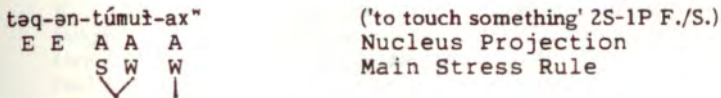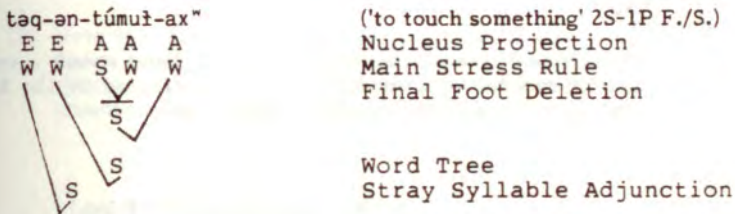
This example, given in two stages, illustrates the order of the foot building rules. Here, the Main Stress Rule creates a binary foot from the leftmost A; since no more binary feet can be created, the final foot that does not branch is removed by the Final Foot Deletion rule. As well, as a E (weak vowel) is projected where a A would take stress, these weak vowels are adjoined as weak sisters to the Word Tree by Stray Syllable Adjunction. The pentasyllablic example in (17) is a further illustration of the application of Final Foot Deletion:

(30)

```
x"ìtəns-tán-ih-an          ('to whistle at' 1S-3P F./S.)
  A E   A   A   A          Nucleus Projection
  S W   S   W   W          Main Stress Rule
   \_/   \  \  /
    W     \  S /           Final Foot Deletion
     \   /  \ /            Word Tree
      \ S   /
       \   /               Stray Syllable Adjunction
        S
        \_/
```
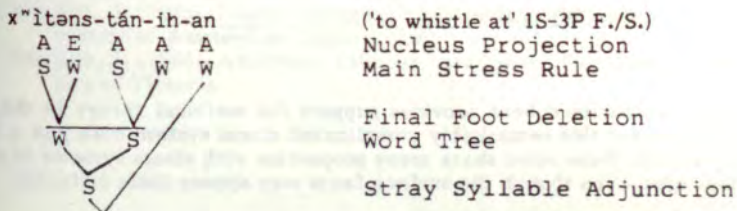
Here, the Main Stress Rule creates binary, quantity-sensitive, left-dominant feet; as no more binary feet can be created, the final foot that

does not branch is removed by the Final Foot Deletion rule and its syllable is adjoined as a weak sister to the Word Tree.

4.6 Six syllable words

It should be clear by now that words with an even number of syllables (cf.18-20) have a straightforward analysis in this framework. No Final Foot Deletion is required, since the final foot branches.

(31)
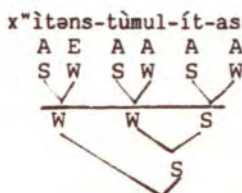
```
xʷìtəns-tùmul-ít-as          ('to whistle at' 3P-1P F./S.I.)
 A  E   A A   A   A           Nucleus Projection
 S  W   S W   S   W           Main Stress Rule
  \ /    \ /   \ /
   W      W     S              Word Tree
    \      \   /
     \      \ /
      \      S
       \    /
        \  /
         S
```

This is a good example of the alternating nature of Lillooet stress; a series of binary, quantity-sensitive, left-dominant feet are created by the Main Stress Rule, and we can see a right-dominant Word Tree.

(32)
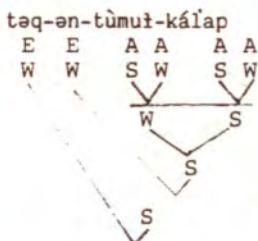
```
təq-ən-tùmuɫ-káɫap           ('to touch something' 2P-1P Ind.)
 E   E   A A   A A            Nucleus Projection
 W   W   S W   S W            Main Stress Rule
          \ /   \ /
           W     S            Word Tree
            \   /
             \ /
              S               Stray Syllable Adjunction
             /
            S
```

Here, the Main Stress Rule creates binary feet from the leftmost A; and the remaining weak vowels are adjoined as weak sisters to the Word Tree by Stray Syllable Adjunction.

5. Conclusion

The analysis outlined here provides support for metrical theory in that it can account for this remarkably complicated stress system with just a few rules and that these rules share many properties with stress systems in other languages, even though the surface facts may appear quite different.

Notes

*   I am indebted to Dr. Jan van Eijk, University of Victoria, for his insightful comments during the discussion of the paper and Dr. Dawn Bates, University of Victoria, in reading the paper in manuscript and helping to sharpen the presentation. Neither person, of course, is responsible for any shortcomings in the final product.

[1] For representational purposes the abbreviations in the parentheses stand for S = Singular, P = Plural, 1 = first person, 2 = second person, 3 = third person, Ind. = Indicative, Fact. = Factual, Subj. = Subjunctive, F./I. = Factual/Subjunctive, F./S./I. = Factual/Subjunctive/Indicative. Subject markers precede object markers in the abbreviations. Indicative forms are used as full predictations with an objective mood. Factual forms are used only in subordinate clauses. Subjunctive forms are mainly used as full (independent) predications but are also used in subordinate clauses. Often factual and subjunctive paradigms, as well as indicative paradigms coincide in conjugation (see van Eijk, 1985).

[2] Note that for representational purposes, C can equal C_0^1. This is evidence which supports the generalization that it is the nucleus of the syllable which is instrumental in determining stress as the number of consonants in the coda do not affect the placement of stress.

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The grammatical basis of null pronouns:
evidence from nonthematic subjects

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The ultimate goal of this paper is to address
directly the major theme of this collection of papers
from the 1988 WECOL conference: whether language (or
certain aspects of it) are better analyzed at the
discourse or sentence level. To make my point, I have
chosen a topic -- null pronouns -- for which there are
competing claims. By examining one aspect of null
pronoun phenomena, I will show that only the sentence
level offers the possibility of an adequate explana-
tion. I begin by presenting a simple and cross-
linguistically valid analysis of nonthematic subjects
in the Government-Binding (GB) framework.

By nonthematic subjects, I mean those structural
subjects which have no reference, e.g., the <u>it</u> of the
English example (1a) and the <u>there</u> of (1b).

(1) a. <u>it</u> seems that the boys travelled
    b. <u>there</u> is a bird in the tree

English nonthematic subjects are always lexicalized.
The vast majority of the world's languages, however,
never display lexical nonthematic subjects. For exam-
ple, the Spanish equivalent of (1a), given below as
(2), lacks a lexical matrix subject altogether.

(2)   ∅ aparece que los muchachos viajaron

A third type of language is found, e.g., in Classical
Arabic (exemplified below in (3)) as well as many
Germanic languages (discussed later in this paper).
In these languages, nonthematic subjects are obliga-
torily null in some contexts and obligatorily lexical
in others.

(3) a. ∅ yabduu ?anna ?al-?awlaad-a saafaruu
           seems that DEF-boys-ACC travelled
        'it seems that the boys travelled'
    b. qaala ?aHmad-un ?anna-<u>hu</u> yabduu...
        said Ahmed-NOM that-it seems/3sm
        'Ahmed said that it seems...'

I follow GB tradition (specifically, the Extended
Projection Principle) in assuming that there is a

subject position in all three types of languages. The alternative position, that there is no subject in the Spanish-type languages, fails to capture at least two generalizations. Cross-linguistically, it posits a distinction between languages when there is neither need for it nor intuition behind it. Furthermore, the alternative hypothesis is forced by the data in (3) into assuming that a language may sometimes have a nonthematic subject position and other times not.

I therefore concern myself with the problem of determining what it is that is responsible for the lexicalization of nonthematic subjects in some languages and contexts, and the nonlexicalization (or nullness) of them in others.

As a first step towards this goal, I assume the dual conditions on null pronouns first made explicit by Rizzi (1986). Rizzi argues that a null pronoun must be both identified and licensed. The identification condition forms the core of all previous work on null pronouns (aka 'pro-drop' phenomena). Put simply, it states that agreement morphology (or some other identifier) must be associated with a null pronoun so that it can be interpreted (at LF).

However, agreement morphology does not correlate with the lexicalization or nullness of nonthematic subjects in any significant way. In my survey of languages (Gilligan 1987), I have found all four possible combinations of agreement (AGR) and nonthematic subject: 1) languages with AGR and lexical nonthematic subjects (e.g., the Classical Arabic example above, which displays third person singular masculine agreement); 2) languages with AGR but null nonthematic subjects (e.g., Spanish, where third person singular AGR cooccurs); 3) languages with lexical nonthematic subjects but not AGR (e.g., English); and 4) languages with null nonthematic subjects but no AGR, e.g., Papiamentu (exemplified in (4) below).

(4) a. *(mi) tin é
         I   have it
         'I have it'
    b. Ø tin un homber na porta
         have a   man   at door
         'there is a man at the door'

As agreement morphology does not determine the status of nonthematic subjects, the relevant condition on (null) pronouns must therefore be licensing.

In the extensive pro-drop literature, there are very few hypotheses as to what licensing might be.

Rizzi himself is extremely vague on the subject,
though he is insistent that it is something separate
from identification. Given the unsettled nature of
the role licensing serves in the grammar, it cannot be
surprising that there are many hypotheses (most of
which never mention licensing, per se) as to what
constitutes licensing. These range from Rizzi's
suggestion that a null pronoun is licensed by Case to
the requirement that a null pronoun need simply be
governed (found throughout the earliest work on pro-
drop) to Travis's (1984) suggestion that theta-marking
is the relevant concern. Each of these hypotheses
either fails to extend generally to the various
instances of null pronouns or does not distinguish
null pronouns from lexical pronouns.

   Those who offer no explanation of what makes some
pronouns null and others lexical instead uniformly
rely upon the Avoid Pronoun Principle (Chomsky 1981)
to do this work for them. This principle, which
transparently states that a lexical pronoun is to be
avoided whenever possible, is not a _grammatical_
constraint on pronouns; rather, it states the
conditions under which a lexical or a null pronoun
might be _used_. I propose that the Avoid Pronoun
Principle be replaced by the licensing condition,
which thereby has as its core property the distinction
between lexical and null pronouns (while avoiding the
issue of how these pronouns are used).

   The principles which make up the licensing
condition on null pronouns should therefore be those
which have some reflex at the level of lexicalization,
i.e., the phonological form (PF). The only component
which is generally thought to be relevant to PF is
Case theory. Note, for instance, the following
contrast discussed by Jaeggli (1980) among others.

   (5) a.   I wanna be an astronaut
       b. *who does my mother wanna be an astronaut?
   (6) a.   I want PRO to be an astronaut
       b. who$_i$ does my mother want e$_i$ to be an astronaut

Contraction of _want_ _to_ to _wanna_ is possible in (5a),
Jaeggli argues, precisely because the subject is a
Caseless PRO, which has no surface phonetic effects;
in (5b) the subject is a Case-marked variable and
though it is null, it has a surface reflex which
blocks the contraction.

   The strong form of the statement biconditionally
relating Case assignment and lexicalization at PF is
termed the strong Case filter (cf. Bouchard 1984), (7).

(7)   NP[+lexical] <---> Case[1]

It is assumed in the analysis which follows, despite
the fact that (7) runs counter to Rizzi's view that
null pronouns are Case-marked.
    The Classical Arabic example, repeated below, is
important to this analysis in two respects. First, it
provides another reason for preferring the strong Case
filter's prediction that null pronouns are Caseless.

(3) a.   Ø yabduu ?anna ?al-?awlaad-a saafaruu
            seems that DEF-boys-ACC travelled
         'it seems that the boys travelled'
    b.   qaala ?aHmad-un ?anna-hu yabduu...
         said Ahmed-NOM that-it seems/3sm
         'Ahmed said that it seems...'

In this language, the complementizer ?anna is
exceptional in that it assigns accusative Case to its
right, e.g., to the subordinate thematic subject in
(3a), and it is in precisely this context that a
nonthematic subject is lexicalized in (3b).
    This second point concerns the nature of Case-
assignment. Because the nonthematic subject in (3b)
(as well as the thematic subject in (3a) must be
lexicalized, it seems conclusive that Case-assignment
is obligatory. This conclusion is also correct with
respect to nonthematic subjects in all other
languages: unlike thematic pronouns, which alternate
between null and lexical forms in many languages,
nonthematic pronouns are always either lexical or null
in any particular environment.
    The conclusion that Case is obligatory runs coun-
ter to much previous work. Indeed, in earlier anal-
yses which correlate the assignment of Case and null
pronouns, it has often been argued that it is precise-
ly the optionality of Case (or government) which
allows a pronoun to avoid Case and thereby be null.

---

[1]
    The simplified version of the strong Case
filter given in (7), though adequate for the purposes
of this paper, does not explain the lexical status of
variables, e.g., the WH-trace in (5/6b). Restated as
(i), and given certain assumptions concerning Case and
variables, it does.

    (i)   NP[+lexical] <---> Case and Features

For a more detailed discussion, cf. Gilligan (1987).

But it is not necessary to conceive of Case as a rule of UG, as these analysts have done. Instead, Case may be stated as a well-formedness condition, such that when a particular context is met, e.g., a Case-assigner adjacent to a NP, Case must occur on that NP (according to the vagaries of lexical insertion) or the configuration is ruled out. Since this approach reduces the number of rules in UG and besides offers a better explanation for the distribution of nonthematic subjects, it is assumed in what follows.

What remains to be explained, then, are the principles which allow Case to be assigned to a nonthematic subject in certain contexts and not in others. I propose that the desired distinctions fall out neatly from two generally motivated mechanisms: the directionality of Case parameter Stowell (1981); and the hypothesis that there are two base-generated subject positions.

Stowell's parameter is a rare sort in GB circles: it is a parameter which has actually stood the test of time. Originally posited for theoretical reasons -- Stowell's thesis was that the base component was unordered and so he needed some other principle to account for word order -- the directionality of Case parameter has had significant success in capturing cross-linguistic generalizations, e.g., the fact that VO languages are generally prepositional and OV languages postpositional. Stowell's parameter has also proven invaluable in the analysis of languages with unusual word orders, e.g., Mandarin (Li 1985). I therefore assume without further comment the parameter in (8).

(8)   In language X, Case-assigner Y assigns Case
       (under government) to either the LEFT or RIGHT

The second cornerstone of my analysis, the hypothesis that there are two subject positions, requires more detailed argumentation. There are many incarnations of this hypothesis in the recent literature (cf. Fukui 1986), though all have at their core the notion that thematic subjects are generated in a position either adjacent to or inside VP.

(9)   IP
                          /   \
                      SPEC   I'
                              /   \
                          INFL   ?
                                  / \
                               NP   VP
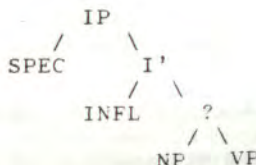
[Whether the subject is adjacent to or inside VP is tangential to my concerns, and so I leave the structure somewhat incomplete in (9) above.]

The more familiar subject position, the specifier (SPEC) of IP, is neither adjacent to nor internal to VP, of course; this is the nonthematic subject position. And since it is nonthematic, it is argued (by Koopman & Sportiche 1985, et al.) that thematic subjects in some languages may move to the IP specifier position.

Two forms of evidence support the two subject position hypothesis. First, there is the prima facie evidence supplied by Dutch, where a sentence may contain both a lexical nonthematic subject and a lexical thematic subject.

(10)   ...dat er enkele mensen mij hun   boek   geven
              that   some   people me   their books gave
          '...that some people gave their books to me'

In previous work, e.g., Thiersch (1978), it is assumed that these constructions require an inserted (or adjoined) second subject position, though clearly the base-generation of the two positions is less ad hoc, if they can otherwise be motivated.

Such motivation is provided by Sportiche (1988), who notes that the dual subject position hypothesis accounts for possible sites for floating quantifiers in French. A floating quantifier associated with a subject, he points out, is licit between an auxiliary element and the verb, but never immediately before the auxiliary or after the verb.

(11) a.   les enfants ont tous vu   ce   film
          the children have all seen this movie
          'the children have all seen this movie'
     b. *les enfants tous ont vu ce film
     c. *les enfants ont vu tous ce film

These facts fall out if it is assumed that the quantifier is base-generated in the thematic subject position (i.e., the site of NP in (9)), which itself is located between the auxiliary in INFL and the verb in VP.

Of the two subject positions, it stands to reason that only the SPEC of IP is obligatory. Too numerous to mention are the sentences which lack a thematic subject. This conclusion is also in line with the common supposition that a position for a thematic argument, e.g., a direct object, is generated only

when a theta role is assigned, e.g., by a verb. Since
nonthematic subjects appear despite their nonthematic
status, some other principle must force their
generation. One might assume, for instance, the
Extended Projection Principle, which requires that
each sentence have a subject, though it should be
noted that this principle is, according to this line
of reasoning, purely a constraint on the X-bar
expansion of INFL, such that each IP have a SPEC.

Given the discussion above, it is now possible to
explain the three types of languages noted above.
First of all, it should be clear that lexical nonthe-
matic subjects are found in those languages which
assign Case to the SPEC of IP, and null nonthematic
subjects are found in those languages which do not
assign Case to the SPEC of IP. In other words, the
difference between languages with lexical nonthematic
subjects and those with null nonthematic subjects
reduces entirely to the direction INFL assigns Case.

(12)   lexical nonthematic subjects (English):
                INFL assigns Case to the left (i.e., to the
                SPEC of IP) under govt
            null nonthematic subjects (Spanish, Papiamentu):
                INFL assigns Case to the right (i.e., to
                the CPLT of IP) under govt

The third type mentioned above, Classical Arabic, is
the same as Spanish, except ?anna assigns Case to the
right (i.e., to the SPEC of IP) and so makes subordi-
nate nonthematic subjects in this language lexical.

If this solution is truly adequate, it should
extend to other languages of the types mentioned
above, and for the most part this is the case. Yet it
is not so clear how this analysis explains the
distribution of lexical nonthematic subjects in mixed
languages like Classical Arabic, especially since
lexical nonthematic subjects in Arabic occur due to
the idiosyncratic nature of the complementizer ?anna.
It is therefore instructive to examine in more detail
two familiar languages which fall into the mixed type,
Icelandic and standard German.

In Icelandic, a nonthematic subject is lexical
only when it is string-initial, e.g., (13a). In
subordinate and inversion contexts, on the other hand,
such a subject is obligatorily null.

(13) a. *(það) var dansað a skipinu
            it   was danced on ship
          'it was danced on the ship'

(13) b. Þu heldur (að) (*Það) var dansað a   skipinu
         you believe that it   was danced on ship
         'you believe that it was danced on the ship'
     c. a skipinu var (*Það) dansað
         on ship   was   it   danced
         'it was danced on the ship'
     d. hvar var (*Það) dansað
         where was it   danced
         'where was it danced?'

Since Case is not assigned uniformly to all
nonthematic subjects in Icelandic, it is unlikely that
INFL assigns Case to the SPEC of IP. In this way,
then, Icelandic mirrors Spanish, Papiamentu and
Classical Arabic. The remaining puzzle, of course, is
to explain the exceptional lexicalization of the
nonthematic element in (13a).

     The string-initial position in Icelandic (and the
other verb-second languages) is generally agreed to be
a grammaticalized topic position, so that by extension
the lexical nonthematic pronoun in (13a) is a topic.
Topic positions may be filled via movement, when a
phrasal unit of the sentence is fronted, (14a), or a
phrase may be base-generated in the topic position,
(14b).

(14) a. John, I like
     b. John, I like him

Moved topics are assigned Case inside the sentence and
retain that Case after movement. Base-generated
topics lack a direct intrasentential source, however,
and must therefore be Case-marked (hence lexicalized)
in some other manner.

     The purpose of this paper is not to suggest the
source of Case for base-generated topics. One might
suppose, though, that coindexing is involved in (14b),
just as in (14a). After all, it is commonly remarked
that base-generated topics must be in some sense
related to a sentential phrase. Though this sugges-
tion apparently fails with respect to nonthematic
pronouns, which by their very nature cannot be seman-
tically related to anything, a weaker version of the
relation -- say, in terms of a syntactic linking or
coindexing -- is generally adequate. Assuming that
this coindexing involves the sharing of Case, the
lexical status of grammatical topics is solved.

     German presents a somewhat more involved case.
In the standard dialect, as in Icelandic, topicalized
nonthematic subjects are lexical whereas most

nontopicalized nonthematic pronouns are obligatorily
null. Thus, it seems evident that INFL assigns Case
to the right (i.e., to the CPLT of IP) in both these
mixed type languages. The German data is somewhat
more complicated, however, by the fact that the
nonthematic subjects of impersonal transitives, (15),
and adjectival extrapositions, (16), are optionally
lexical in nontopicalized contexts.

(15) a.　es ekelt　　mir　　vor　　dir
　　　　　it disgust me/DAT before you
　　　　　'you make me sick'
　　b.　mir ekelt ('s) vor dir
(16) a.　es wäre　am besten, heimzugehen
　　　　　it would be best　　to go home
　　　　　'it would be best to go home'
　　b.　jetzt wäre　(es) am besten, heimzugehen
　　　　　now　would　it　be best　　to go home
　　　　　'now it would be best to go home'

The optional lexicalization of these nonthematic
subjects is extremely unusual, there being no other
such instances in the more than one hundred languages
I have surveyed. This indicates that there are two
possible structures for these sentences, i.e., that
this represents a change in progress. By the analysis
presented thus far, the structure where es is null
occurs when es is interpreted by the speaker as a
nonthematic subject, and it's nullness results from
the direction INFL assigns Case, i.e., away from the
nonthematic subject position.
　　In the structures with a lexical es, I propose
that es is lexical because native speakers consider it
a thematic subject pronoun and standard German does
not allow null thematic pronouns. Two forms of
evidence can be educed in support of this proposal.
　　First, it can be shown that constructions similar
to (15) behave oddly with respect to the lexical
status of their subjects. In Hebrew, for instance,
Borer (1984:216) points out that predicates of the
sort in (15) appear to have lexical nonthematic
subjects.

(17)　　ze margiz 'oti še-Itamar　tamid me'axer
　　　　it annoy　me　that-Itamar always late
　　　　'it annoys me that Itamar is always late'

Outside these constructions, however, Hebrew has only
null nonthematic subjects. One may attempt to explain
the exceptional nature of these nonthematic subjects,

or deny that they are nonthematic. The following
example from Berman (1980:767,fn.10) apparently
decides the issue.

(18)   ze še   hu kolkax satum margiz oti
          it that he so   dumb annoy me
          'it annoys me that he is so dumb'

In (18), the preverbal position, which is generally
filled by only a single phrasal unit, contains both ze
and a sentential complement. It must be concluded
that ze and the sentential complement form a consti-
tuent, and since the sentential complement is clearly
thematic, so then must be the complex constituent
containing ze. Hence, ze is a thematic element, much
like the it found in the typical factive complement of
the English example, (19).

(19)a.   I regret it that we had left so early
    b.   I regret the fact that we had left so early

     Note that this line of argumentation predicts
that it should be possible to replace the inverted
lexical es of (16)-(17) with an obviously thematic
element, similar to the fact in (19b). Indeed, as I
was informed at the conference, this prediction is
apparently correct, at least for the es in (16), which
may be replaced with the demonstrative dass.

     In closing, I would like to place this analysis
in a wider perspective. The data explained in this
paper is by no means a collection of new and
surprising facts: these points are very generally
recognized. What I have done is provide a simple and
extremely general analysis of nonthematic subjects
within the GB framework, one which does not require
any mechanisms which are specific to this construction
or to a single language.
     In part, this analysis is proferred in response
to those GB analysts who do not constrain themselves
by the facts of cross-linguistic variation, and
instead suppose that ever more abstract analyses of
data from a single type of language will eventually
suffice. But this paper is more immediately addressed
to those linguists who have claimed that a discourse-
based analysis of null pronouns is adequate, e.g., Li
& Thompson (1979) and Okamoto (1985). These analyses
ignore the possibility that sentence-based grammar is
involved, and explain null pronouns by making
reference to the notion, discourse topic.

At some level [the level of use, to my way of thinking], the discourse-based generalization is undoubtedly correct, at least for thematic subjects. However, nonthematic subjects do not have thematic content, so it is nonsensical to think of them in terms of discourse topics (even though I have analyzed them as sentence topics in Icelandic and German). Thus, it must be concluded that a discourse-based approach which ignores a sentence-based theory of licensing, like the one presented in this paper, is inadequate to the task.

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Delayed Pitch Fall Phenomenon in Japanese

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1. Introduction

One of the goals of historical linguistics is to identify and describe sound changes systematically. A further goal is to provide an account of the causes of sound change. McCawley (1977) claims that the contemporary accentual system of the Tokyo dialect of Japanese is likely to have developed from a proto-system by a shift of the original accent one syllable to the right.[1] The present study attempts to identify a trigger of this historical accent change in acoustic terms, following Ohala's (1981, 1983, in press) hypothesis of sound change. He claims that many sound changes result from errors of transmission of pronunciation from one speaker to another and that the "seeds" of such sound changes should occur in present-day speech, and thus be available for investigation.

In view of this hypothesis, it is intriguing to find that phonetically the accentual high tone in present-day pronunciation of Japanese frequently occurs on the post-accent syllable, apparently without listeners detecting any change in accent placement. We claim that this phenomenon, which is called *delayed pitch fall*, is a strong candidate for a seed of the rightward accent shift.[2] In this paper, we sketch accentual changes in Japanese, then discuss acoustic and auditory characteristics of pitch accent, and finally report the results of our acoustic analysis of the pronunciation of the present-day Tokyo dialect.

2. Historical Accent Change

One of the major sources of information regarding the accentual system of Japanese is *The Ruijumyogisho*, a dictionary compiled in Kyoto about 1100 A.D. and substantially revised in the early 1200's. This document reflects the dialect of Late Old Japanese (LOJ), spoken by members of the Japanese aristocracy living in and around Kyoto. LOJ, as recorded in *The Ruijumyogisho*, had five accentual patterns for two syllable nouns. Another major document is *The Bumoki* of 1687, which records the Kyoto dialect of Middle Japanese (MJ). There are three accentual patterns for two syllable nouns (Hattori 1951; Kindaichi 1942, 1951, 1974; Komatsu 1977).[3]

Class	Late Old Japanese	Middle Japanese	Example
1	H H	H H	hana 'nose'
2	H L	H L	uta 'song'
3	L L		tuki 'moon'
4	L H	L H	sora 'sky'
5	L F		haru 'spring'

Table 1: Accentual patterns of two syllable nouns[4]

The most notable fact is that these accent changes are regular, i.e., words that belong to a certain class in LOJ shift accent in the same manner in MJ. Using these and other documents, many attempts have been made to reconstruct the accentual system of pre-historic Japanese (e.g. Hattori 1951; Hayata 1973; Okuda 1975).

The regularity in accent change generally holds in synchronic variations as well. Words which belong to class A in a given dialect together belong to class B in another dialect. McCawley attempted a reconstruction based solely on synchronic variations, assuming that the differences among the present-day dialects reflect the distinctions in the proto-language.

In the Tokyo dialect, the location of fundamental frequency (F0) fall from relatively high to relatively low is the only acoustic correlate of accent.[5] The accent pattern of words, therefore, can be represented simply by marking the location of F0 fall, if there is one (McCawley 1968; Haraguchi 1977; Poser 1984; Beckman and Pierrehumbert 1986, Pierrehumbert and Beckman 1988). McCawley (1977) used an apostrophe to indicate this F0 fall. In order to represent the Kyoto dialect, which has more patterns than the Tokyo dialect, he used an apostrophe word-initially to distinguish initial low tone from initial high tone. If there is no apostrophe in initial position, the word begins with a high tone.

Class	Example	Tokyo	Kyoto	Akita	Kagoshima	Reconstr.
1	usi 'cow'	00	00	00	Falling	00
2	hasi 'bridge'	00'	0'0	00		0'0
3	hana 'flower'			00'		'0'0
4	hasi 'chopstick'	0'0	'00	0'0	Level	'00
5	mado 'window'		'00'			'00'

Table 2: Synchronic dialectal variations (McCawley 1977)

McCawley first compared two-syllable words in the Tokyo and Kyoto dialects. The Tokyo dialect has three patterns, whereas the Kyoto dialect has four. Since there are no segmental characteristics to account for this difference, he attributed it to the accentual system of the parent language. In the Akita dialect, the 'bridge-flower' class nouns divided into two sets of reflexes. Therefore, he added another pattern to the parent accentual system. As for the phonetic value of the 'flower' class nouns (class 3), he inferred an LL pattern from the Kagoshima dialect, in which *Falling* corresponds to initial high patterns, and *Level* corresponds to initial low patterns in the Kyoto dialect. He then checked his reconstruction against *The Ruijumyogisho* and confirmed that these two correspond quite well.

Class	Example	*Ruijumyogisho*	Reconstruction	Tokyo
1	usi 'cow'	HH	00	00
2	hasi 'bridge'	HL	0'0	00'
3	hana 'flower'	LL	'0'0	
4	hasi 'chopstick'	LH	'00	0'0
5	mado 'window'	LF	'00'	

Table 3: *Ruijumyogisho* and McCawley's reconstruction

Class 1 has no accent, and no accent change has occurred. Classes 2 and 3, as well as classes 4 and 5, have merged in the Tokyo dialect. Notice, for example, that in class 2 nouns, the place of F0 fall is after the first syllable in the reconstruction, whereas it is after the second syllable in the Tokyo dialect. From this table, he concluded that the Tokyo dialect had developed from the proto-language by shifting the original accent one syllable to the right.[6]

3. Acoustic and Auditory Characteristics of Pitch Accent

The claim that Japanese is a pitch-accent language is based almost exclusively on native speakers' introspection or impressionistic data. Onishi (1942) argued that since the function of accent is to differentiate the meaning of, or to make prominent a portion of, words or phrases, any features that can serve these purposes (e.g. loudness and duration) may be distinct. In the case of Japanese, he suggested that accent was an impressionistic sum of pitch and loudness.

Neustupný (1966) found positive evidence for this claim. He pointed out that accent, as conventionally known, and the real F0 fall often do not synchronize: F0 fall is delayed in relation to an accented syllable. He

called this phenomenon *oso-sagari* (delayed pitch fall). He therefore claimed that the F0 data by itself are not sufficient for determining the accent pattern, and that since, in his data, the amplitude peak falls on the accented syllable in the words in which F0 fall delays, both F0 and amplitude are distinctive features in the Japanese accentual system.

On the basis of acoustic and perceptual experiments using synthetic speech, Sugito (1972, 1982) refuted Neustupný's hypothesis. She found that native speakers perceive an accent on a vowel when the vowel is followed by a falling F0 contour, even though the F0 peak of the accented vowel is not higher than that of the following vowel. Her discovery is schematically represented in Figure 1. When the vowel /a/ in /ima/ 'now' has a falling F0 contour, native speakers perceive an accent on /i/ as if they heard the F0 contour indicated by the dashed line.
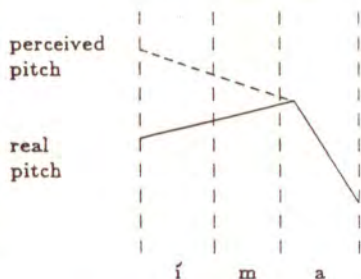
Figure 1: F0 contour and perceived pitch accent

4. Acoustic Study

The purpose of our acoustic study is to investigate whether this delayed pitch fall phenomenon in contemporary Tokyo Japanese may be a possible seed for the historical accent change. Applying instrumental analysis, we aimed to characterize delayed pitch fall in production and perception. We hypothesized that the delay of F0 fall can be compensated by a steeper fall. When the speaker utters a word with a delayed pitch fall, the listener normally is able to factor out this delay with the compensatory cue for the delay. When, on the other hand, some listeners fail to implement this perceptual compensation and rather take the location of the F0 fall at face value, the sound change could occur. We also investigated whether or not there is some limit beyond which the accent cannot be perceived on the preceding syllable even when the F0 fall is very steep.

4.1. Production Experiment

4.1.1 Method

Twenty-four words containing a /VmV/ sequence were prepared and embedded in semantically natural sentences. Those words have an accent on either the first or the second vowel of the /VmV/. There were two reasons for choosing a nasal as the intervening consonant. First, we wanted continuous F0 to examine where F0 starts falling. Second, there are indications that when a vowel which is expected to have an F0 peak is followed by a nasal, the F0 peak often appears in the nasal (Ladd and Silverman 1984). Because of the latter factor, we thought we might be more certain of getting tokens of delayed pitch fall with a nasal consonant. For example, the word /hanámiti/ 'a passage way to the stage' has an accent on the first vowel of the /VmV/ sequence, /a/, whereas /hanami ni/ 'for flower viewing' has an accent on the second vowel, /i/.

Seven native speakers of the Tokyo dialect were asked to pronounce the words in sentences five times each for a total of 840 sentences. Segmentation was manually performed with the aid of both spectrograms and waveforms. The F0 and amplitude contours of the /VmV/ portions were then extracted.

Acoustical analysis was conducted by examining the location and the steepness of F0 fall. The tokens with the accent on the first vowel were categorized according to the actual location of an F0 fall. In this study, we were focusing on two situations: the F0 starts falling within the first (accented) vowel and within the second (post-accent) vowel. For convenience, we call the first type *non-delayed tokens*, and the second type *delayed tokens*.

4.1.2. Results

The results indicate that 24% of all tokens have an F0 fall delayed to the second vowel of /VmV/. The following figures show F0 contours of a non-delayed token and a delayed token for the same word /námida/ 'tear (noun)' spoken by two different female speakers. In Figure 2.1. the F0 starts falling within the accented /a/, whereas in Figure 2.2. the F0 fall occurs on the post-accent /i/.

As Sugito pointed out, the amplitude is not a cue for determining the location of accent. Figures 3.1 and 3.2 indicate the amplitude contour for the same tokens as the previous figures. Notice that in Figure 3.2. the amplitude for the accented /a/ is lower than for the post-accent /i/. We contend that neither F0 peak nor amplitude peak signals accent location in this token.
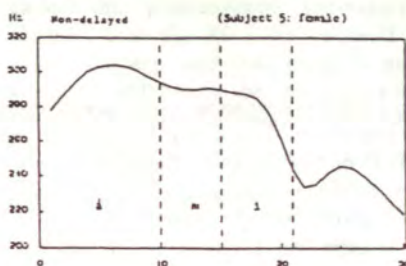
Figure 2.1: F0 contour for the
word /námida/
(non-delayed token)
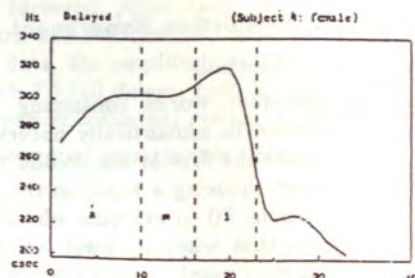
Figure 2.2: F0 contour for the
word /námida/
(delayed token)
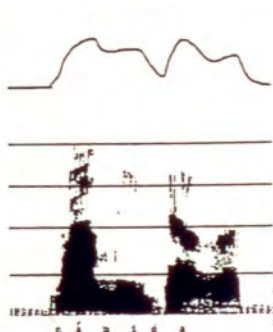
Figure 3.1: Amplitude contour for
the word /námida/
(non-delayed token)
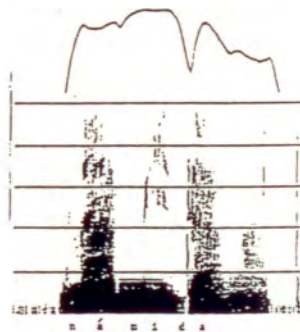
Figure 3.2: Amplitude contour for
the word /námida/
(delayed token)

The following table shows the median of the rate of F0 fall computed
in Hz/csec for each subject (csec = 10 msec). For example, Subject 4 has
10.0 Hz/csec for delayed tokens as opposed to 6.5 Hz/csec for non-delayed
tokens. The overall tendency is for delayed tokens to show a steeper F0
fall in comparison with non-delayed tokens.

Subject	Non-delayed tokens	Delayed tokens
1(Male)	3.5	5.3
2(Male)	3.5	4.8
3(Female)	4.6	6.2
4(Female)	6.5	10.0
5(Female)	5.7	7.5
6(Female)	7.2	10.2
7(Male)	2.1	3.6

Table 4: Median of F0 fall (Hz/csec) by subject

The above finding is clearly demonstrated by the following figure, where the solid line indicates /ámi/ with delayed pitch fall and the broken line indicates /amǐ/ without delayed pitch fall. Note that the F0 peaks occur in virtually the same place and that the rising F0 contours have virtually the same shape. But fall rates are different in these two words. The word /amǐ/ shows a much gentler slope in comparison with /ámi/.
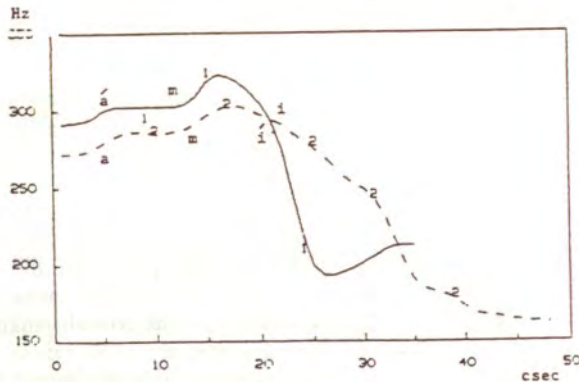
Figure 4: F0 contours of a delayed token /ámi/
and a non-delayed token /amǐ/

4.2. Perceptual Experiment

4.2.1. Method

The second experiment examines the delayed pitch fall phenomenon from a perceptual point of view: viz. whether or not the longer delay of F0 fall

is compensated by the steeper fall in perception as well. And when this is so, we attempt to determine the minimum F0 fall rate required for an accent to be perceived on the preceding syllable as the F0 peak location delays into a target vowel.

We synthesized nonsense 3-syllable stimuli /mamama/, using a male speaker's pitch range. The duration of the vowel /a/ was either 100 or 130 msec, whereas the duration of /m/ was fixed to 70 msec. The F0 contour of the stimuli is a rise-fall shape with the starting F0 at 125 Hz, linearly ascending to 160 Hz, and ending at 80 Hz. These stimuli were prepared with two variables: F0 peak locations, and F0 fall rates. The peak occurred at several different locations: at approximately 20, 30, 50, 60 or 70% of the second vowel of /mamama/.
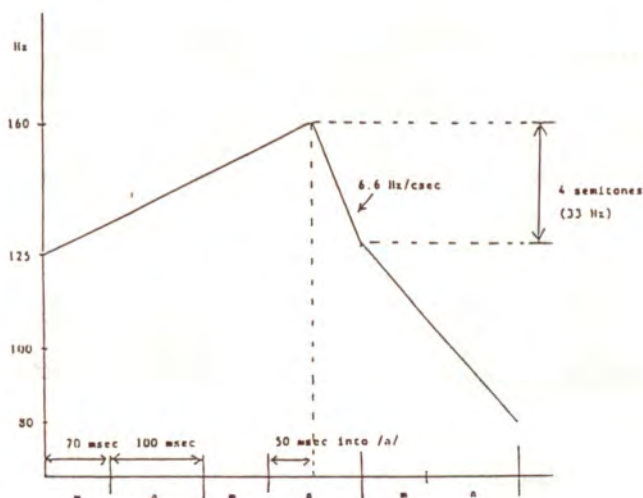
Figure 5: Sample F0 contour of the stimuli /mamama/

The other variable was fall rates (from 2.1 Hz/csec to 33 Hz/csec). which was computed as follows:

$$\text{Fall rate} = \frac{33}{t}\text{Hz}/\text{csec}\,(\text{where } t = 1.2.3 \cdots 16 \text{ csec})$$

The 100-msec and 130-msec tokens were separately randomized and presented to 15 native speakers of Japanese, who were asked to determine

whether the accent pattern was like /námida/ 'tear' (accent on the first vowel), or like /okási/ 'sweets' (accent on the second vowel) for each /mamama/ token.

4.2.2. Results

The following figures indicate the subjects' judgment for the first vowel to be perceived as accented. The horizontal axis shows the pitch fall rate in Hz/csec, while different curves show the different locations of the beginning of F0 fall within the second vowel. In this perceptual experiment, as in the production experiment, we found that the later the F0 fall occurs in the second vowel of the stimuli, the steeper the F0 fall required in order for the listener to identify accent on the first syllable. For the 100-msec vowel stimuli, more than half of the subjects perceived the first syllable as accented, even when the F0 fall was as mild as 3-4 Hz/csec at the 20% or 30% peak location (i.e. the peak at 20 msec or 30 msec from the onset of the second vowel). However, when the F0 peak occurred at the 50% location, approximately 8 Hz/csec were necessary for the majority of the subjects to perceive an accent on the first syllable. At the 60% location, a much steeper fall of 16 Hz/csec was needed. Furthermore, at the 70% location, a fall as steep as 33 Hz/csec failed to compensate for the delay. In this case, the majority of subjects perceived the second syllable as accented.

The tendency for the longer delay of F0 fall to require the steeper fall was also observed for the 130-msec vowel stimuli. There is a difference in subjects' judgment across vowel durations, however. For the 100-msec vowel stimuli, the fall rate of 33 Hz/csec yielded 93% identification of the accent on the first syllable at the 60% location. In this case, the ceiling effect occurs somewhere between the 60% and 70% locations. For the 130-msec vowel stimuli, beyond the 60% location, an accent was never perceived on the preceding syllable, even when the fall was as steep as 33 Hz/csec. In other words, a ceiling effect existed somewhere between the 50% and 60% locations. We speculate that as the vowel becomes shorter, a somewhat longer delay (in terms of ratio to the vowel duration) is permitted to be compensated by a steeper fall.

We conclude that there exists a positive correlation between steepness of F0 fall and the degree of delay in delayed tokens. Moreover, the F0 fall delay was found to have some limit beyond which the accent was never perceived on the preceding syllable even when the fall was very steep.
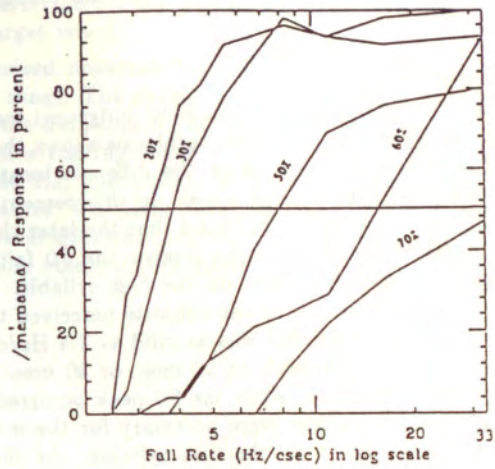
Figure 6.1: Responses of /mámama/ in percent (Vowel = 100 msec)
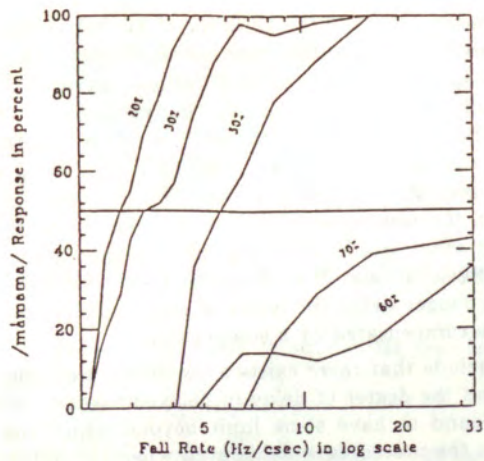
Figure 6.2: Responses of /mámama/ in percent (Vowel = 130 msec)

5. Conclusions

Hypothesizing that the contemporary accentual system of the Tokyo dialect has developed from a proto-system by a shift of the original accent one syllable to the right, we looked at acoustic data to determine a possible seed of this accent change. We confirmed Sugito's claim that the F0 peak of the accented vowel is not necessarily higher than the F0 peak of the following vowel because native speakers perceive an accent on a vowel when the vowel is followed by a falling F0 contour. We also found that there is a positive correlation between degrees of delay and steepness of F0 fall in delayed pitch fall tokens. Furthermore, our data show that this delay cannot be limitless.

How do these results, then, lead to the historical accent change we mentioned at the beginning? The scenario would work in the following way: the speaker pronounced a word with delayed pitch fall. If the delay was compensated by a steep fall, the accent would be perceived on the conventionally accented syllable, even though the potential incipience of the accent shift existed. If, on the other hand, the listener interpreted the delay as a rightward shift of accent, a sound change would occur and might spread into the larger community.

Notes

[1] Hyman (1978) also observes that when tones and syllables desynchronize, it is almost always the case that the tones last too long. In other words, tones almost always spread rightwards rather than the reverse.

[2] Strictly speaking, it is not pitch but fundamental frequency which delays (cf. note 5).

[3] Although small in number, there are some two-syllable words with the rise-low accentual pattern recorded in *The Ruijumyogisho* (Hattori 1951).

[4] Even though *The Ruijumyogisho* and *The Bumoki* record five and three patterns, respectively, for two-syllable nouns, more patterns exsisted, which were manifest only when a noun was followed by an enclitic particle. For example, Hattori (1951) assumes that there were at least six patterns for two-syllable nouns in LOJ; viz. HH(H), HH(L), HF, HL, LH(H),

LH(L).

[5] The term *tone* refers to a particular way in which pitch is utilized in language; the term *pitch* refers to how a hearer places a sound on a scale ranging from low to high without considering the physical properties of the sound; the term *fundamental frequency* refers to the frequency of repetition of a sound wave of which, when analyzed into its component frequencies, the fundamental is the highest common factor of the component frequencies (Ladefoged 1962).

[6] McCawley notes that there are no neat correspondences for three syllable nouns, except those found between the Kagoshima dialect and *the Ruijumyoogisho*.

[7] Fujisaki and Sugito (1977) found that amplitude has little influence on perception of pitch.

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Animacy versus Ergativity:
Which Affects Persian Verb Agreement?
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University of California, San Diego

1.   **Introduction.**   Previous accounts claim that verb
agreement in Modern Persian is sensitive to animacy
since there are cases where verbs obligatorily agree
with animate subjects (1-2), and do not agree with
inanimate ones (3-5) (Rastorgueva 1964, de Fouchecour
1976, Barjasteh 1983).[1]

(1)   laleh-o moin qäza-ro dorost=kärd-änd
      Laleh-and Moin food-AC   fix=did-3P
      'Laleh and Moin fixed the food.'
(2)   äsb-ha tämam-e äläfa-ro xord-änd
      horse-PL all-of hay-AC ate-3P
      'The horses ate all the hay.'
(3)   šiše-ha   šekäst
      glass-PL broke:3S
      'The windows broke.'
(4)   lebas-ha-t   birun avizun=bud
      dress-PL-your outside hanging=was:3S
      'Your clothes were hanging outside.'
(5) noxod-ha äz kise rixt   birun
     bean-PL from bag poured:3S out
     'The beans poured out of the bag.'

However, sentences like (6-10) generally are not con-
sidered.   In the first set of sentences, the verb does
agree with an inanimate subject (6-8).   Moreover,
agreement is obligatory. Agreement does not obtain in
the second set (9-10) even though the single noun of
the clause may be animate.

(6)   gol-ha   sal-e   no qonce=mi-kon-änd
      flower-PL year-EZ new bloom=CNT-do-3P
      'The flowers bloom at New Year.'
(7)   setare-ha där šäb cešmäk=mi-zän-änd
       star-PL in night wink=CNT-hit-3P
      'The stars sparkle at night.'
(8)   mašin-ha ru yäx sor=xord-änd
      car-PL on ice slide=ate-3P
      'The cars slid on the ice.'
(9)   se-ta ketab tu otaq häst
      3-CL book in room EXIST
      'There are three books in the room.'
(10) se-ta pesär tu otaq häst
      3-CL boy in room EXIST
      'There are three boys in the room.'

The analysis proposed herein argues that subject verb agreement is obligatory regardless of whether the nominal is animate or inanimate. Towards this end, it will be shown that the lack of agreement in (3-5) and (9-10) results from the fact that the single NPs of these sentences are [NP,VP] and not [NP,IP] at S-structure. First, we will examine the cases of no agreement with inanimate nouns in (3-5). Then we will discuss the cases in (9-10) where there is no agreement with animate nouns. We will show that (3-5) and (9-10) differ crucially in the abstract Case borne by the overt nominals. From our analysis, we will conclude that sentences (6-8) where the verb agrees with an inanimate subject are not exceptional.

2. **Null Agreement with Inanimate Nominals**. The intransitive verbs in (3-5) have alternate transitive forms, given in (11-13) where the complement of VP in the transitive sentence corresponds to the presumed [NP,IP] of the intransitive clause.

(11) bäcce-ha šiše-ha-ro   šekäst-änd
      child-PL glass-PL-AC broke-3P
      'The children broke the windows.'
(12) laleh lebas-ha-t-o   birun avizun=kärd
      Laleh dress-PL-your-AC outside hanging=did:3S
      'Laleh hung your clothes outside.'
(13) laleh noxod-ha-ro äz kise   rixt   birun
      laleh bean-PL-AC from bag poured:3S out
      'Laleh poured the beans out of the bag.'

These facts suggest an analysis originating from Perlmutter's (1978) unaccusative hypothesis, and further extended within the Government and Binding framework by Burzio's (1981) account of ergative verbs in Italian.

An analysis of these facts must account for another class of intransitive predicates which also do not agree with inanimate subjects. However, unlike the ergative verbs in (3-5), those in (14-16) do not have transitive counterparts.

(14) portäqal-ha oftad ru zämin
      orange-PL fell:3S on ground
      'The oranges fell on the floor.'
(15) zärdalu-ha resid
      apricot-PL arrived:3S
      'The apricots ripened.'
(16) tämam-e šäb   šir-ha cekke=mi-kärd
      all-EZ night faucet-PL drip=CNT-did:3S
      'The faucets were dripping all night.'

Sentences (14-16) are similar to (3-5) in that the so-
called 'subjects' are not agents. Rather the nominals
in (14-16) are semantically patients. That is, they
are arguments which are affected in or by the action of
the predicate. Since the nominals in both sets of sen-
tences appear to be D-structure internal arguments of
VP, and since there is no thematic or referential sub-
ject in the clauses, we assume that the predicates in
(3-5) and (14-16) are in fact ergative verbs. In sec-
tions 2.1 and 2.2, we present evidence from the place-
ment of the progressive auxiliary **däštän** 'to have' and
from the alternation of the null subject and lexical
pronouns that the nominals in (3-5) and (14-16) are not
in the [NP,IP] position.
2.1. **The Progressive Tense**. The progressive auxiliary
däštän may appear adjacent to the main verb (17a), or
it may precede the internal arguments of VP, as in
(17b).² (17c) indicates that the auxiliary may not
precede the subject.

(17) a.   moin ketab-o dar-e   mi-xun-e
          Moin book-AC PROG-3S CNT-read-3S
          'Moin is reading the book.'
     b.   moin dar-e ketab-o mi-xun-e
          Moin PROG-3S book-AC CNT-read-3S
          'Moin is reading the book.'
     c. * dar-e   moin ketab-o mi-xun-e
          PROG-3S Moin book-AC CNT-read-3S
          'Moin is reading the book.'

However, when the verbs in (3-5) and (14-16) are in-
flected for the progressive tense, the auxiliary may
precede the single nominal, as shown in the sentence
pairs in (18-19).

(18) a.   noxod-ha dar-e   äz kise mi-riz-e   birun
          bean-PL PROG-3S from bag CNT-pour-3S out
          'The beans are pouring out of the bag.'
     b.   dar-e   noxod-ha äz kise mi-riz-e   birun
          PROG-3S bean-PL from bag CNT-pour-3S out
          'The beans are pouring out of the bag.'
(19) a.   šir-ha   dar-e cekke=mi-kon-e
          faucet-PL PROG-3S drip=CNT-do-3S
          'The faucets are dripping.'
     b.   dar-e   šir-ha cekke=mi-kon-e
          PROG-3S faucet-PL drip=CNT-do-3S
          'The faucets are dripping.'

That the progressive auxiliary **däštän** may precede the
single nominal in (18b) and (19b) indicates that the
nominals in (3-5) and (14-16) are not subjects.

2.2. **Null Subjects and Lexical Pronouns**. The alterna-
tion of null and lexical pronouns offers a second test
of subjecthood for the nominals in (3-5) and (14-16).
If the nominals in (3-5) and (14-16) are subjects, the
parallel clauses with plural empty subjects should be
possible, since Colloquial Modern Persian is a null
subject language. Empty subjects also alternate with
lexical pronouns when used independently, i.e., when
the pronominal refers to some salient entity previously
mentioned in the discourse. Generally, the lexical pro-
noun is used in emphatic contexts, whereas the empty
subject is used nonemphatically (20).

(20) (un) räft birun
      (he) went:3S out
      He/she went out.

However, as indicated in (21-24), a null subject
is not possible in a nonemphatic clause with an
ergative verb that does not bear verb agreement.

(21) *(unha) birun   avizun=bud
      *(they) outside hanging=AUX:3S
      'They were hanging outside.'
(22) *(unha) äz kise   rixt   birun
      *(they) from bag poured:3S out
      'They poured out of the bag.'
(23) *(unha) oftad ru zämin
      *(they) fell:3S on ground
      'They fell on the floor.'
(24) *(unha) tämam-e šäb cekke=mi-kärd
      *(they) all-EZ night drip=CNT-did:3S
      'They were dripping all night.'

In (21-24), the null subject cannot refer to a plural
nominal. Instead, the only readings possible are with
a singular [NP,IP], e.g. 'It was hanging outside' (21),
'It fell on the floor' (23), and 'It was dripping all
night' (24). (22) is not possible without the overt
pronoun, since the verb rixtän 'to pour' only selects a
plural argument. As such, in (21-24) reference to a
plural nominal is possible only when an overt plural
pronominal, such as unha 'they', appears. However, the
emphatic **versus** nonemphatic contrast of the null
subject/lexical pronoun alternation is not possible
since use of unha does not denote emphasis. The lack
of a empty element in (21-24) and the loss of the
emphatic/nonemphatic contrast indicate that the nomi-
nals in (3-5) and (14-16) are not in the [NP,IP]
position. Therefore, agreement between the inanimate

nominal and the verb does not obtain since the former
is not a subject at S-structure.
2.3. **Exceptional Case Marking**. Despite the syntactic
arguments against subjecthood, the morphology of the
single inanimate nominals indicates that they bear the
Nominative Case. In Persian the structural Cases are
apparent from the combination of specificity and defi-
niteness markers. For example, the marker -ra or -ro
is borne by direct objects which are specific (cf.
(25-26)). The plural morpheme -ha is borne by defi-
nite nouns as in (27).

(25)   moin ketab-o mi-xund
       Moin book-AC CNT-read:3S
       'Moin was reading the book.'
(26)   moin ketab mi-xund
       Moin book CNT-read
       'Moin was reading books.'
(27)   bäcce-ha ketab-ha-ro mi-xund-änd
       child-PL book-PL-AC CNT-read-3P
       'The children were reading the books.'

Therefore, if a plural noun bears both -ha and -ra, it
must have abstract Accusative Case. If a nominal bears
only -ha, it must have abstract Nominative Case.
    Therefore, since the single nominals in (3-5) and
(14-16) are marked with -ha only, they must bear the
Nominative Case, even though they are not in the
[NP,IP] position. According to Burzio's (1981) analy-
sis of Italian subject inversion, the exceptional
Nominative Case marking results from the fact that the
overt nominal, which is in the [NP,VP] position at both
D-structure and S-structure, is the terminal member of
a CHAIN which is headed by a null element, as indicated
in the structural representation of (14) given in (28).

(28)   [ₑ __ᵢ [ᵥₚ portäqal-haᵢ oftad ru zämin]]
           |_____|

The null subject binds or is coindexed with the single
overt nominal. This configuration is parallel to that
proposed for expletive constructions in English
(Chomsky 1986). Furthermore, we assume according to
Burzio's account of ergativity that one of the proper-
ties of this class of predicates is that they are un-
able to assign structural Case to their complements.
However, the internal arguments of such verbs are coin-
dexed with the [NP,IP] which is a Case position.
Therefore, the exceptional Nominative Case marking re-
sults from the null subject transmitting Case to the
overt NP. In this fashion the binding mechanism cap-

tures the intuitive idea that the nominals in (3-5) and (14-16) are related to the subject and bear Nominative Case without actually being the subject.

2.4. **Animacy versus Inanimacy Revisited**. Up until this point, we have examined verbs which select inanimate complements. Let us now consider the verbs <u>oftadän</u> 'to fall', <u>avizun=budän</u> 'to be hanging', and <u>rixtän</u> 'to pour' which may select animate internal arguments. Note in (29-31) that the verbs obligatorily bear agreement markers with animate nominals.

(29) bäcce-ha oftad-änd ru zämin
      child-PL   fell-3P on ground
      'The children fell on the ground.'
(30) meimun-ha äz deräxt avizun=bud-änd
      monkey-PL from tree hanging=were-3P
      'The monkeys were hanging in the tree.'
(31) märdom äz sinema rixt-änd birun
      people from cinema poured-3P out
      'The people poured out of the movie theater.'

However as shown in (32-33), the placement of the progressive auxiliary indicates that animate single nominals are also not in the [NP,IP] position.

(32) dar-änd bäcce-ha mi-oft-änd ru zämin
      PROG-3P child-PL CNT-fall-3P on ground
      'The children are falling on the ground.'
(33) dar-änd märdom äz sinema mi-riz-änd birun
      PROG-3P people from cinema CNT-pour-3P out
      'The people are pouring out of the movie
      theater.'

Therefore, like the inanimate clause counterparts, the structural representations of (29-31) are (34-36), where the null subject and the single NP are coindexed.

(34) [$_{IP}$ ___$_i$ [$_{VP}$ bäcce-ha$_i$ oftad-änd ru zämin]
(35) [$_{IP}$ ___$_i$ [$_{VP}$ meimun-ha$_i$ äz deräxt avizun=bud-änd]
(36) [$_{IP}$ ___$_i$ [$_{VP}$ märdom$_i$ äz sinema rixt-änd birun]

Nevertheless, the binding relation which holds between the null subject and the single nominal must be different given the obligatory verb morphology in (29-31). Following Burzio 1981 and Chomsky 1986, I propose that in sentences (34-36) the person and number features of the overt nominals are transferred to the empty subject, with which the verb agrees in turn. In this fashion the subject-verb agreement in (34-36) is the same as the agreement in sentences (1-2) and (6-8). The only difference is that in (34-36) the subject is

empty and receives its features through a binding rela-
tion with another nominal. This feature agreement is
similar to that which holds between an antecedent and
an anaphor.

Comparing sentences (3-5) and (14-16) with sen-
tences (34-36), we conclude that the CHAIN which holds
between the null subject and the overt NP is sensitive
to the animacy of the latter. If the overt nominal is
animate, there is feature agreement between the empty
subject, and the animate nominal it binds. However, if
the nominal is inanimate, there is no feature agree-
ment, and thus there is no verb agreement.

3. **Verb Agreement in the Existential Construction**. A
second case of irregular verb agreement in Modern
Persian involves what is commonly known as the ex-
istential verb <u>häst</u>. As shown in (37a-b), <u>häst</u> is
invariable in morphology, agreeing with neither
inanimate nor animate nominals.

(37) a. se-ta ketab tu otaq häst
         3-CL book in room EXIST
         'There are three books in the room.'
     b. se-ta pesär tu otaq häst   .
         3-CL boy in room EXIST
         'There are three boys in the room.'

The Persian sentences in (37a-b) with no verb agreement
contrast with their English translations which show
agreement. The standard analysis of agreement in
English existential constructions claims that the sin-
gle nominals are terminal members of a CHAIN headed by
the expletive <u>there</u> (Chomsky 1986). The plural feature
of the NP is transmitted to the expletive in the
[NP,IP] position which in turn agrees with the verb.
Moreover, as in the treatment of ergative predicates,
the structural Case assigned to the expletive is trans-
ferred to the NP via the CHAIN.

However, this account of the construction with
<u>häst</u> is problematic since there is no verb agreement
with animate nominals in the Persian sentences, in
contrast to the ergative predicates. Several
characteristics of the verb <u>häst</u> indicate that the sen-
tences in (37a-b) do not contain a CHAIN. Language-
particular facts indicate that the single nominals in
(37a-b), like their English counterparts, are not
S-structure [NP,IP]; that the construction in (37a-b)
is not existential in the standard use of the term; and
that the NPs bear the Accusative Case instead of the
Nominative Case.

First, characteristically, sentences with <u>häst</u>
contain a locative phrase, the placement of which sup-

ports the standard assumption that the nominals in
(37a-b) are not in the [NP,IP] position. Generally,
while subcategorized PPs may precede an NP complement
of VP, they do not precede the subject (38b).

(38) a. moin be äli ketab__. päs=dad
        Moin to Ali book return=gave:3S
        'Moin returned books to Ali.'
     b. *be äli moin ketab päs=dad
        to Ali Moin book return=gave:3S
        'To Ali, Moin returned books'

Therefore, if the nominals in (37a-b) were in the
[NP,IP] position, they should not be preceded by the
locative phrase. However, (39-40) indicate that the
locative PPs may occur sentence initially suggesting
that the NPs are internal arguments of VP.

(39) tu otaq se-ta ketab häst
     in room 3-CL book EXIST
     'There are three books in the room.'
(40) tu otaq se-ta pesär häst
     in room 3-CL boy EXIST
     'There are three boys in the room.'

A second factor concerns the source of the word
häst. Historically, the predicate is derived from the
copula **budän** 'to be'. The use of **häst** contrasts with
that of the copula in the predicate adjective
construction. Compare sentences (37a-b) above with
(41a-b) below where verb agreement obtains.

(41) a. se-ta ketab tu otaq-änd
        3-CL book in room-be:3P
        'Three books are in the room.'
     b. se-ta pesär tu otaq-änd
        3-CL boy in room-be:3P
        'Three boys are in the room.'

However, in addition to the use of agreement markers in
(41a-b), there is a different interpretation of the NPs
se-ta ketab 'three books' and **se-ta pesär** 'three boys'.
Persian does not have articles by which the definite-
ness of an NP may be marked. Instead it relies on sev-
eral suffixes to delineate the definiteness (and speci-
ficity) of a noun. In the case of (41a-b), the NPs are
indefinite (i.e., no previous referent is presupposed)
and specific. As such the sentences in (41) confirm
the existence of three particular books (41a) and three
particular boys (41b) in a room.

In contrast, the NPs in (37a-b) are indefinite and
nonspecific, with the interpretation that some three
books (37a) and some three boys (37b) are in a room.
The nonspecific reading of the NPs suggests that sen-
tences with **häst** are not existential, since generally
existentiality presupposes the specificity of a noun
(Prince 1983).

A third factor concerns the Case-marking of the
single nominals. Generally , it is assumed that the
NPs in existential constructions bear Nominative Case
even though they do not occur in the [NP,IP]. However,
in the case of Persian sentences with **häst**, there is
evidence that the nominals in (37a-b) are marked with
the abstract Accusative Case. Although, Modern Persian
has a limited number of structural Case markers by
which the abstract Case of a nominal may be determined,
the use of definiteness and specificity markers may
indicate the structural position of an NP. For
example, the plural marker -**ha** is borne by plural
definite NPs (Samiian 1983). Nominals modified by
numerals may occur with -**ha**, although frequently -**ha** is
omitted (42).

(42) a. se-ta ketab   b. se-ta ketab-ha
         3-CL book   3-CL book-PL
         'three books'   'the three books'

The particle -**ra** may mark specific complements of VP.
Browne 1970 characterized the marker as [+specific],
since it could co-occur with the indefinite morpheme -**i**
(43) and the definite plural morpheme -**ha** (44).

(43) a. yek ketab-i-ra xund-äm
         one book-ND-AC read-1S
         I read a book. (specific)
     b. yek ketab-i xund-äm
         one book-ND read-1S
         I read a book. (nonspecific)
(44) a. ketab-ha-ra xund-äm
         book-PL-AC read-1S
         I read the books. (specific)
     b. ketab xund-äm
         book read-1S
         I read books. (nonspecific)

Given the features [±specific] and [±definite], an
NP in Persian may be specified in three ways:[3]

```
(45)              +spec      +spec     -spec
                  +def       -def      -def
      [NP,IP]     -ha        0         0
      [NP,VP]     -ha-ra     -ra       0
```

According to the paradigm in (45), a indefinite but specific subject has no overt markers. The same holds for nonspecific, indefinite subjects and objects. Using nongeneric nominals, we note, however, from sentences (46-48) that nonspecific, indefinite nominals do not occur in subject position (see (48a)). Apparently, subjecthood in Persian implies a certain degree of specificity. In (46a) and (47a), a specific subject may occur in a Passive clause, the corresponding sentence with a nonspecific NP uses the third person plural, which is an impersonal passive form.

(46) [NP,IP] a. se-ta märd-ha košte šod-änd
                   3-CL   man-PL killed PASS-3P
                   'The three men were killed.'
      [NP,VP] b. se-ta märd-ha-ra did-äm
                   3-CL   man-PL-AC saw-1S
                   'I saw the three men.'
(47) [NP,IP] a. se-ta märd košte šod-änd
                   3-CL   man killed PASS-3P
                   'Three men were killed.'
      [NP,VP] b. se-ta märd-ra did-äm
                   3-CL   man-AC saw-1S
                   'I saw three men.'
(48) [NP,IP] a. se-ta märd košt-änd
                   3-CL   man killed-3P
                   '(Some) Three men were killed.'
                   (LIT: They killed three men.)
      [NP,VP] b. se-ta märd did-äm
                   3-CL   man saw-1S
                   'I saw (some) three men.'

This paradigm also obtains with the so-called existential construction. As shown in (49a-b), whenever a specific nominal is used, the agreement bearing forms of the copula budän occur. However, with a nonspecific, indefinite nominal only the impersonal verb häst is possible (49c).

(49)
[+spec, +def] a. se-ta märd-ha tu xiabun-änd
                  3-CL   man-PL in street-3P
                  'The three men are in the street.'
[+spec, -def] b. se-ta märd tu xiabun-änd
                  3-CL   man-PL in street-3P
                  'Three men are in the street.'

[-spec, -def] c. **se-ta märd tu xiabun häst**
                  3-CL   man-PL in street-3P
                  '(Some) Three men are in the street.'

In (49a-b) INFL assigns Nominative Case to **se-ta märd-ha** and **se-ta märd** 'three men' as indicated by the fact that neither NP bear the marker **-ra**. In (46c) however, the nonspecific NP is morphologically ambiguous.

Rather, the similarity of (48a) and (49c) suggests that in Persian nonspecific nominals cannot bear the Nominative Case. As a result, they only appear with a verb which assigns the Accusative Case in order to be visible for θ-role assignment. This explains why non-specific nominals only occur in the third person plural impersonal passive, since the verb is capable of as-signing Accusative Case. Moreover, the same holds for the use of the verb **häst** in (49c). As such, the NPs in (49a-b) and (49c) differ both in specificity and defi-niteness, as well as the structural positions they fill. Therefore, the verb **häst** does not bear agreement markers, since the nominals in (37) and (49c) are [NP,VP] and are not terminals members of a CHAIN.

4. **Conclusion.** In summary, two types of 'exceptional' verb agreement obtain in Modern Persian. The first set includes ergative verbs which do not show agreement with inanimate nominals but do with animate ones. We concluded that the single nominals are complements of V and not subjects. The Nominative Case borne by the nominals, as well as the apparent agreement with animate nouns results from a CHAIN linking the complement with an empty subject. We speculate that the limited cases of agreement with inanimate NPs (6-8) is due to the pervasive use of the ergative con-struction. The second set involved cases of lack of agreement with the verb **häst**, a special form of the copula **budän**. Unlike their ergative counterparts, the nominals in this group bear the Accusative Case.

6. **Endnotes**
1. Verbs which do not show agreement surface in the third person singular.
2. In this construction, both the auxiliary and the main verb bear agreement markers.
3. The feature specification [+definite, +specific], standardly used in studies of Persian, does not coin-cide with some analyses of definiteness and specificity which assume that only indefinite NPs may be specific (Kartunnen 1976, Prince 1983). While this topic cer-tainly warrants further investigation, it is outside the scope of this paper.

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THE PHONOLOGY OF FINAL GLOTTAL STOPS

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0. Introduction

It has been recognized for quite some time that glottal stops have a special status in phonology. Noting that "phonetically, the glottal stop, unreleased, is the negation of all sound whether vocalic or consonantal," Firth (1948:124), for instance, goes on to state that within a given phonological system, glottal stop may function as a "minimum or terminus of a syllable, the beginning and the end, the master or maximum consonant," it may constitute a "metrical pause or rest, a sort of measure of time, a sort of mora or matra," and finally that "it may be all or any of these things, or just a member of the consonant system according to the language." Phonologists are especially familiar with rules that insert glottal stop (henceforth, GS) between vowels or before a word- or phrase-initial vowel. In such cases it can be argued that GS has the "prosodic" function of providing a minimal onset to a syllable that would otherwise not have an onset. While in some languages there are further restrictions on such rules (e.g. restricting their application only to stems or to stressed syllables), it is generally assumed that initial (or prevocalic) GS insertion has to do with syllable structure, and ultimately, with the phonetic motivation for having an onset in every syllable (see Ohala and Kawasaki 1984).

The same has not always been assumed for final GS insertion, the topic of the present paper. When a vowel uttered after pause acquires a preceding GS, the syllable acquires an onset and hence goes from being "more marked" to "less marked" as a syllable. On the other hand, when a vowel uttered before pause acquires a following GS, it appears that the syllable has gone from being "less marked" to "more marked," since, as is well-known, the "unmarked" option is for a syllable to end with a vowel, not with a non-vocalic articulation such as a GS.[1] Recognizing this fact, other explanations have been sought. In this paper I wish to consider some of the properties of final GS. In §1 I briefly review the types of functions that have been or could be ascribed to final GS. In §2 I provide a detailed description of final GS in Dagbani, a Gur language spoken in Northern Ghana, in which the conditons on final GS insertion are particularly complex. In §3 I briefly cite other West African languages known to have complex conditions on final GS. Finally, in §4 I consider diachronic and synchronic implications of these findings.

1. Functions of final glottal stop

In this section I would like to consider the potential "functions" of final GS. For the moment I shall assume that it is correct and fruitful to seek specific

functions for phonological properties, although I shall return to this question more critically in §4. With this assumption, we can then ask: what is the function of final GS in language X? Or, if a single phonological property can have more than one function: what are the functions of final GS in language X? For the purpose of the responding to these questions, I shall now consider in turn the distinctive, demarcative, and expressive functions introduced by the Prague School, as these apply to final GS.

The distinctive function is said to be met by a phonological property which serves to distinguish morphemes, i.e. which is phonemic. In many languages final GS constitutes a member of a consonant system and stands in opposition not only to other consonants, but also in opposition with its absence, as in the following examples from Bamileke-Fe?fe?:

(1)	a.	kõ?	'to rise'	b.	kõ	'to receive'
		ni?	'to pulverize'		ni	'to defecate'
		lû?	'to fish'		lû	'to melt'

In this and most other Grassfields Bantu languages, the final GS is distinctive, i.e. it is unpredictable and must therefore be included in lexical representations.

The demarcative function is met by a phonological property which locates the boundary of a domain, e.g. a final word or phrase boundary. Interestingly, while there are languages that are said to have word- (or stem-) initial GS insertion, where the demarcative function of the GS is to mark the beginning of a word (or stem), I know of no language that has word- (or stem-) final GS insertion. However, numerous languages insert a GS before pause. Thus, Vance (1987:13) states of Tokyo Japanese: "...there is always a non-distinctive glottal stop after a short vowel and before a pause." The same process occurs in Hausa, a Chadic language of Nigeria and environs: "[glottal stop]... is considered as a prosodic feature of pausal position, having some kind of demarcative function" (Newman and van Heuven 1981:13). In these cases the GS is claimed to have the demarcative function of marking pauses. Since these pauses often are at the control of the speaker, it is not surprising that prepausal GS is often (always?) tied in with the so-called expressive function.[2]

In this latter capacity, a phonological property has a pragmatic function, communicating something about the speaker's attitude or about the speech event. Thus, for Tokyo Japanese Vance (1987:12) also states: "...the glottal stop after a short vowel is more salient when a speaker is excited and emphatic."[3] In what he identifies as "middle-class Parisian French," Malécot (1975:51) says that pre-pausal GS "... serves to call attention to a preceding or following element, to abort an unwanted utterance, or to terminate an utterance as quickly as possible in order to get on with the next." In his study, examples appear such as the following:

bon[ʔ]!	oui[ʔ]!	non[ʔ]!	je (ne) veux pas[ʔ]!
good	yes	no	I don't want (t o)

je l'ai vu, enfin[ʔ]…	il était là
I saw him, after all…	he was there

il ne l'a pas fait	parce que[ʔ]…	c'est impossible
he didn't do it	because…	it's impossible

Malécot further notes: "…the overall frequency of occurrence of glottal stop in French varies as a function of sex, age, occupation, speaker's intent, voice level, type of articulation and utterance length" (p.51), suggesting that GS serves exclusively an expressive or INTONATIONAL function in French.

That final GS may not be limited to a single function is seen from Henton and Bladon's (1988) study of creak as a "sociophonetic" marker in British English.[4] These researchers note that "…creak correlates with lateness of position in the sentence, accumulating towards the final syllable where it is greater" (p.20) and conclude: "…since creak rate tended to increase considerably with lateness in the utterance…, our interpretation of the functions of creak includes a demarcative role. The unit demarcated might be sentence-sized; more plausibly, perhaps, the demarcative use of creak could be as a turn-relinquisher in conversation" (p.24). Since male-female differences were noted, Henton and Bladon consider, however, that "creak may be regarded primarily as a marker of male speech" (p.23).

The issue that arises with respect to observations as have just been cited from Tokyo Japanese, French and British English is whether a (phonetic or) phonological property can have more than one function (e.g. both a demarcative and an expressive function in the cases cited). It is tempting, in fact, to view cases of obligatory final GS as arising from the PHONOLOGIZATION of non-obligatory final GS or creak, though as we shall see in §4, this need not be the only source.

In the following section I shall demonstrate from Dagbani, a Gur language spoken in Northern Ghana, that final GS may have such a multiplicity of functions, as defined above, that the whole enterprise of assigning Praguian functions to phonological properties must be called into doubt.

2. Final glottal stop in Dagbani

In a number of West African languages the presence of a final glottal stop is dependent on a combination of phonetic, phonological, morphological, syntactic, semantic and/or pragmatic factors. I have already cited the case of Hausa, a member of the Chadic subfamily of Afro-Asiatic. Although my search has not been exhaustive and although I suspect the phenomenon to be even more widespread, within Niger-Congo, I have found final GS in at least four of the original six (subsequently contested) subfamilies of Greenberg (1966): Fula (Arnott 1970;

McIntosh 1984) in West Atlantic; Akan (Schachter and Fromkin 1968) and Chumburung (Snider 1986) in Kwa; Gokana (Hyman 1983) in Benue-Congo; Kusaal (Spratt and Spratt 1968; England and Ladusaw 1985) and Moba (Rialland 1985) in Gur. In this section I shall provide in some detail the facts surrounding final GS in a third Gur language, Dagbani, and argue that if Praguian functions are relevant at all, final GS in this language will be realized only if a disparate and complex combination of factors coincide.[5] Since there are two sets of factors, one concerning affirmative utterances, one concerning negative utterances, I present each case separately.

2.1. Final GS in affirmative utterances

The first condition that must be met is a phonetic one: GS must precede an actual pause, as in citation forms or at the end of an utterance, e.g.

(2) a. ò ǹ díʔ   'he will eat'   ò ǹ dáʔ   'he will buy'
         ò ǹ tóʔ   'he will tie'   ò ǹ zúʔ   'he will steal'

     b. ò ǹ dí kódù   'he will eat a banana'
         ò ǹ ló kódù   'he will tie a banana'
         ò ǹ dá kódù   'he will buy a banana'
         ò ǹ zú kódù   'he will steal a banana'

In (2a) we see that CV verb roots acquire a final GS when they occur before pause. This GS is absent in (2b), where each verb is followed by the noun object 'banana' (which, as we shall see, lacks a final GS for a systematic reason).

The second, third and fourth conditions are phonological: the prepausal segment must be (a) a vowel; (b) short; and (b) a stem (e.g. non-suffix) vowel. Thus, in (3a) there is no final GS, since the verbs in question do not end in a vowel:[6]

(3) a. ò ǹ dém   'he will play'   ò ǹ cáŋ   'he will go'
         ò ǹ túm   'he will work'   ò ǹ sóŋ   'he will help'

     b. ò ǹ píí   'he will choose'   ò ǹ téé   'he will remember'
         ò ǹ bíí   'he will heat'   ò ǹ néé   'he will slide'

     c. ò ǹ kùh-í 'he will cry'   ò ǹ láb-í 'he will return'
         ò ǹ dóg-í 'he will cook'   ò ǹ kál-í 'he will count'

     d. ò dì yá   'he ate'   ò dir mí 'he is eating'

The GS is missing in (3b) because the stem vowel is long[7], and in (3c) it is missing because the final (short) vowel is not a stem vowel, but rather a suffix. (3d) shows

that certain verbal enclitics also fail to receive a prepausal GS and will thus be analyzed as not constituting stems in their own right.

The fifth condition on final GS is morphological: the prepausal word must be [-N], i.e. must not be nominal in nature. Note first in (4a) that the vast majority of Dagbani nouns (e.g. 139 out of 148 "basic" nouns, or 94%) end in a noun class suffix:

(4) a. tib-lí 'ear'   dár-gú 'ladder'   ti-á 'tree'
        kób-lí 'bone'   gáb-gú 'rope'   bí-á 'child'

   b. zò   'friend'   cf. zò? 'to leave'
       mà   'mother'   cf. mà? 'to cut'
       bá   'father'   cf. bá? 'to ride'
       zà   'millet'

Since the final short vowels in (4a) are suffixal, we do not expect nor obtain prepausal GS. In (4b), however, we observe that the few suffixless nouns having the shape CV fail to acquire a GS, though, as shown, their verbal counterparts do. The generalization is that only words that are [-N] are capable of acquiring final GS (if all other conditions are also met). Similar facts are seen in (5).

(5) a. màni   'me'   tinimá   'us'
        nini   'you sg'   yinimá   'you pl'
        ŋùnà   'him/her'   bìná   'them'
        dìná   'it'

   b. ò ɲèr mà 'he sees me'   ò ɲèr tí 'he sees us'
       ò ɲèr á   'he sees you' ò ɲèr yá 'he sees you pl'
       ò ɲèr ó   'he sees him' ò ɲèr bá 'he sees them'
       ò ɲèr li 'he sees it'

   c. yíl¹ gú zù-gú   'on the horn' (lit. horn's head)
       yíl¹ gú ni   'in the horn' (lit. horn's inside)

   d. títá-lí 'big'   žè-gú 'red'   bàr-á 'sick'
       kàr-li   'fat'   kò-gú 'thin'   jí-á   'short'

In (5a) we see that independent pronouns fail to acquire final GS, as do their clitic object analogues in (5b). In (5c) we see that nominals function as locative postpositions—in the case of ni 'inside,' which lacks a suffix, we see most clearly how its [+N] status inhibits final GS. Finally, (5d) shows that adjectives are [+N] and morphologically indistinguishable from nouns in Dagbani, though apparently no adjective occurs without a suffix in the language.

Having established that [+N] forms are not eligible for final GS, one is tempted to use this observation as a criterion for nominal status in Dagbani. This essentially works, though with some complications. Thus, consider the forms in (6).

(6) a.

yíní? / yínú?	'one'	á-yóbù	'six'
á-yí?	'two'	á-yôb póiŋ	'seven'
á-tá?	'three'	à-níi	'eight'
á-náhí?	'four'	á-wói?	'nine'
á-nú?	'five'	pí-á	'ten'

b.

ŋó?	'this'	ŋó há?	'that'
pé?	'here'	pé há?	'there'

c.

máà	'that' (right there)	lá 'the one in question' (def.)
		-só 'a certain' (indef.)

The numerals one through ten are given in (6a). As seen, most consist of an á-prefix followed by a stem. Given that numerals are [-N], the numerals 'two,' 'three' and 'five' follow from our above account, since they end in a short stem vowel. The numeral 'nine' may also be regular, since the phonetic diphthong [oi] is definitely short (i.e. does not consist of a succession of two full vowels). The numerals 'seven' and 'eight' do not show final GS since they end, respectively, in a nasal vs. a long vowel. This leaves the numerals 'one' and 'four,' which show a GS on their second stem vowel vs. 'six,' which for some reason does not.[8] Finally, the form for 'ten' does not show a final GS because it is [+N], consisting of a stem pí followed by a noun class suffix -á (cf. the corresponding plural form pí-hí, as in píh tá? 'thirty,' lit. tens-three).

In (6b) we see that deictics, which are also [-N] take final GS, though máà in (6c) does not, because it ends in a long vowel. The remaining forms in (6c) do not take GS since neither ends in a stem vowel: -só is a suffix (replacing the inherent noun class suffix on the form to which it suffixes), while lá appears to be an enclitic.

The sixth condition on final GS is pragmatic: declarative mood is required:

(7) a.

ò ǹ dí?	'he will eat'	vs.	ò ǹ dì:	'will he eat?'
ò ǹ ló?	'he will tie'	vs.	ò ǹ lò:	'will he tie?'
ò ǹ dá?	'he will buy'	vs.	ò ǹ dà:	'will he buy?'
ò n zú?	'he will steal'	vs.	ò ǹ zù:	'will he steal?'

b.

ò ǹ dá kò!dú yìnì:	'will he buy one banana?' (yíní? 'one')
ò ǹ dá bà-hí à-tà:	'will he buy three dogs?' (á-tá? 'three')

c.

ò ǹ dá kò! dú ŋò:	'will he buy this banana?' (ŋó? 'this')
ò ǹ dá bà-hí ŋó hà:	'will he buy those dogs? (ŋó há? 'those')

(7) d. ŋùn ɨn dí?   'who ate?'
     dɨn ɨn lú?   'which one fell?'

In (7a) I have contrasted statements (ending in GS) with the corresponding yes-no questions. As seen, the latter end in a L tone, and the final vowel is lengthened (and breathy). (7b,c) show the same lack of final GS on numerals and deictics under question intonation, while (7d) shows that WH-questions, as in English, take declarative intonation, here marked by final GS (and the absence of L tone and final lengthening). Although this is not quite precise, I will refer to the pragmatic condition allowing final GS as "declarative."

To summarize, Dagbani has the rule in (8).

(8) Insert a glottal stop if all of the following conditions are met:

    a. phonetic condition: before pause
    b. phonological conditions: after a short, stem-final vowel
    c. morphological condition: final word is [-N]
    d. pragmatic condition: utterance is "declarative"

This completes the characterization of final GS insertion in affirmative utterances. We turn now to consider final GS in negative utterances.

2.2. Final GS in negative utterances

As complex as the conditions are in (8), they do not suffice to predict all occurrences of final GS. This is because there is a second set of conditions that come to play in negative utterances. As the data in (9) show, a negative (declarative) utterance obligatorily ends in a final GS:

(9) a. ò kù dí?   'he won't eat'   ò kù dá?   'he won't buy'
       ò kù ló?   'he won't tie'   ò kù zú?   'he won't steal'

    b. ò kù dém? 'he won't play'   ò kù cáŋ? 'he won't go'
       ò kù tùm? 'he won't work'   ò kù sóŋ? 'he won't help'

    c. ò kù píí? 'he won't choose' ò kù téé? 'he won't remember'
       ò kù bíí? 'he won't heat'   ò kù néé? 'he won't slide'

    d. ò kù kúh-i? 'he won't cry'   ò kù láb-í? 'he won't return'
       ò kù dòg-i? 'he won't cook' ò kù kál-í? 'he won't count'

    e. ò kù tó zó?   'he won't tie a friend' (zò 'friend')
       ò kù tó kódù?   'he won't tie a banana' (kòdú 'banana')

(9) f. ò kù tó kób-lí?   'he won't tie a bone' (kób-lí 'bone')
ò kù tó gáb-gú?   'he won't tie a rope' (gáb-gú 'rope')
ò kù tó nó-ó?   'he won't tie a chicken' (nó-ó 'chicken')
ò kù tó tí-m̀?   'he won't tie medicine' (ti-m̄ 'medicine')

g. ò kù tó má?   'he won't tie me' (ma 'me')
ò kù tó tí?   'he won't tie us' (ti 'us')
ò kù tó bá?   'he won't tie them' (ba 'them')

In (9a) we see that a prepausal verb of the shape CV acquires a final GS in the negative, just as it had done in the affirmative in (3a). In (9b), however, we see that CVN verbs also acquire a final GS, as do CVV verbs in (9c) and CVC-V verbs in (9d). As will be recalled, these same verbs failed to acquire a final GS in the affirmative in (4a-c). In (9e-g) we see that even [+N] forms acquire a final GS in the negative, whether they are suffixless nouns, as in (9e), suffixed nouns, as in (9f), or pronominal enclitics, as in (9g). In fact, no form escapes prepausal GS in a negative (declarative) utterance in Dagbani.[9]

An important qualification must be made. As seen in (10a), the prepausal form must occur not just in an utterance containing a negative, but more specifically, it must occur within the scope of the negation itself:

(10) a. dò só ŋùn ! bɨ lú ŋmê tí   'a certain man who didn't fall hit us'
b. dò só ŋùn ! bɨ lú?... ŋmê tí   'a certain man who didn't fall... hit us'

In (10a) the negation occurs within the relative clause, and hence the final form tí 'us' of the main clause does not fall within its scope. As seen, there is no final GS. In (10b), where a pause is indicated by the three dots at the end of the relative clause, a GS is observed on lú ? 'fall,' because this form does fall within the scope of the negation.

Consider now what happens when an utterance contains multiple pauses, first in the affirmative in (11).

(11) a. ò ń ɲé dóó nɨ págá nɨ bía   'he will see a man, a woman
     he will see man and woman and child   and a child'

b. ò ń ɲé dóó... nɨ págá... nɨ bía   'he will see a man... a
     he will see man and woman and child   woman... and a child'

In (11a) the whole utterance is given with a single pause at the end, while in (11b) there is a pause after dóó 'man' and another one after págá 'woman.'[10] In no case is there a prepausal GS, since in the affirmative, the prepausal form must be [-N].

Now compare (11) with the corresponding negative utterances in (12).

(12) a. ò kù ɲé dóó béé ! págá béé ! bíá? 'he won't see a man
    he F-NEG see man or woman or child or a woman or a
                                                  child'

    b. ò kù ɲé dóó?... béé ! págá?... béé ! bíá? 'he won't see
       he F-NEG see man or woman or child a man... or
                                                a woman...
                                              or a child'

In (12a), where the sentence occurs with only a pause at the end, there is a single, final GS. In (12b), however, there is a GS marking the pause after both 'man' and 'woman.'[11] In fact, EVERY pause falling under the scope of the negation is marked by GS in Dagbani. Thus, corresponding to the utterance in (13a), which naturally occurs without internal pauses is the less natural utterance in (13b).[12]

(13) a. ò kù ɲé dó ! títálí? 'he won't see a big man'
    he F-NEG see man big

    b. ò kù?... ɲé?... dó?... ! títálí? 'he won't... see... (a) big... man'
     he F-NEG see man big

Since each prepausal form falls within the scope of negation, (13b) contains four GS's, as indicated.

The final factor to be addressed is that GS does not occur in negative yes-no questions:

(14) a. ò kù di: 'won't he eat?'   (cf. (9a))
     ò kù dèm: 'won't he play?'   (cf. (9b))
     ò kù pii: 'won't he choose?'   (cf. (9c))
     ò kù kùhì: 'won't he cry?'   (cf. (9d))

    b. ò kù ɲé dó ! títàli: 'won't he see a big man?' (cf. (13a))
       he F-NEG see man big

What this leaves us with is the following summary in (15).

(15) Insert a final GS if all of the following conditions are met:

    a. phonetic condition: before pause
    b. syntactic condition: final word is within scope of negation[13]
    c. pragmatic condition: "declarative" utterance

We now can combine (8) and (15) as follows:

(16) Insert a final GS if all of the following conditions are met:

    a. phonetic condition: before pause

    b. pragmatic condition: "declarative" utterance

plus either:

    c. syntactic condition: final word is within scope of negation

or:

    d. phonological conditions: after a short, stem-final vowel

    e. morphological condition: final word is [-N]

What (16) reveals is that the phonetic and pragmatic (or intonational) conditions are held constant in all utterances, and combine either with a single syntactic condition (c) or a combination of phonological and morphological conditions (d) and (e).

By far the most intriguing condition is (c), which as far as I know has no parallel in any other language (see however note 18). Final GS has a superficial resemblance to boundary tones, whether they are invariant markers of prosodic domain ends or are chosen from a set of melodies marking different intonations.[14] However, one cannot simply divide (12b) into three intonational phrases (IP's), and mark each "negative IP" with final GS, as in (17a).

(17) a.   [ò kù ɲé dóóʔ]$_{IP}$ [béé ! págáʔ]$_{IP}$ [béé ! bíáʔ]$_{IP}$

    b.   [[[ò kù ɲé dóóʔ]$_{IP}$ béé ! págáʔ]$_{IP}$ béé ! bíáʔ]$_{IP}$

The reason for this is that only the first IP in (17a) is actually marked as negative (by the marker kù). If final GS is a sensitive to the IP domain, and if each utterance is exhaustively divided into IP's according to the strict layer hypothesis (Selkirk 1984; Nespor and Vogel 1986), then the second and third IP's in (17a) must somehow be coindexed with the first IP for scope of negativity. Alternatively, as shown in (17b), the strict layer hypothesis can be discarded in favor of a self-embedded IP structure, where each IP contains the negative element. Neither one of these seems particularly appropriate, given the scope facts in (10a). Since this utterance would constitute a single IP with a negative element in it, but since there is no final GS, there seems to be no escaping the necessity of referring directly to scope of negation in determining the insertion of final GS. Within the model of Selkirk (1986), (negative) final GS is either a mark of intonational phrasing or is inserted by a phonosyntactic rule having direct reference to syntax. In either case, final GS insertion precedes and has nothing to do with prosodic domains.[15]

3. Final GS in other West African languages

As pointed out at the beginning of §2, final GS insertion is widely attested in West African languages and, in some cases, is determined by conditions as varied as in Dagbani. In this section I shall briefly list a few such cases for comparative purposes.

3.1. Hausa (Chadic subfamily of Afro-Asiatic)

In Hausa (Newman and van Heuven 1981), GS is inserted before pause in declarative utterances if the prepausal vowel is: (a) short; or (b) long, if it either (i) belongs to a verb with an all H pattern, or (ii) is the first person singular possessive morpheme.

3.2. Fula (West Atlantic subfamily of Niger-Congo)

In Fula (Arnott 1970; McIntosh 1984), GS is inserted before pause in declarative utterances, roughly as follows: (a) on nouns, adjectives and verbo-nominals; (b) on verbs in non-main clauses; (c) on stative, continuous and subjunctive verbs; (d) on pronouns containing a noun class agreement (e.g. most third person, but not first or second person pronouns). That is, there is no GS on determiners, numerals, pronouns without noun class agreement, adverbs, particles, and most verbs in main clauses and the imperative.

3.3. Gokana (Benue-Congo subfamily of Niger-Congo)

In Gokana (Hyman 1983), GS is inserted before pause in declaratives, roughly as follows: (a) on all nouns of the shape CV, most nouns of the shape CV_iV_i, all nouns of the shape CV_iV_j, unless V_j is /i/, all bisyllabic noun stems except tōgó 'head'; (b) all verbs of the shape CV except dú 'come,' no verb of the shape CVV except nāā 'make, do,' bisyllabic verbs ending in -i (with H tone, but not when -i has M or L tone), never on verbs ending in -(C)a, always with verbs ending in causative -(C)E; (c) deictic 'this' does not take GS, while deictic 'that' does: té i 'this tree' vs. té á? 'that tree.'

From the above we conclude that the insertion of final GS before pause in declarative utterances is widespread in West Africa, but that other phonological, morphological and syntactic conditions often complicate the picture. It is not always clear why these conditions have been imposed, and so we now consider in the final section some thoughts on what may have motivated such complex systems.

4. Historical implications

In the preceding sections we have seen that final GS may be conditioned by a number of disparate factors from all parts of the grammar. Since the common denominator appears to be "before pause in declarative utterances," it is tempting to conclude that such GS's result, historically, from the PHONOLOGIZATION of an intrinsic variation in the speech signal. In the case of prepausal vowels, the speaker is expected to cease voicing with the completion of the vowel. When GS is not present, this cessation is smooth, in many cases giving the impression of a final slight breathiness. On the other hand, when GS is present, the cessation of voicing is abrupt, giving the impression of a non-syllabic articulation, i.e. a final "consonant." Presumably this is an available scenario for the development of extrinsic final GS. It may be the case, for instance, that the final GS of Tokyo Japanese started out more like the final GS of French or the final creakiness of British English (see §1). Thus, extrinsic final GS, originally variable, would come to be required before pause, perhaps with an additional requirement that the final vowel be short, as in Tokyo Japanese, or that it be long, as in Tepehua and Oromo (see note 3).

This historical source does not extend in an obvious way, however, to cases such as Dagbani, Fula and Gokana, whose additional morphological or syntactic conditions on final GS can be quite complex and appear arbitrary from a synchronic perspective. I would like to conclude this study, then, by considering the following two questions: 1) what is the historical source of such grammatically conditioned final GS's? 2) when should final GS be treated as underlying, with an "inverted" rule deleting it in NON-pause environments?

In response to the first question, it should be noted that in Kwa languages located to the South of Dagbani in Ghana, there is considerable evidence that final GS's are "traces" of lost segments. For example, Schachter and Fromkin (1968:204) cite dialectal variants of Akan (Volta-Comoe) such as the following:

(18)

	Akuapem/Asante	Fante	
	[jíri]	[jír ʔ]	'overflow'
	[hὺmî]	[hὺm ʔ]	'breathe'
	[tὺnὺ]	[tὺṅ ʔ]	'forge'

As can clearly be seen, the final GS of Fante (present only before pause) is a trace of a lost final vowel. Similarly, Snider (1986:136) presents the following dialect comparisons within the Guang subgroup of Volta-Comoe:

(19)	Gonja	Chumburung	
	ka-wʊlʔ	wʊrɪ	'skin'
	ku-fulʔ	kɨ-furi	'moon'
	e-ɲinʔ	ɔ-ɲarɪ	'man'

Schachter and Fromkin (1968:83) also show that final GS can correspond to the loss of a final consonant, such as [w].[16]   If one historical source of final GS is the "phonologization of pause," then a second source is the "reduction" of a final segment.[17] It is distinctly possible, in fact, that the GS found in affirmatives in Dagbani, with its phonological and morphological conditions, comes from this second historical source.

Having raised the possibility that final GS may be the reflex of an historical segment, either consonant or vowel, we now turn to the second question raised above: when should GS be set up underlyingly, with a rule of GS deletion? After deriving final GS from other segments, Schachter and Fromkin (1968:84) proposed the following rule of GS deletion:

(20) [+glottal constriction] —> Ø / ___ X   (where X is not a pause boundary)

To consider whether a similar analysis might be feasable in Dagbani, consider what Snider (1986:133-4) says concerning final GS in Chumburung: "I include it in the underlying forms... for two reasons: (1) it is distinctive, and (2) it blocks vowel coalescence." As for the first point, Snider cites the Chumburung minimal pairs in (21).

(21) a.	dá	'to hit'	b.	dáʔ	'older brother'
	kɔ̀	'to fight'		kɔ̀ʔ	'to defecate'
	tè	'to sit'		tèʔ	'to pluck'

Unlike Dagbani, whose minimal pairs were seen in (4b), the minimal pairs in Chumburung may belong to the same form class, e.g. five out of the above six forms are verbs. Concerning the second reason Snider gives for underlying final GS, consider (22).

(22)	a.	/tɔ ɪsaanɪ/	→	t˘ɛsaanɪ	'to roast a sheep'
	b.	/dɔʔ ɪsɪ/	→	duwɛsɪ	'to hoe soil'

In (22a), where the vowels /ɔ/ and /ɪ/ occur in immediate succession, we observe vowel coalescence. In (22b), however, where the same vowels are separated by the proposed underlying GS, vowel coalescence is blocked—instead, a [w] is observed in its place (suggesting, in fact, that GS may simply be an empty "C slot" or equivalent in underlying forms). It therefore seems that Snider's analysis of

underlying GS is unavoidable and that final GS will have a different analysis in different languages, depending on such facts.

The Dagbani situation is one where all occurrences of GS can be predicted, though as we have seen, by a combination of factors. It is therefore unnecessary and undesirable to posit underlying GS's, especially when one considers that the GS-deletion rule that would be required (identical to the Akan rule in (20)) would delete GS when followed either by a consonant OR a vowel. While the former is phonetically motivated, it is not clear why a GS should delete intervocalically—in many languages, in fact, GS is inserted to break up just such a hiatus. We therefore conclude that GS is inserted by a complicated postlexical rule in Dagbani, as summarized in (16).

Since I opened this paper with a discussion of the different functions a GS potentially may fulfill, it is appropriate to end with a reconsider of function in the Dagbani case. Clearly GS is not distinctive in this language, if by distinctive we mean "unpredictable." Since it requires a stem vowel, it could be argued to have a demarcative "accentual" function marking stems, or since it occurs exclusively before pause, it could be argued to have a demarcative "intonational" function marking pause, or perhaps the end of an intonational phrase, within declarative utterances. However, since so many other factors are required, these demarcative functions are imperfect, at best. In the affirmative, where the prepausal word must also be [-N], would we want to add that GS has the "morphological" function of marking non-nominals? It seems unlikely, in fact, that GS came in with a distinct function (or functions) in mind.

Which brings us to the marking of prepausal GS under the scope of negation. Here one might claim that GS has the "syntactic" (semantic?) function of marking negation. It does not seem far-fetched to label this GS as a negative intonation marker, just as it is reasonable to identify final GS as a declarative intonation marker. An intriguing question, however, is how the negative GS may have come into being. Many languages, including Hausa, have a (second) negative marker at the end of the negated clause, from which a GS could have derived, historically, in Dagbani.[18] While the multiple occurrences seen at the end of each disjunct in (12b) could conceivably have been derived, individually, from this hypothetical (segmental) negative marker, it seems impossible that the multiple occurrences of GS in (13b) could be direct reflexes of the marker. Assuming that it had a shape such as [ba], for instance, it would seem very odd that multiple [ba]'s would ever have been required in the historical antecedent to (13b), where a pause is placed essentially after every word. In fact, I would claim that the same would be true in (13b) if negation were marked, say, by -k rather than by -?. In other words, I believe that despite the complexity of the system, GS is subject to a "prosodic" interpretation that is not available for either -k or -ba and hence, unlike

the latter, can be generalized to "unnatural pauses" such as in (13b). In other words, we must allow for GS to have the same potential functions as other prosodic features: tone, stress, duration. What these prosodic features have in common, of course, is that they lack a supralaryngeal articulation. Accordingly, they can be superimposed or produced in parallel with any consonant or vowel articulation with which they are physically compatible. To develop further the opening quotation from Firth (1948), we can say that speakers may interpret GS either "paradigmatically" in opposition to other consonants of a phonological system, or "syntagmatically" as a timing gesture affecting the laryngeal node. Prepausal GS is thus "prosodic" in a way that supralaryngeal consonants cannot be.[19]

NOTES

[1]Throughout this paper I will be using the term "glottal stop" (or GS) to refer not only to actual glottal stops, where closure of the vocal cords is complete, but also to glottalization, where closure may not be complete. I am hence interested in the phonology of final glottality per se, independently of its exact phonetic realization, which may vary according to speaker, style, and/or language.

[2]I have omitted from consideration discussion of the so-called culminative function, which is met when a phonological property identifies the number of units or domains (e.g. words) present in a string. Originally applied to characterize languages with so-called free stress-accent, it is potentially applicable to GS as well, e.g. Merlan (1982:183) says of Mangarayi, an Australian language: "No word contains more than one glottal stop," excepting certain reduplications. It is not clear if this function is ever relevant to final GS.

[3]Perhaps it should be noted at this point that prepausal GS is often limited to cases where the final vowel is short, as in Tokyo Japanese and (with some exceptions) in Hausa. In other languages such as Tepehua (Jim Watters, p.c.) and Oromo (Paul Newman, p.c.), prepausal GS is found only when the final vowel is long: in both languages, the final long vowel will surface as a short vowel followed by a GS, while a final short vowel will be devoiced.

[4]As stated in note 1, we need not be concerned with whether final glottality involves complete closure of the vocal cords (i.e. GS) or not (e.g. creak).

[5]The data come from the speech of Mr. Abdul Saedu, from Tamale, Ghana, who served as informant during a field methods course in Spring semester, 1988, at the University of Southern California. I am grateful to Mr. Saedu, who also met extensively with me subsequently, and also to the members of the field methods course who provided helpful comments and stimulation throughout our joint study of Dagbani phonology and grammar.

[6]These verbs have the less frequent alternants [demi, tumi, caɲi, soɲi] , which also do not acquire a final GS, since the final [i] is not a stem vowel.

[7]The second mora of each vowel is unambiguously part of the stem, not a suffix.

[8]Unless the absence of GS can be attributed to tone ('six' ends in a L tone, while 'one' and 'four' end in H tone), 'six' may simply have to be marked with the exception feature [-GS]. It might be noted in this context that GS is less salient to my ears when it accompanies final L tone than when it occurs on final H tone.

[9]This includes the word īhī? 'no,' which requires a final GS, though, interestingly, the corresponding word īī 'yes' occurs without final GS.

[10]These internal pauses have two effects. First, the rule of H tone spreading that takes place from dóó and from págá onto /n ɨ/, creating a HL falling tone in (11a) is blocked from applying by the pauses in (11b). Second, although not transcribed, the last of a sequence of H tones is lowered to M(id) before pause in Dagbani. Thus, 'child' is pronounced bíá in (11a) and (11b). In (11b), but not in (11a), 'man' is pronounced dóó, and 'woman' is pronounced págá.

[11]As in the case of the corresponding affirmative (see note 10), these words are also characterized by a HM tonal contour before pause, i.e. dóó? and págá?.

[12]Utterances such as these were inadvertently discovered in the following way. In the Field Methods course we initially experienced difficulty hearing the tones. To aid us in our transcriptions, we asked the informant to slow the utterance down as much as possible. He then provided the indicated pauses, and we discovered particularly in the negative that this produced multiple GS's. Afterwards we asked for even more pauses than he originally offered and found, for instance, that when forced to pause within a word, e.g. ko... du... 'banana,' an internal GS was never given, even under negation. It may be, then, that among other things, final GS can only target a right (word) bracket.

[13]Actually, there may be some question as to whether this is a syntactic or a semantic condition. I have tried, but failed, to elicit GS differences in ambiguous cases such as the famous "I don't beat my wife because I love her." I will here simply assume that this condition is syntactic in nature.

[14]For an interesting tonal parallel to the negative scope condition on final GS in Dagbani, see Hyman (to appear).

[15]I do not think that the theory of "precompilation" proposed by Hayes (to appear) is appropriate in this case. First, if final GS were lexical, it would violate structure preservation, since there is otherwise no final GS in the language. (It is doubtful also whether there is any lexical GS at all in Dagbani, since the only other occurrence comes from the insertion of GS in the environment / [___ V, a second source of GS shared by most (all?) of the languages surveyed in this paper.) Hayes cites examples from Hausa and Kimatuumbi where the rule in question must precede other clearly lexical rules. In the case of Dagbani, the rule of final GS insertion, if lexical, would have to be postcyclic and is followed by no other lexical rule.

[16]Schachter and Fromkin actually derive this [w] from underlying /p/, though this need not concern us here.

[17]Alternatively conceptualized as leaving a glottal "trace" where a full segment once stood. This is reminiscent of the function of GS in Makassarese reduplication. Aronoff et al (1987)

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demonstrate that reduplication in this language is accomplished by a two-syllable prefix, e.g. bátu 'stone' becomes batu-bátu 'small stone(s),' gólla 'sugar' becomes golla-gólla 'sweets' and so forth. Where the base noun has itself more than two syllables, e.g. manára 'tower' and baláo 'rat,' we obtain mana?-manára 'sort of tower' and bala?-baláo 'toy rat.' In these cases the GS is the sign of truncation, i.e. hypothetical *manara-manára becomes mana?-manára. Could this GS be related to the GS "marking" final segment deletion in the Volta-Comoe languages?

[18]The alternative is to see GS as being "phonologized" preferentially in the negative. This may also be plausible, given that lots of West African languages highlight negation prosodically, e.g. "In various languages an extra-high tone occurs, contrastively, but limited perhaps to the negative and a few other places" (Pike 1970:97). For example, in Gwari, "In negative sentences the whole level of the tonal contour is raised, such that lower-mid becomes mid, mid becomes high and high becomes super high tone" (Hyman and Magaji 1970:118). In addition, Hyman and Watters (1984) and Marchese (1983) document the widespread natural class formed by negatives and imperatives, which are said to be "intrinsically focused." It is interesting in this connection to cite the case of Lahu, where imperatives acquire a final GS, which Matisoff (1973:353) considers an intonation.

[19]Left out of the picture and subject to further investigation are features that involve supralaryngeal articulation, but which have been shown to function as "prosodies," e.g. nasalization, vowel harmony, or major features such as [cons], [son] or [cont].

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Not All Utterances Are Sentences

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1. Introduction

This paper is meant to address the publicized theme of this conference: "Sentence-Based Grammars: Pro and Con". It does not argue against sentence-based grammars or sentential syntax; it assumes them. Rather, it addresses the issue of whether the category sentence (S)[1] is the *designated start symbol* of a grammar. "Designated start symbol" is a concept in early generative grammar that was derived from formal language theory.[2] It is the category symbol in a grammar that is distinguished by two properties:

1. Every string in the language generated by the grammar is of that category.
2. It is not recursive.

In the body of this paper, I will address the issue of whether there is a designated start symbol and, if so, what it is. Section 2 sketches out the history of S as designated start symbol. Section 3 presents syntactic arguments that there are certain utterances that are not S's at any level of representation. Section 4 argues for the existence of another category, *Utterance*, as designated start symbol on the basis of semantic considerations. Section 5 presents other aspects of Utterance's behavior. Finally, section 6 summarizes the conclusions of this work and presents arguments for modifying the conclusions of Sections 4 and 5.

2. S as Designated Start Symbol

In the earliest days of transformational grammar, the category S was the designated start symbol. This can be seen from the following quotations:

1. "*S* is the unique prime that represents every grammatical string." (Chomsky (1955, Section 50.2))[3]
2. "... all recursions drop from the kernel grammar." (Chomsky (1955, Section 105.2))

In fact, not only was recursion of S eliminated from the "kernel grammar" (or, as we would now say, "from the base"), there was also no recursion for NP, as well. Since there is clearly superficial recursion in English and other natural languages, recursion had to be placed in another component of grammar, and, in fact, it was reserved to the transformational component. This was done by two types of transformations:

Generalized transformations
which embedded basic sentences—"kernel sentences" as they were called at the time—one inside the other, inserting the appropriate complementizers, etc. (Chomsky (1955, Section 91.1ff))

Nominalization transformations
which transformed underlying sentences into derived nominals. (Chomsky (1955, Section 99.6ff; Section 107ff); Lees (1960))

Gradually recursion was placed back in the base. The first move was the elimination of generalized transformations (Chomsky (1965) and (1966, especially p. 63)) Generalized transformations were eliminated for several reasons; chief among them

was the problem of rule ordering—or what Lees (1960) called "traffic rules". The system of generalized transformations allowed certain rule orderings that were not actually realized. Allowing recursion of S in the base and adopting the principle of cyclic rule ordering constituted a more restrictive theory.

Finally, Chomsky (1970) argued forcefully for the elimination of nominalization transformations and introduced X-Bar syntax to capture cross-categorial generalizations in their place. However, even though one of the distinguishing characteristics of the designated start symbol—the non-recursive property—had been done away with, it still was assumed then, and now, that S represents every grammatical string. However, Chomsky (1977) briefly considered a theory that included what was, in effect, a designated start symbol. Though this suggestion is not currently accepted, I will discuss it briefly before turning back to the present state of affairs.

Chomsky (1977, pp. 90--97), influenced by work by Banfield (1973)[4], proposed a base-generated theory of topicalization and left dislocation that incorporated the rules R1 and R2 in (1) to handle examples such as those in (2). Under this analysis, the topicalized or dislocated constituent is base-generated under TOP.

(1) R1: $\overline{\overline{S}} \rightarrow$ TOP $\overline{S}$

    R2: $\overline{S} \rightarrow$ COMP S

(2) as for this book, I think you should read it

    this book, I really like

Note that, given R1 and R2, the proposed $\overline{\overline{S}}$ category constitutes the designated start symbol, since it represents all grammatical strings and is non-recursive. However, Chomsky (1977, p. 91), after considering examples such as (3), points out that "If such structures are to be permitted...", R2 must be modified to allow $\overline{S}$ to be recursive (4).

(3) I informed the students that as far as this book is concerned, they would definitely have to read it

(4) R2: $\overline{S} \rightarrow$ COMP $\left\{ \begin{matrix} \overline{\overline{S}} \\ S \end{matrix} \right\}$

Thus, though Chomsky briefly considered an analysis with $\overline{\overline{S}}$ as the designated start symbol, he eventually allowed it to be recursive. Moreover, $\overline{\overline{S}}$ is no longer part of current syntactic theory; however, this analysis does represent an interesting resurgence of the designated start symbol.

Given this background, we can now turn to the question:

(5) Is there a designated start symbol?

which, in turn, breaks down into two subquestions for the purposes of this discussion:

    1. Can there be primes other than S that represent grammatical strings?
    2. Is there a unique prime that represents every grammatical string?

Section 3 presents syntactic evidence that the answer to question 1. is "yes". Section 4 presents more semantically-based evidence that the answer to question 2. is also "yes". Before entering into the principle arguments for these positions, I will point out that the answers to these two questions are in fact based on the experience that we (Ayuso, et al. (1988)) have had building The BBN Spoken Language System (SLS)—a computer program for understanding spoken and written natural language input.

3. Non-Sentential Utterances

(6) through (8) present utterances which are spoken (or typed) by one participant in a dialogue. The (a) utterance of each example is an initial query; the (b) utterance is a followup query, after some response has been made by the other participant in the dialogue (be it person or machine); the (c) example shows the elements that must be supplied in each (b) utterance, if it is derived from the previous (a) utterance by ellipsis.

(6) a. List the ships in the Puget Sound   (9) $[_{VP}$ V NP]
    b. The ships in SD   ↓
    c. [List] the ships in SD   ∅
(7) a. Which ships for each type are C5   (10) $[_S$ NP V ADJP]
    b. C4   ↓   ↓
    c. [Which ships for each type are] C4   ∅   ∅
(8) a. What platforms are in the Subic Bay[5]   (11) $[_S$ NP V P NP]
    b. Diego Garcia   ↓   ↓↓
    c. [What platforms are in] Diego Garcia   ∅   ∅∅

(9) through (11) present schemata for the rules—whether interpretive or deletion—that would be necessary to derive each (b) utterance from the preceding (a) utterance. Clearly, these are only a small subset of the sorts of deletion rules that would be necessary, because, in general, any major category can be elided in any position in a sentence. Therefore, any ellipsis[6] analysis of examples (6) through (8), and of the larger phenomenon of which they are merely illustrative, will have two properties.

    1. A large number of rules is required.
    2. Each of these rules must be able to elide non-constituents.

Taken together, these two properties argue against an ellipsis analysis of utterances which are non-clausal, but which still constitute complete constituents. Of these two properties, the second is clearly more important. One cannot rule out the possiblity of collapsing such rules into a single rule or rule schema, so arguments based on the number of such rules may merely represent the limits of our ingenuity or our current notation, rather than any more serious problem. However, the fact that the elided material cannot be limited to constituents is a substantive objection. Note, for example, in (10), that the sequence NP V is elided, while in (11), NP V P is elided. In each case, the sequence is a non-constituent. Even rule (9) is but a special case of a more general process which also elides non-constituents:

(12) a. List the ships in the Puget Sound   (13) $[_{VP}$ V NP ADVP]
       yesterday   ↓   ↓
    b. The ships in SD   ∅   ∅
    c. [List] the ships in SD [yesterday]

In (13) it is not merely a non constituent sequence, but a non-contiguous sequence that must be elided, under an ellipsis analysis. The rules in (10) and (11) must also be so extended, since they can also apply when an adjunct is added. The real problem with an ellipsis analysis of non-clausal utterances, then, is the fact that ellipsis must perform a string operation; the essence of all the rule schemata presented here is that one constituent is "picked out", as it were, and the rest of the terminal string, *regardless of constituency*, is elided. One aspect of linguistice analysis proposed in the earliest work in generative grammar, and still accepted, even in non-transformational theories such as LFG and GPSG, is the structure-dependence of rules: linguistic processes operate on constituents, not on arbitrary strings. Thus, we have a very strong argument against an ellipsis analysis of non-clausal constituent utterances.

Further evidence along the same lines is provided by (14), which is slightly different from the others: here the (a) utterance is uttered by one participant in a dialogue, while (b) is uttered by another.

(14) a. How angry is John   (15) [$_S$ NP V very $\overline{ADJ}$]
     b. Very/*So/*That/*As   ↓   ↓   ↓
     c. [John is] very [angry]   ∅   ∅   ∅

While the adjectival specifier "very" is grammatical, other specifiers ("so", "that", or "as"), which can normally appear in the same position in an overt adjective phrase, are not. This makes an ellipsis analysis of (14b) very dubious; not only must rule (15) elide a non-constituent, non-contiguous sequence, the non-elided element is a specified formative. While a rule permitting the adjectival specifier "very" to constitute a complete utterance is idiosyncratic, idiosyncratic rules introducing specific lexical items and formatives are well-attested.

As a final argument against deriving all utterances by ellipsis from S,[7] let us consider the utterances in (16).

(16) a. No.
     b. Yes.
     c. Over and out.

While "no" and "yes" can appear with full sentences, they need not; and "over and out" never appears in a sentence, other than in direct discourse. A theory that insists that every utterance is a sentence at some level, requires the existence of a diacritic feature that triggers the ellipsis of all other constituents in the sentence—optionally in the case of "yes" and "no", obligatorily in the case "over and out". There is also the question of what category these elements belong to in the first place, since they do not appear in the position of either major categories or specifiers and so do not seem to belong to any independently motivated category.

Before leaving this section, I will point out that the argument against deriving non-clausal, but complete constituent, utterances by ellipsis, is not meant to deny that there are cases of ellipsis, such as VP ellipsis, as in (17):

(17) A: John won't wash the dishes.
     B: I bet he will ∅, if you're nice to him.

The main difference between (6)--(8), (12), and (14), on the one hand, and (17), on the other, is that the former examples are complete constituents that can only be derived from an S, in the general case at least, by ellipsis of non-constituents; while the latter case is an utterance that is not a single constituent, but which can be derived from a full S by the ellipsis of a constituent.[8] This gives us a good criterion for distinguishing between cases of ellipsis and cases of base generation: when the elided material forms a constituent, there is ellipsis; when it does not, there is base generation.

4. Speech Acts

The arguments presented in the previous section have only shown that there are grammatical utterances that are not Ss at any level of derivation. I have not yet shown that there is any other category that replaces S as designated start symbol. The data in Section 3 could be equally well captured in an analysis that allows all major categories (and perhaps some minor categories and specified formatives like "very") to constitute complete utterances. In this section, I will present arguments that there is a linguistic prime that represents all grammatical utterances.[9] The arguments will be based on data concerning *speech acts* (Searle (1969)).

We begin this discussion by considering the distinction between *propositional content* and *illocutionary force*, which is illustrated by the examples in (18) through (21).

(18) a. Vinson is going to Tokyo.
   b. (assert (equal (destination-of Vinson) Tokyo))
(19) a. Is Vinson going to Tokyo?
   b. (query (equal (destination-of Vinson) Tokyo))
(20) a. Have Vinson go to Tokyo!
   b. (bring-about (equal (destination-of Vinson) Tokyo)))
(21) a. Who is going to Tokyo?
   b. (query (set x agents (equal (destination-of x) Tokyo)))

(18a) is a declarative sentence, (19a) an interrogative, and (20a) an imperative. Their respective semantic translations[10] in (18b), (19b), and (20b) all contain the sub-expresion **(equal (destination-of Vinson) Tokyo)**.[11] This sub-expression represents the common propositional content of the three utterances (18a), (19a), and (20a). However, the illocutionary force—the use to which this propositional content is put—is different in these three utterances. One way of expressing this difference—the way that is adopted in our system—is to "wrap" an operator indicating the type of illocutionary force around the expression denoting the propositional content. Such operators are often called *speech act operators*. In (18a), the declarative sentence, the propositional content is asserted—indicated by the **assert** operator; in (19a), the interrogative, its truth is being questioned—indicated by the **query** operator; and in (20a), the imperative, the propositional content is a state of affairs that the speaker wishes to obtain—indicated by the **bring-about** operator. Finally, (21a) is a content question asking for the individual(s) going to Tokyo. This is represented in (21b), where the **query** operator is wrapped around an expression denoting the set of all objects, **x**, such that the destination of each object is Tokyo.

We next turn to the mechanism by which speech acts are assigned to utterances; it is data from this area that will provide evidence for a designated start symbol, distinct from S. There are two characteristics of speech act assignment that are relevant to the present discussion:

(22) **Speech Act Assignment:**

   1. Speech acts are assigned to entire utterances, not to sub-parts; speech act assignment is non-recursive.
   2. Non-sentential utterances are assigned speech acts, but not when part of larger constituent.

Statement 1 of (22) rules out the assignment of speech acts to embedded constituents, as illustrated in (23).

(23) *(assert ... (assert ...))
   *(assert ... (query ...))
   *(query ... (assert ...))
   *(query ... (query ...))
   ...

Still stronger conditions might be placed on speech act assignment:

1. There is only one speech act for each utterance.
2. Speech act assignment uses only top-level (e.g. matrix clause) information.

While these two restrictions seem to characterize the typical cases of speech act assignment, they seem to be too strong for the general case. Only recursive assignment will be forbidden. However, it is necessary to consider the data that supports the

conditions on speech act assignment adopted here, since they might also be taken to argue against the prohibition on recursive speech act assignment.

The first phenomenon motivating the retreat to the weaker position is tags:

(24) John is here, isn't he
    John isn't here, is he
    John is here, is he
    John is here, he is

Such examples seem to indicate that there can be more than one speech act at top level or that there can be composite speech acts, composed from the speech act of the main clause of the tag and that of the tag proper. This issue does not need to be resolved here; note that even if the composite or multiple speech act analysis is correct, speech act assignment is still based on top level information, and, more importantly, there is no recursion of speech acts.

Another construction that argues for (22) is factives, as in (25).

(25) a. I regret that John is here
    b. Conjunction of assertions: I regret that John is here
                                  John is here

Geach (1972, pp. 22ff; pp 261ff) maintains that factives contain what he calls a "double barrelled assertion"; that is, the interpretation of a factive sentence, such as (25a), is actually a conjunction of assertions, as illustrated in (25b). Again, the question of whether Geach's claim is correct or not does not affect the prohibition against recursion of speech acts; even it is true, it still does not motivate dropping the non-recursion constraint. It is this prohibition that is crucial for the arguments in this section.

Statement 2 of (22) makes the claim that non-sentential utterances are also assigned speech acts but that, just as there is no recursion of speech act assignment for sentential utterances, the constituents that can form non-sentential utterances are not assigned speech acts when they are contained in sentences. Consider the NP utterance "the window", which can be associated with different tunes (intonational patterns):

(26) a. the window   L* H H%   query
     b. the window   H* L L%   declarative/imperative

Hirschberg and Pierrehumbert (1986, p. 139) have claimed that "Roughly speaking, the tune appears to convey information about speaker attitudes and intentions (as, the speech act the speaker intends to perform)..." If this is true, then the fact that non-sentential utterances can be assigned different tunes indicates that they can be assigned speech acts.[12] Here, (26a) has the rise-fall-rise tune that Hirshberg and Pierrehumbert, among others consider characteristic of interrogatives, while (26b) has the tune with final fall characteristic of declaratives and imperatives. If the claim made here that non-sentential utterances are assigned speech acts is true, it is necessary to specify how this assignment takes place.

To deal with speech act assignment, I will postulate the existence of the category UTTERANCE that has the following properties:

    1. It is the designated start symbol of a grammar.
    2. It is the constituent to which speech acts are assigned.

If UTTERANCE is indeed the designated start symbol and also the constituent to which speech acts are assigned, then a number of facts are explained. Since the designated start symbol is not recursive, the fact that speech act assignment is not recursive follows. Since non-clausal constituents can only receive speech acts when they are immediate dependents of UTTERANCE, the fact that they do not receive speech acts when they are children of S also follows.

I will now sketch out how speech acts are assigned to clausal utterances and a subset of non-clausal utterances in the BBN SLS and how this procedure might be generalized to handle the full range of non-clausal utterances. Before describing the actual procedure that is used, it is necessary to present a brief overview of the architecture of the system, in particular, the *multi-level semantics*. This architecture, which is shown in Figure 4-1, was originally developed in the PHLIQA question-answering system, designed at Phillips in the Netherlands (Bronnenberg, et al (1980)).

WORD SEQUENCE
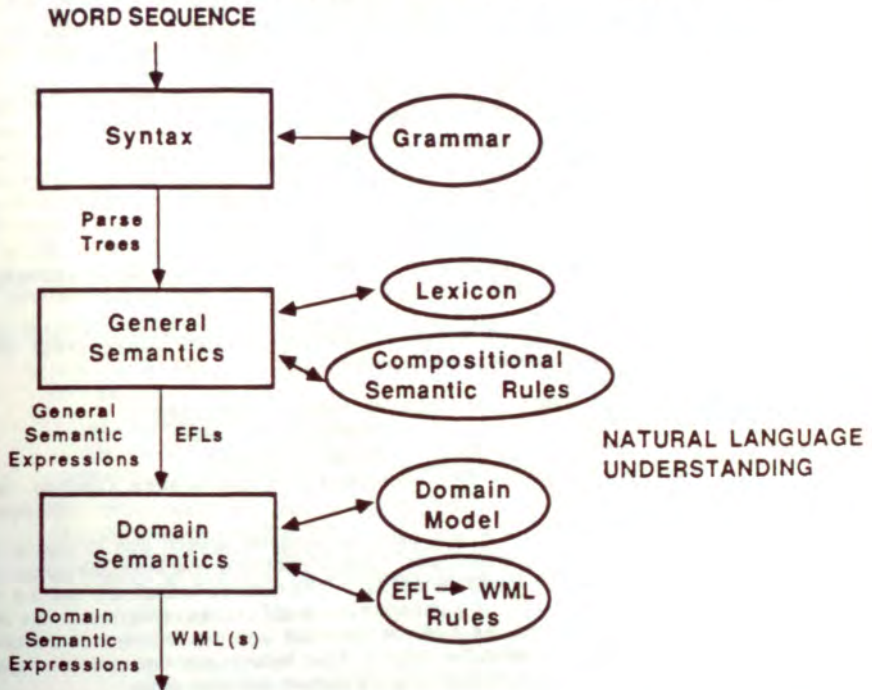
Figure 4-1: A Multi-Level Semantics Architecture

In this architecture, processing proceeds in several stages. An input utterance is first passed to the syntactic component, the parser, which, using a grammar and lexicon, assigns to that utterance, a parse tree, or, perhaps, more than one parse tree, in the case of ambiguity. The parse tree or parse trees are passed to what is labelled the general semantics component. It is called general semantics because this component is responsible for computing the non-domain specific aspects of meaning of an utterance; i.e. those that follow from the general rules of composition of the language, rather than from lexical idiosyncracies. At this stage, each parse tree is assigned a single semantic representation in a logical language called EFL (for English-Oriented Formal Language). EFL representations have two distinguishing properties: (1) they represent basic function-argument relationships; and (2) they can contain ambiguous constants. One use of this property is for representing lexical ambiguity. For example, the English word "bank" can be either a financial institution or the bank of a river. At EFL the lexical item "bank" is assigned a single constant, which is ambiguous between those two readings. EFL

expressions are passed to the component labelled Domain Semantics, which utilizes domain and lexical specific information. Representations at this level are in a logical language called WML (for World Model Language). In the mapping from EFL to WML, ambiguous EFL constants are disambiguated, wherever possible. For instance, given our example with "bank", this component might, using the semantic type constraints of the context in which "bank" appeared, determine whether it was indeed the financial institution use, the river bank usage, or whether it remained ambiguous. If disambiguation is possible, each EFL expression will produce a single WML expression for an EFL; if it is not, each EFL expression will produce as many WML expressions as there are ambiguities.

Given this background, we can now turn to the question of how speech act assignment is done in this architecture.

(27) Speech act assignment procedure for clausal utterances:

Speech act is assigned on the basis of mood and WH

```
(((UTTERANCE)
  (S (0COMP) (INDICATIVE :TENSE) (WH-) (NIL) (NIL) :CONJA))
 semantics (lambda (x) (assert x)))
(((UTTERANCE)
  (S (0COMP) (INDICATIVE :TENSE) (WH+ (QWH) :TRX) (NIL) (NIL) :CONJA)
 semantics (lambda (x) (query x)))
(((UTTERANCE)
  (VP (AGR (2ND) :N) (REALNP :REAL) (IMPERATIVE)
      (AUXV (W (W (W (W (W (0AUX)))))) :NEG)
      (WH-) (NIL) (NIL) :CONTRACT :CONJA))
 semantics (lambda (vp) (bring-about (intension (lambda (x)
                                          things (vp x)))))
```

(27) gives the criteria used for assigning speech acts to clausal utterances, followed by the three actual rules[13] from the grammar that introduce clausal utterances, along with their associated semantics.[14] The features in each rule that are relevant for speech act assignment are underlined. As (27) states, speech acts are assigned to clausal utterances on the basis of the mood and the WH-ness of the clause. The correspondence between the value of these features and the associated speech act is implicit in the grammar rules in (27) and is made explicit in (28).

(28)	−WH	+WH
INDICATIVE	assert	query
IMPERATIVE	bring-about	[Non-existent]

Each grammar rule in (27) will produce an EFL representation containing the speech act of the associated **semantics** field. In the typical case, the EFL to WML translation rules apply vacuously in the case of speech acts, so that the speech act of an utterance is the same at the EFL and WML levels. However, there are also cases of *indirect speech acts* (Searle (1975), Davison (1975)) in which there are different speech acts at EFL and WML. (29) presents such an example:

(29) a. Tell me whether Vinson is going to Tokyo
b. EFL: (bring-about (lambda x (tell x me (equal (destination-of Vinson) Tokyo))))
c. WML: (query (equal (destination-of Vinson) Tokyo))

On the basis of sentential syntax alone, sentence (29a) is assigned the speech

act **BRING-ABOUT** at EFL, since the sentence is an imperative. However, the real communicative core of this sentence is equivalent to the question "Is Vinson going to Tokyo?" There are translation rules in the system to detect this sort of situation and produce a corresponding WML representation in which the speech act is **QUERY** and the semantically extraneous elements are discarded.

With this discussion of the procedure for assigning speech acts to clausal utterances as background, we can now turn to the procedure for assigning speech acts to non-clausal utterances. At present, non-clausal utterances are uniformly assigned the speech act of **QUERY**. The reason for this is two-fold: (1) the application in which our system is being used is one in which a user queries a database, so utterances typically *are* queries; and (2) non-clausal utterances are only created by the user of the system, as a follow-up to a preceding query. Thus, the restriction of the speech act of non-clausal utterances to **QUERY** makes sense for this application, but it is not general enough. As linguists, we demand a more general approach that meets the criterion of both descriptive and explanatory adequacy. As computer scientists, we would prefer a more general approach that can extend to other domains and other applications; for example, this treatment of speech act assignment to non-clausal utterances will not even extend to a related application in which a user adds information to a database using typed or spoken input. (30) sketches a more general procedure for the assignment of speech acts to non-clausal utterances.

(30) Speech act assignment procedure for non-clausal utterances:

1. Non-clausal utterances are assigned an ambiguous EFL speech act constant, e.g.:

   ```
   (((UTTERANCE)
     (NP ...)
   semantics (lambda (x) (EFL-speech-act x)))
   ```

2. For spoken utterances, use the intonation contour ("tune") of the utterance to assign it a speech act at WML.
3. For written utterances, use the speech act of a previous utterance to assign it a speech act at WML. There are several cases:[15]

   a. In a situation where one participant in a discourse is the active participant, as in a case where one speaker is asking the other for information (e.g. in a computer system or other information gathering context), use the speech act and content of that speaker's previous utterance to disambiguate the non-clausal utterance. This will typically mean assigning the speech act of that previous utterance to the current, non-clausal utterance. This is the case in examples (6)--(8) and (12).
   b. In a true discourse situation, where both speakers are active participants, use the speech act and content of the immediately previous utterance to disambiguate the current, non-clausal utterance. At the current stage of our knowledge, this may be merely a heuristic procedure. For example, if the preceding utterance was a question (speech act **QUERY**), the current utterance is very likely an answer to that question—i.e. an assertion (speech act **ASSERT**). This is the case in example (14).

(30) is clearly incomplete; moreover it implies a disjointness between a and b. However, these cases can clearly interleave: one speaker in a discourse can ask the other a question, eliciting a non-clausal reply (b), and then ask a follow up, non-clausal query (a). (30) does, at least, suggest some of the complexity that must go into the

assignment of speech acts to non-clausal utterances. But even this is clearly just a mechanical procedure for producing an expression in some logical language. Once this is established, there needs to be a specification of the semantics of that expression. Given expressions such as **(ASSERT JOHN)** or **QUERY JOHN)**, there must be a mechanism to actually evaluate such expressions.

In fact, there seem to be (at least) two uses of non-clausal utterances, one analogous to the anaphoric use of pronouns, the other analogous to the deictic use. The examples considered so far, such as (6)--(8), (12), (14), are analogous to the anaphoric use of pronouns. Pre-theoretically, these are cases in which there is a context-setting utterance, followed by a non-clausal utterance—by the same speaker or by a different speaker—which is, in some sense, "fit into" the context-setting utterance. But one can also, in the right pragmatic context, simply utter non-clausal without any such context-setting utterance. For example, if I see someone who owes me money, I can say "John!" with an imperative-type intonation; this, presumably, has some speech act associated with it, but it cannot be disambiguated by any preceding linguistic context. Such uses of non-clausal utterances are analogous to the deictic uses of pronouns. Thus, in order to specify the interpretation of a non-clausal utterance, the interactions of all of those factors, the pseudo-anaphoric and pseudo-deictic use, and the use of preceding linguistic, versus preceding pragmatic, context, must be worked out.[16]

An issue related to the interpretation of non-clausal utterances is how the appropriateness of a non-clausal follow-up to a clausal utterance is determined. Tim Stowell points out examples like the following:

(31) a. Whose mother did you meet? (32) a. Where do you live?
    b. *John   b. *To school
    c. John's   c. Close to school

as potential evidence for the derivation of non-clausal utterances by ellipsis. Such examples seem to indicate that the appropriateness of a non-clausal utterance can only be determined by treating it as *syntactically* part of a larger, clausal utterance. Since the evidence against the derivation of non-clausal utterances presented in Section 3 seems fairly strong, it would be desirable to find a way to explain such examples without recourse to an ellipsis analysis. An obvious, but currently merely programmatic, approach would be to treat the ill-formedness of the (b) cases in examples (31) and (32) as semantic. To make this proposal more concrete, I will sketch out a proposal assuming a semantic system like that in the BBN SLS. Under this assumption, each syntactic category has an associated semantic type. The semantic type system is structured, with certain types being subtypes of (or subsumed by) others. Functional expressions also have semantic types, which enter into type subsumption, as well. All operators that take variables, such as **lambda** and **set**, which we have already seen, take a sort field that constrains what the variable can range over. This suggests the following constraint on well-formedness, at least in the case of content (WH) questions:

(33) A non-clausal reply to a content question must either
    i. be of a semantic type that is subsumed by the semantic type of the content question's sort field
    ii. be a predicate of the same semantic type as the predicate of the content question, which fixes a value for the variable which the question ranges over

Informally, a question is an open proposition, with a semantic type (the sort field) restricting the objects that can be substituted for the open argument. An answer to such a question must fill in this open position either by specifying an object of the appropriate semantic type or by specifying a predicate of the same type as the predicate in the question, but with the open position filled in. Let us consider some actual examples of well and ill-formed replies to questions to see how this proposal would work.

(34) a. Where do you live?
    b. In Cambridge.
    c. *To Cambridge.
    d. Cambridge.

"where", in the semantic system sketched out here, would be a locative predicate whose location argument is open. (34b) is well-formed as a reply to (34a), by clause (ii.) of (33), since "in Cambridge" is also a locative predicate, which fixes the location as "Cambridge". (34c) is ill-formed, since "to Cambridge" is not a locative predicate. (34d) is well-formed by clause (i.) of (33), since "Cambridge" is itself a location. Note that "Cambridge" is not easily derived by ellipsis from a clausal utterance, since "*I live Cambridge" is bad. The only possible source is "I live in Cambridge", which would require a non-constituent ellipsis rule. There is a potential counter-argument to this objection, namely, that "live in" *does* form a constituent, as is evidenced by its ability to form a pseudo-passive. This implies that verbs that do not form pseudo-passives, such as "die", do not allow NP replies, such as (35d), which is false.

(35) a. Where did Socrates die?
    b. In Athens.
    c. *To Athens.
    d. Athens.

The approach sketched out in (33) also extends to other cases of ill-formed replies, as in (36).

(36) a. Where do you live?
    b. *Yes./*No.

In Section 3 it was argued that elements such as "yes" and "no" cannot plausibly be derived by ellipsis from clausal utterances. If that is correct, than an ellipsis account of the ill-formedness of (36) is impossible. However, (33) would predict that (36) is ill-formed, since "yes" and "no" are neither locations nor locative predicates.

On the other hand, it is not clear that (33) explains the ill-formedness of (31b) as a reply to (31a), so it can only be, at best, one part of a larger theory of acceptable replies. However, it does not seem that data from replies can be used to argue for an ellipsis theory of non-constituent utterances.

5. Utterance As An Interface

In the previous section, I argued for the existence of the category UTTERANCE as the designated start symbol of a grammar, on the basis of its role as the linguistic prime that is involved in speech act assignment. In this section, I will sketch out further functions that seem to be necessary in any language processing system, whether considered from a theoretical or practical viewpoint, that UTTERANCE is a likely candidate to perform, providing additional evidence for its existence.

In very interesting work, Polanyi (1986) and Scha and Polanyi (1988) have developed a theory they call the *Linguistic Discourse Model*—a formal theory of discourse. As part of this model, they have worked out a theory of discourse grammar that contains recursive structures built out of elements they call *discourse constituent units* (DCUs). Ultimately, the lowest level DCUs are associated with structures produced by sentential syntax; that is, the sentential processing mechanism produces structures that are passed along to the discourse component, which builds up still larger structures as part of discourse representation. Postulating the category UTTERANCE makes the interface between sentence grammar and discourse grammar cleaner.

As Section 3 has shown, there are non-clausal utterances that are not derived from S; without the existence of the category **UTTERANCE**, it would be necessary to allow lowest level DCUs to associate with any syntactic category that can constitute a complete utterance. This would, in effect, recapitulate facts of sentence grammar in discourse grammar. However, if we posit the category **UTTERANCE** as the designated start symbol of sentence grammar, then lowest level DCUs would only need to associate with **UTTERANCE**s and any statements about the constituents that **UTTERANCE** can expand to would remain internal to sentence grammar.[17] This provides a much neater division between sentence grammar and discourse grammar; moreover, it is consistent with the claim that **UTTERANCE** is the constituent to which speech acts are assigned. The picture that is being built up is one of **UTTERANCE** as an interface between different components of the language processing system: between sentence grammar and discourse grammar, and between the ordinary X-Bar categories (which carry propositional content) and discourse constituents (which are concerned with illocutionary force and other, more "expressive" aspects of language).

Another necessary function of a language processing system is what might be called "arbitration". One example of this functionality is exemplified by sentence (37a), which has the two syntactic readings (37b) and (37c).

(37) a. The boy put the ball in the box on the table
     b. The boy put $[_{NP}$ the ball in the box] $[_{PP}$ on the table]
     c. The boy put $_{NP}$ [the ball] $[_{PP}$ in the box on the table]

Any model of language processing will need to provide some mechanism for deciding between these two readings. While it is the duty of sentential syntax to provide both of these readings, it is almost certainly not the duty of syntax to decide which one is more appropriate. **UTTERANCE**, which I have already claimed serves as an interface between sentence grammar and discourse grammar, might also be a reasonable linguistic prime to fulfill this arbitration function. As an interface between sentence grammar and extra-sentential components, it would have access both to information internal to sentence grammar and to external non-syntactic (e.g. pragmatic and discourse) information. Since both types of information are necessary for resolving issues such as prepositional phrase attachment, **UTTERANCE** is perfectly located to fulfill this function.

Another aspect of arbitration is the treatment of semi-grammatical utterances:

(38) a. A curious problem showing unusual conditions appear in this example
     b. $[_{NP}$ A curious problem showing unusual conditions] $[_{VP}$ appear in this example]

The utterance in (38a) consists of an NP followed by a VP which does not agree with it in number so that the only syntactic representation that sentential syntax can produce is the "forest" in (38b), in which the NP and VP are not combined into an S. Since such utterances are comprehensible, albeit at a reduced level of grammaticality, a model of the language processing ability must provide some mechanism for handling such utterances. Again, it does not seem that sentence grammar is the appropriate place to handle such phenomena, although information from sentential syntax is required to diagnose why certain sequences of constituents have not been composed into a single larger constituent. **UTTERANCE**, which has access to sentential syntax, and, potentially, to various other components, again seems to be a reasonable place to localize the treatment of semi-grammatical utterances.

6. Conclusion

To summarize: Section 3 presented arguments that there are non-sentential utterances—utterances that are represented by S at no level of syntactic representation;

Section 4 presented semantic arguments that there exists a unique, non-recursive linguistic prime, **UTTERANCE**, which is responsible for speech act assignment; finally, Section 5 presented further arguments for the existence of **UTTERANCE** based on the interaction of sentence grammar with discourse grammar and with other components of the human linguistic processing system. Clearly, these last arguments, while quite appealing in the picture they paint of **UTTERANCE**, are the weakest and most programmatic part of this discussion. In future work, I hope to explore the use of **UTTERANCE** as an interface between sentence grammar and discourse grammar, and as a locus of control for non-syntactic processing components, which nevertheless need access to syntactic information.

There is another aspect to the arguments in Section 5 that suggests a revision of the theory I have been sketching here, with **UTTERANCE** as designated start symbol. While the arguments in Section 5, if correct, provide support for the existence of the linguistic prime that I have been calling **UTTERANCE**, they can also be taken to argue against **UTTERANCE** being part of the X-Bar system at all. Consider the picture of **UTTERANCE** that emerges from the arguments in Sections 4 and 5. While **UTTERANCE** is supposed to be an X-Bar category, it is exocentric, and does not project from any category. This has always been a problem with the category S, ever since the X-Bar system was introduced, and there have been various efforts over the years to reduce S to a projection of some independently motivated category, such as V or COMP. However, such a reduction is impossible *in principle* in the case of **UTTERANCE**, since the chief argument for its existence is its non-recursive character, which bars it from being the projection of any major category. Also, the functions that have been attributed to **UTTERANCE**—linguistic prime to which speech acts are assigned, interface between sentence grammar and discourse grammar, locus of processing control—are functions that are not characteristic of ordinary X-Bar categories.

Thus, we have a clustering of properties, but properties that are not characteristic of any prime in the X-Bar system, or, for that matter, of any other currently accepted linguistic level. This suggests, then, that **UTTERANCE** does indeed exist, but that it is, in fact, a separate level of representation or perhaps a prime in a separate level of representation, which maps between sentence grammar and other components of the language processing faculty. If this revised treatment of **UTTERANCE** is true, then we have the following picture of the relation between sentential syntax and other language processing components.

With regard to the X-Bar system, the top level of grammar is any X^{MAX} category (as is argued for independently by Barton (1989)) and perhaps some idiosyncratically specified minor categories and formatives. **UTTERANCE** forms a separate syntactic level (or, perhaps, is a prime on a separate linguistic level) that serves as an interface between sentence grammar and discourse grammar and, possibly, other extra-sentential processing modules. Viewed from the standpoint of parsing, **UTTERANCE** takes the output of the syntactic component and processes it for use by other components; viewed from the standpoint of generation, **UTTERANCE** takes information from extra-sentential components and processes it for use as input to the syntactic component.

This revised view of the nature of **UTTERANCE** presents us with a further research task: there seems to be good evidence for the existence of a linguistic prime like **UTTERANCE**, but its exact nature is uncertain. We must now see whether the initial view of it as a designated start symbol, or the final suggestion that it actually represents a separate linguistic level, is correct.

Acknowledgements

Notes

[1] I use the symbol "S" for sentence since it is the most traditional symbol and also to side-step the issue of whether sentences are projections of V or COMP or actually exocentric, since that question is irrelevant to the issue at hand.

[2] See, for example, Aho, et al (1986, p. 166): "In a grammar, one nonterminal is distinguished as the start symbol, and the set of strings it denotes is the language defined by the grammar."

[3] The *represents* relation is essentially the inverse of the *is-a* relation; for example, "ship" is-a N (noun) and N represents "ship". Rephrased, this clause says that every grammatical string is-a S.

[4] Chomsky's $\bar{\bar{S}}$ basically corresponds to Banfield's E node; see Section 4 for more details.

[5] The examples here come from the DARPA 1000-word Resource Management Database corpus, a collection of 791 sentences from a ships' readiness domain. In this context, "platform" means any sort of floating object from a boat on up to a battleship.

[6] Throughout this paper, I mean "ellipsis" to be interpreted as neutral with regard to the question of whether deletion or interpretation is responsible, since this question is tangential to the issue under discussion here.

[7] For additional syntactic arguments for this position, see also Banfield (1973), Shopen (1973), and Barton (1989).

[8] Shopen (1973, p. 65) also distinguishes these two cases in very similar terms: "We can distinguish two kinds [of ellipsis:] 'Ann's coat.' can be taken as an example of *functional ellipsis*, where a constituent plays the role of an argument without a predicate to govern it; 'Bobby refused.' is an example of *constituent ellipsis*, where a predicate is expressed without all its arguments."

[9] But see the discussion in Section 6.

[10] These representations are in the logical language of the BBN SLS; see Ayuso, et al. (1988), especially chapter 2, for more details.

[11] Note that the exact form of this representation is not at issue here. The main point is that the logical translations of (18a), (19a), and (20a) should all have a common sub-expression, representing the same propositional content.

[12] Shopen (1973, pp 70--71) explicitly denies that non-clausal utterances can have illocutionary force. However, he limits his discussion to written utterances, and does not consider the evidence from intonation.

[13] There is one difference; the initial symbol of the actual grammar is called START, rather than UTTERANCE. For the sake of clarity, I use UTTERANCE here.

[14] Note that imperatives are treated as VPs, rather than as Ss, in this grammar. However, the procedure would be the same for the corresponding S rule, in a grammar that treats imperatives as Ss.

[15] This is meant to be a representative, rather than exhaustive, list.

[16] There is a project to extend the BBN SLS to handle discourse issues such as this. We hope that this work will at least further clarify the issues involved here, even if it does not produce any hard and fast solutions.

[17] Banfield's (1973) E (Expression) node is very similar to UTTERANCE in this respect; she sees discourse as composed of sequences of Es rather than of other, recursive constituents.

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TOUGH MOVEMENT AND RELATED ISSUES IN THE SENTENCES OF CHILDREN[1]

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INTRODUCTION

Work in child language and in Syntactic theory has now begun to reflect the complementary relationship between work in these two areas that the generative research program, laid out some thirty years ago, saw as a crucial goal. We are looking at observations made about what children do--what they say and how they interpret what is said--from varied perspectives and with novel questions. But, importantly, the underlying issues aren't new. They themselves revolve around a cluster of notions central to linguistics throughout its traceable history. Simply put, the cluster of notions coalesce into the basic opposition same / different. How is identity defined, and how are its corollaries of contrast and variation determined. In the context of child language, this opposition outlines questions such as the following:

1. How different can (or must) a child's linguistic system be from a possible adult system?
    a. What licenses or mandates the differences?
    b. What resolves the differences?
2. How does the resolution proceed? (In other words, what is the characterization of development?)
    a. How can we reconcile a model of instantaneous acquisition with the reality of intermediate stages in child language?
    b. How does the assumption of a modular system of knowledge affect the way we perceive and understand the course of language development?

Current research in grammatical theory has as a central goal the determination of how different any one language can be from any other language, given the biophysical uniformity across human beings that is characteristic of the brain--what we typically take to be the repository for linguistic knowledge. This goal automatically becomes a question about the development of language in children: how is it possible for a child, with his or her neurophysiological makeup, to develop any one of the human languages or dialects that exist? A major part of the answer to this question will come from the specification of Universal Grammar, which a number of researchers take to be the characterization of the biological endowment providing for the internalization of linguistic knowledge, the initial state.

But even as we ask such questions we are struck with what seems the logically fundamental problem. We observe that children's language differs from adult language in quite apparent ways. If children are genetically endowed with the capacity to develop the language of their community, and do not learn it in the

traditional sense of learning, why do we observe these differences? Why should, or how can, what we can see of child language be different from what we see of adult language? If our preliminary goal is the understanding of the mechanisms underlying what we can see of children's language, the questions in (1) proceed; how different may our analytical (ultimately explanatory) models of these mechanisms be from those proposed to account for adult systems that presumably define the endpoint of language development? We ask further what the source of the apparent difference must be: what not only permits it, but makes the difference inevitable. Thirdly, we ask how the difference is resolved. As we know from experience, unlike the differences between dialects and languages, the differences between child language and adult language typically resolve.

Our views of the process of language acquisition generate their own questions, those we saw in (2). How does the picture of an instantaneous model of language acquisition correspond to the presumption of intermediate systems in the course of language development? How does the development of linguistic knowledge interact with the development of knowledge in other domains; how do these domains affect one another? And finally, how does our view of a model of linguistic structure as modular affect the way we perceive (and ultimately, understand) the course of language development?

OBSERVATIONS AND ANALYSIS

The discussion in this paper will address these questions in the context of children's apparently different interpretations of *tough movement* structures, such as complements to *easy* .[2] in Carol Chomsky's 1969 study, in a study carried out by Richard Cromer in 1970, and in a study by Gisela Morsbach and Pamela Steel, appearing in the *Journal of Child Language* in 1976. The discussion assumes the theoretical framework outlined in Noam Chomsky (1981) and (1986), exercising a number of the descriptive and explanatory mechanisms it provides for.

I.

In her monograph, *The Acquisition of Syntax in Children from 5 to 10*, detailing work completed just about twenty years ago, Carol Chomsky did address issues relating to difference, but from a distinct point of view. Focusing on notions of complexity, she sought to distinguish constructions, one from the other, on the basis of the extent to which their varying levels of complexity would be reflected in their appearance in children's language.

One of the sets of different constructions Chomsky tested appear as (3 here.
3. a. John is eager to please.
   b. John is easy to please.
She argued that (3b) of the then well-known, now classical, pair of sentences represents a higher level of complexity. She attributed this characterization to the claim that the grammatical relations in (3b) are not represented directly in any way, given that its structure is identical to the structure of its counterpart in (3a) with quite different (but what were claimed to be the canonical) grammatical relations. The schemata in (4) sketch the relevant issues here, which involve the interpretation of the empty categories, marked as *e*. The subscripts indicate indexing, which we assume is part of the specification of any NP.
4.   a. [John$_i$ is eager [e$_i$ to please e$_k$]]

b. [John$_i$ is easy [e$_k$ to please e$_i$]]

In the context of these assumptions and claims, Chomsky predicted that children would first interpret sentences such as (3b) as if they were structured like (4a), rather than (4b). Using the sentences in (5a), and a blindfolded *Chatty-Cathy* doll, she carried out one of the earlier psycholinguistic experiments designed, as Roeper has recently characterized the role of experimentation, "to measure the deductive capacity of linguistic theory." (Roeper 1988).

5.   a. The doll is easy to see.

b. Is the doll easy or hard to see?

Indeed, Chomsky found that boys as old as eight years and five months, and girls as old as six years, six months seemed to interpret sentences in (5) as though the missing subject of *see* were the NP **the doll**, answering the question in (5b) with"hard to see."   Questioned further, with "Would you make her easy to see," these children proceeded to remove the blindfold, and sit the doll up, presumably so that it (or she) could see .

II.

On the heels of Chomsky's work, Richard Cromer tested forty-one children between the ages of five and seven in a related experimental situation. He first categorized the children in terms of their performance on the Peabody Picture Vocabulary test (PPVT), using what that test refers to as "mental age," computed on the basis of a child's relative success with this vocabulary test.   Then, using a pair of hand puppets--a duck and a wolf--he tested children's understanding of complements to three categories of adjectives, exemplified by the sentences in (6).

6.   a. The duck/wolf is anxious to bite.

b. The duck/wolf is fun to bite.

c. The duck/wolf is nice to bite.

(6a) and (6b) of course, reflect the distinction in (4a) and (4b) respectively. (6c) is an ambiguous sentence; it could have an interpretation consistent with either (4a) or (4b).   There are a number of important differences in these two experimental procedures. To begin with, Cromer used adjectives other than *easy.* Second, and quite significant, he used the verb *bite*, whose subject is a clear agent. This is a situation unlike the one with the verb *see* , whose subject is an experiencer, not clearly an agent.   Cromer introduced a slightly different methodology, as well.   Providing children in the study with the pair of puppets (a duck and a wolf), the investigator asked these children to show (act out) a sentence just uttered.   Beginning with prompts such as "Show me 'the duck bites the wolf," the experiment moved through sentences such as those in (6). Cromer also introduced two nonsense adjectives, **risp** and **larsp**. Presenting them as (7) indicates, an experimenter would then proceed to ask a child to depict an interpretation of the sentences

"The wolf is { risp } to bite."
            { larsp }

7. a. See? Someone gave this dog a bone. So he's feeling very **risp**. He's feeling very **risp**.

b.This cat climbed up and picked a rose. And he found that chewing the rose

was **larsp**. Chewing the rose was **larsp**.

Consistent with Chomsky's observations, Cromer's results reflected that children in the experiment whose "mental ages" on the PPVT were less than six years had the subject of the predicate adjective in what we are analyzing as the matrix clause carry out the action in the subjectless (embedded) infinitive in all cases.

Some interesting variation that Cromer reported merits our attention here, as it will figure in our subsequent discussion. Rather than falling into precisely two groups, a consistent subject analysis group (a group Cromer referred to as "primitive rule users") and a group whose responses consistently reflect adult judgments(the "passers") the children in Cromer's experiment also formed a third group, which he named "the intermediates." Children in this third group "gave mixed answers--sometimes [using] the named animal and sometimes [using] the other--some of these being wrong" (Cromer 1970, p. 401). In addition, nineteen children were retested a day later, and of these, twelve gave answers that were different from the ones they had given the previous day. Two children in this "inconsistent" group, (mental ages 4:ll and 5:ll, respectively), had on the previous day given adult type answers. One on this retest changed to a mixed set of answers (some adult type, some subject only analysis), and the other "reverted to the primitive rule." (Cromer,op.cit.p.404)

The findings in the nonsense word experiments are also interesting. Children falling into the first group--the subject analysis group--invariably used the subject of the matrix predicate adjective as the actor for the infinitive. The intermediate group, "while predominantly [using the matrix subject], also includes some cases in which children assigned deep subject status to 'the other' in one or both instances, *but incorrectly* . "Passers," on the other hand, assigned deep subject status to the surface subject in one case and to the 'other' in the second case, and did so *correctly*" (ibid., p. 403, italics mine, SMK).

III.

Morsbach and Steel (1976) modified Chomsky's experimental paradigm in a slightly different way. Concluding from the criticism of other studies treating the 1969 work that the blindfolded Chatty-Cathy led some children into their responses. In their study, Morsbach and Steel varied the situation by placing a semi-transparent screen between the children they were testing and the doll that the children were questioned about. They tested children from 5,0-5,11 and 6,00-6,11 in two different groups each. For each age group, one experimental procedure (group 1) involved asking about the blindfolded doll then asking about the doll when it was not blindfolded, but hidden behind the screen. The second procedure (group 2) involved reversing this order of presentation. A third procedure involved preschool children (ages 4,0-4,11) who were only exposed to the screen method; this subtest was referred to in the study as group 3. The statistical analysis that Morsbach and Steel used to analyze their results justified their claim that in general children did significantly better in the context of the screen method. They also observed that children would change their responses in the context of the two different methods. The children in group 1 who had responded "incorrectly" to the blindfold method "passed" with the screen method. Children in group 2 who had answered "correctly" with the screen method, proceeded to "fail" with the blindfold method. The four year old children's

responses are reported as follows: "Eight of the 15 four-year-olds interpreted the structure correctly ; the others were either wrong or confused." (p. 446)

IV.

Results from these later two studies, together with Chomsky's original investigation, provide us with the questions we need to ask about difference. What precisely is the nature of the knowledge (the grammatical system) Cromer's (and Chomsky's) primitive rule users have internalized? Why does varying the experimental paradigm as Morsbach and Steel did seem to affect children's responses and what precisely is the nature of these? What causes the inconsistent groups to be so? What is the relationship of the inconsistent and intermediate groups to an instantaneous model of acquisition? Corollary to this question is the question of how children come to be "passers" What is the nature of the complexity that Chomsky imputes to structures of the *John is easy to please* type? What insights about the children's underlying systems can the results of the nonsense word subtest in Cromer's work help us develop?

It is not surprising to find that the questions themselves intersect; proposals for answers to one affect subsequent answers and even change the questions. To begin with, it is quite likely that even the "primitive rule users" are not incapable of assigning an adult structural description (whatever that turns out to be) to the so-called *tough-movement* type constructions. The claim is that underlying these children's "incorrect" responses in both Cromer's, Chomsky's,and Morsbach and Steel's respective experiments is not an overriding rule of subject control. Rather, the responses reflect an intersection of a set of systems. One system underlies a causative interpretation of strings such as *the doll is easy to see* or *the duck is nice to bite*, effected by the interaction of the children's available grammatical system and the conditions of the experiment. The second is the learning of vocabulary --more precisely, children's learning of the capacity of the predicate adjectives to assign semantic (theta) roles to their subjects. Thirdly, we have the issue of the children's knowledge of structures of the *tough-movement* type themselves.

We begin with the causative issue. It is quite plausible that many of the children's "incorrect" responses for sentences such as (5b) and (6b) in the two experiments are the consequence of their construction of causatives for *see* and *bite* , with themselves as the agents of the causative transitives. In other words, the structures underlying the children's interpretations of the sentences in (8a) and (8b) respectively are (9a) and (9b).

8. a. The doll is easy to see.
   b. The duck/wolf is fun to bite.

9. a. the doll$_i$ is easy [PRO $_{arb}$ to cause [PRO$_i$ to see]]
   b. the duck$_i$ is fun [PRO $_{arb}$ to cause [PRO$_i$ to bite np]]

A number of studies (Bowerman 1982a, b, c, 1983, 1987; Lord 1979, Borer and Wexler 1987) have noted the productivity of the causative construction in children's language. Examples such as those in (10)-(12) are abundant in the literature. (The examples in (10) and (11) are from Bowerman, those in (12) are from Lord)

10. a. I don't want any more grapes; they just **cough** me (2:8 cited in Bowerman from Braine 1971)
    b. Don't **giggle** me. (3:0)
    c. I want to **comfortable** you (5:9)

11. a. He tippitoed to the graveyard and **unburied** her. (5:1)
    b. How do you **unsqueeze** it? (3:11)
    c. Mother: (grabbing child in a game) I have to capture you.
       Child: **Uncapture** me! (3:10)

12. a. We have two kinds of corn: popcorn, and corn. Popcorn, it crunches. And corn doesn't crunch; it **eats** (3:3)

    b. You can **drink** me the milk. (3:8)
    c. I am trying to **guess** Aunt Ruth what I have (4:8)

In (10), intransitive verbs and adjectives are shown to participate in causative transitive constructions.   In (11) we see what have been referred to as novel un-verbs.   I have argued elsewhere (Klein 1984) that children interpret predicates with **unXed** as passive participles, and from these, deduce the corresponding active verbs that appear as the novel forms. What motivates them to move in this deductive direction is consistent with Lebeaux's claim that children are sensitive to a principle along the lines of (13a), which triggers the assumption of a trace in the VP of intransitive (as well as passive) constructions in which the subject can be interpreted as an affected NP. Such a structure appears as (13b).

13. a. affected [NPs] are internal arguments of verbs.
    b.   NP$_i$ [$_{VP}$ V t$_i$]
       [+affected]

In a nontrivial way, such a principle corresponds to a corollary, interacting with the syntax: if a subject is underived (if there is, for example, no possibility of reconstructing a structure including a trace), the subject will be interpreted as agentive. Together these two account not only for the child's reconstruction of a trace in the VP of a passive or of an intransitive construction without the passive morphology (inviting the analysis of these latter intransitive constructions as ergative), but also for the longstanding observation that in two-argument constructions (sentences with subject and object present) children favor interpreting the subjects as agentive.

The examples in (12) underscore the pervasiveness of such a system. Children seem to allow the internal argument of a transitive verb like **eat** to appear in subject position, and to be able to add an external agentive argument to already transitive verbs such as **drink** and **guess**.

Faced with the experimental situations we have described, young children's interpretation of sentences such as *the doll is easy to see* or *the wolf is fun to bite* is very likely to parallel structures like those underlying utterances (12b) and (12c).   Wearing two hand puppets that he or she has been instructed to

manipulate, the child in Cromer's study is invited to interpret him or herself as an agent of which the utterance given (*the wolf/duck is fun to bite*) is to be predicated.[3]   It is equally inviting for young children in Chomsky's study to respond with this interpretation. In order to answer "correctly" there, a child not only must have a grammar that does not so readily permit the causative reading , but s/he must also be able to deal with conversational openings in testing situations. The question, "Is this doll easy to see or hard to see?" is incongruous as a sincere question in the context of a blindfolded doll. Any readers who have seen the film by deVilliers and deVilliers, "Out of the Mouths of Babes" will have noted the responses of the older children in the illustrated replication of the Chomsky study; they smile knowingly at the examiner, answering "neither," and are then willing to discuss the "silliness" of the question. A young child who assumes that the question is a sincere one is very likely to resort to the causative interpretation.

The results in the Morsbach and Steel study underline this. Children's responses to the screen condition corresponded more consistently with what all of these experimenters categorize as the adult sort of response. When confronted with the blindfolded doll condition, the children "failed." The claim here is that such situations trigger the causative analysis, syntactically available to children precisely in this age group.

A developmental change involves the removal of the causative analysis from the syntax and into the lexicon. Such a move may be initiated by the deductive role of inflectional morphology. As children recognize that passive morphology in English provides for a VP internal trace, a strong deductive move is to require such morphology for the presence of a trace. A principle such as (13a) then, becomes unavailable in non-morphologically marked intransitives.[4] In the absence of positive evidence supporting the presence of a syntactic trace (and thus movement) children will be forced to wait for positive evidence that causatives may be formed for any given verb, or that some intransitive verb does indeed participate in ergative constructions. Syntactic causatives will be unavailable as default interpretations for these matured children in experimental situations such as the ones we've been considering.

This move from the syntax to the lexicon suggests that it should not be surprising to find Cromer's correlation between children's responses in his experimental paradigm and their relative performances on the PPVT. The more lexically sophisticated a child is, the more likely s/he is to be watchful precisely for the information that will permit the full specification of a lexical item; the deductive process is somewhat constrained. The presence of the intermediate group in Cromer's study allows us two inferences in the context of the framework we are using. First, we may infer that children do control the structure underlying these constructions, and second, we may infer that for each adjective they must learn the syntactic context in which it occurs.

We now turn to the tough movement structure itself to determine whether its structural complexity has anything to do with the responses that children gave in the experimental contexts we have examined. These have not readily acceded to analysis over the last thirty years. Even the recent past has provided for a number of accounts. (16) and (17) reflect these:

16. a. [np be $[_{AP}$ $[_A$ hard $[_{IP}$ PRO_{arb} to bite]] $[_{NP}$ **the wolf**]]]
    b. [np be $[_{AP}$ [hard] $[_{IP}$ PRO_{arb} to bite the wolf]]]

17. a. [the wolf be $[_{AP}$ hard $[_{CP}$ e $[_{IP}$ PRO_{arb} to bite O]]]
    b. [np be $[_{AP}$ hard $[_{CP}$ [PRO_{arb} to bite the wolf]]]][5]

(16a) represents the structure of a sentence such as *the wolf is hard to bite* and (16b) represents the structure of *it is hard to bite the wolf.* In (16a), the string *hard to bite* is itself analyzed as an internally complex lexical unit, an adjective. Its failure to assign case to its NP complement forces the movement of this complement to the empty **np** position. In (16b), the adjective *hard* takes a complement, out of which the binding conditions prevent, and the structural adjacency of the verb and NP object obviate, movement. In the absence of movement, independent conditions provide for the presence of the non-referential *it* in the empty **np** position. In other words, some adjectives will have dual lexical entries, including one in which a string with internal clause structure may be stored as a lexical unit.

In contrast, the account in (17) has its source in Chomsky(1977), inspired by earlier work by D. Lightfoot. Both theory internal innovations-- the introduction (and evolution) of the Specified Subject Condition, its role in the operation of the binding conditions, and the interaction of these with theta theory--and empirical considerations--the characteristics that *tough movement* structures shared with other WH-type constructions (such as parasitic gaps, for example) led to a reanalysis of tough movement in these terms. In this account, such adjectives are doubly specified as to whether or not the predicates which they head assign a theta role to the matrix subject. In (17a), a null operator, O, moves to adjoin to the empty COMP, leaving a trace and creating a structure that is in many ways like structures such as infinitival relatives, such as *this is a problem to think about.* Even this account is somewhat problematic insofar as the interpretation of such a structure is reconcilable with principle C of the Binding Conditions.[6] In (17b), where the adjective does not assign a theta role to the matrix subject of its predicate, the expletive *it* will appear, just as it does in (16b).

If we assume that the structures in (17) are the most likely, the problems they pose notwithstanding, we are confronted with a curious observation. Children much younger that those tested in any of the experiments we have looked at regularly produce strings like *toys are for to play with.*[7] Since such structures too have been analyzed as instances of operator movement (Chomsky(1977), their presence suggests the ability of children to analyze such constructions. The presence of simple WH movement and relative clauses in the language of young children, also documented in the literature, leads us as well to conclude that it is not this aspect of the *tough movement* constructions that make them complex for children.

The source of the apparent complexity for both Chomsky's subjects and the youngest groups in Cromer's study--his "primitive rule" users--is, I would claim, the capacity of the children to retreat to their syntactically sanctioned causative analysis in the experimental contexts. Because children do not move abruptly from this stage to an adult stage, but fall into an intermediate group (as Cromer

found), using both "subject and "object" analyses, and erring in their lexical assignment of the adjectives in both cases, we have no evidence for a general change in the grammar that would effect a complete adult system for all the adjectives in question at once. We do, on the other hand, have support for a picture of grammatical development that involves more than one grammatical module, and in which an unrelated system--in this case the system licensing the productive causatives--veils our view of another developing system--the apparently strongly deductive development of operator movement, including *tough movement* structures.

We also have an interesting question about the intermediate group that the results in Cromer's study of nonsense words raise. He noted that children in this group varied in their responses to the words (sometimes using the lexically present NP as the subject of the infinitive and sometimes using it as the object), even given the contexts in which the words were introduced (cf., (7) above). Children whose responses to the other parts of the experiment paralleled what would be adult responses typically used the syntactic contexts to limit their responses to the nonsense words. The lexically present matrix subject was subject in the complements to *risp*, and the matrix subject was object in the complements to *larsp*. In fact, the most that the examples in (7) can tell one is that both of these two nonce words could belong to the category of *nice*; there is no evidence that excludes this analysis for either of them. The older children, then, are, in a sense, jumping to conclusions. In more positive terms, they are presumably forced into this deductive path that will, in fact, give them the best results; they will, in the worst case, miscategorize an adjective. Such a failure is one of the easiest to remedy with the positive evidence available. A question that remains is what distinguishes the child who will not be strongly influenced by the structures in which s/he first encounters the adjectives and the child who will. Given that we know one difference is lexical maturity, we can ask what role that plays in this development.

We have seen that the complexity of tough movement constructions may be an issue for us to face, more than it is for children. In fact, the explanatory strength in the context of child language of the analysis involving operator movement may lend it additional support as the best descriptive choice. There is much evidence that children do control operator movement at a fairly early stage, and there is little evidence that it is this aspect of the structures children in the experiments we examined found troublesome. On the contrary, the source of young children's responses focused on an intricate balance between a readily triggered syntactic causative construction and a pragmatic trigger present in both the Chomsky and Cromer studies.

The Morsbach and Steel study reinforces this conclusion. Removing the inviting context for a causative interpretation wiped it out for even children who could be argued still to be within the causative age range--the five year olds, for example. Even for the youngest children in this third study, who seem most susceptible to anything that would trigger this syntactic process, replacing the blindfold condition with the screen condition inhibited the trigger.

If we return to the questions laid out we find ourselves with some answers, but yet a few questions. It is clear that we must appeal to some physiological developmental differences between children and adults that do, in fact, not only license

the differences we see between child and adult language, but mandate them. Unhappily, we have no precise characterization of these. But we do find that very minimal differences in a grammar--the selective placement into the syntax or the lexicon of a particular systematic correspondence, for example (in our case here, the causatives) can have far reaching effects. The accumulation of such findings will allow us, in the context of a fruitful research program, to insist on limiting the differences between developing and steady-state grammars. Moreover, the deductive process that determines the placement interacts itself with independent phenomena. Our example here involved the deductive role of passive morphology in the potential reassignment of causatives from the syntax to the lexicon. Finally,we recognize that even in controlled experimental situations our findings may be tainted by conditions whose consequences we are unaware of outside of any analytical context. This realization may be more important than it seems insofar as developing such an awareness allows us to see extra-grammatical issues interacting with grammatical systems in clear ways, while at the same time it allows us to tease out these issues, permitting ourselves the clearest look possible at the developing grammar.

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2. Elsewhere, I argue that children develop first a grammar with an ergative system working in the syntax, related to a principle such as (11) and its corollary and later abandon (11) as a syntactic determinant moving the ergative system to the lexicon (or to the semantics of the verbs themselves, as Napoli argues should be the case for English). This system would among other things, contribute to our understanding of the productivity of novel causatives and novel unverbs such as those in (8)-(10) above, and may provide an alternative account of such pairs as (i), analyzed in Gruber (1969) appearing in the spontaneous speech of children, adding insight to our analysis of the relation between theta roles and case assignment.

   i.   a. I show you.
         b. Me show you.

3. This account is easier for us to see with some of the adjectives than it is with others. Compare *the duck is fun to bite* and *the duck is tasty to bite*, for example. Nonetheless, given our lack of knowledge about the children's attribution of thematic structure to individual lexical items here, such as *tasty, anxious, creepy*, etc., we should not necessarily be bound by our own "adult" knowledge of these adjectives. While it is the case that our view of children's developing linguistic systems will be made clearer through the lens of an explicit theory of available linguistic systems, and should be constrained by such a theory, our views of children's underlying linguistic systems must not be exclusively filtered through our understanding of their language only as speakers of its "adult version."

4. The question of what moves a child to recognize passive morphology as the licensing agent for movement insofar as it induces the presence of a VP internal trace confronts us here. This motivation may grow with the recognition of the category into which the English language falls with respect to the interaction of bound morphology and syntax. Addressing some of the issues such a question raises is work by Jaeggli and Safir (1987) and Jaeggli and Hyams (1987). Of course Roeper (1987a,b) deal with questions related to the intersection of bound derivational morphology and syntax in this context as well.

5. The following phrasemarkers are provided to provide the terminological correspondences of the labeling used in (16) and (17). See Chomsky(1986b) for more explicit discussion of the principles motivating such a move and its consequences for a theory of phrase structure

```
            S̄                              CP
          /   \                          /    \
      COMP     S                     COMP      IP
             /   \                          /    \
           NP    INFLP                    NP     ĪP
                 /    \                          /    \
              INFL    VP                      INFL    VP
```
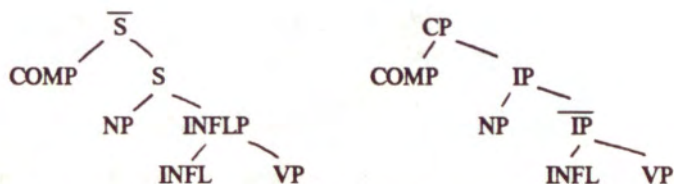
6. See Lasnik and Uriegereka (1988) for further discussion.

7. See Nishigauchi and Roeper(1985) for discussion of these purpose infinitives (which they have found in the spontaneous speech of a child between the ages of 2 and 3 1/2, as well as discussion of the presence of *for* in them, and the issue of analyzing them as instances of operator movement.

'SUBJECT' AND REFERENT TRACKING: ARGUMENTS FOR A DISCOURSE-BASED GRAMMAR OF CHINESE*

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0. Introduction Eleven years ago, The Symposium on Discourse and Syntax was held at UCLA. In the preface to the volume of papers from that symposium (Givón 1979), Talmy Givón states that '... it has become obvious to a growing number of linguists that the study of the syntax of isolated sentences, extracted, without natural context from the purposeful constructions of speakers is a methodology that has outlived its usefulness.' (p. xiii). Based on the title of the present conference and the fact from which it arose, that isolated sentences are still the central focus of most syntactic research, it seems that Givón's 'growing number' has not yet reached critical mass. It is my hope that by showing the need for a discourse-based analysis of Chinese syntax, my paper will make some small contribution in this regard.

  This paper is the second in a series arguing for a discourse-based analysis of grammatical relations in Chinese in which there is a direct mapping between semantic role and grammatical function, and there are no relation-changing lexical rules such as passivization that can change that mapping.[1] The correct assignment of semantic roles to the constituents of a discourse is done by the listener purely on the basis of the discourse structure and pragmatics (real world knowledge). Though grammatical analyses of certain constructions can be done on the sentence level, the sentence is generally not the central unit for understanding anaphora and grammatical relations in Chinese. Two related arguments are presented here: the question of 'subject' and the structure of discourse developed from an analysis of the nature of discourse referent tracking.

1.0 The Question of 'Subject' in Chinese Before I begin this section, I would first like to point out that I do not believe in any universal notion of 'subject' (cf. Van Valin 1977, 1981, Foley & Van Valin 1977, 1984), or that it is possible to discuss the notion of 'subject' outside of a particular grammatical theory. As Marantz has pointed out, 'There can be no right definition of "subject" ... only a correct (or better) syntactic theory.' (1984:3).[2] Givón 1984 defines 'subject' as a grammatical/syntactic category that codes discourse-pragmatics, specifically, the clausal topic. All languages code topics, so all languages can be said to have the pragmatic role of 'subject'. For Givón, then, 'subject' is the same as 'topic'. I will discuss this question below. For the purposes of this paper, I will assume that 'subject' is an NP that has special *grammaticalized* referential properties beyond the prominence that might be associated with its semantic role.

  Li & Thompson (1974; 1976) argue persuasively for analyzing Chinese as a topic-prominent language. They also point out that '[t]here is simply no noun phrase in Mandarin sentences which has what E. L. Keenan [1976] has termed "subject properties"' (1976:479). Aside from this, though, they give only one explicit argument, that of 'pseudo-passives' (see §1.8 below), to support the idea that there is no identifiable subject. One purpose of this paper is to support Li & Thompson's subjectless analysis of Chinese by presenting further arguments.

  Following the methodology used, for example, in Anderson 1976 and Van Valin 1981, we will examine relativization, *bi* comparatives, cross-clause co-

reference, clefting, WH-question formation, raising to 'subject', indispensability, and pseudo-passives to determine which argument of the verb, if any, figures as the syntactic pivot[3] in these various constructions that define pivots. Paul Schachter (1977) has shown that a distinction must be made between the semantic role-related properties and the reference-related properties of what we call 'subjects' in Indo-European languages. Dixon (1979) also points out that what he terms 'universal syntactic phenomena' (imperatives, jussive complements, etc.) are of no use in determining grammatical relations. I therefore will not discuss reflexivization, imperatives, or any other role-related grammatical structures. Through the study of the reference-related constructions we will see that there is no syntactic pivot in Chinese, so the concept of 'subject' as a grammatical function beyond semantic role does not exist.[4]

In discussing syntactic pivots, I will use the 'universal semantic-syntactic primitives'[5] (Dixon 1979:59) of transitive subject (A), intransitive subject (S)[6], and transitive object (O). In a given language, if S and O function in the same way in a particular syntactic construction, and differently from A, then we can say that there is a neutralization of the distinction between S and O, and so the syntactic pivot for that construction is [S,O]. If on the other hand S and A function in the same way in a particular syntactic construction, and differently from O, then we can say the syntactic pivot for that construction is [S,A]. In a language where all or most of the constructions in a language have [S,O] pivots, [S,O] can be said to be the subject of that language, and the language can be said to be syntactically ergative. If, on the other hand, [S,A] is the major pivot pattern for all or most of the syntactic constructions of the language, then that grouping can be said to be the subject, and the language can be said to be syntactically accusative. If no consistent pattern emerges, then that language has no syntactic pivot, and it makes no sense to talk of grammatical subjects, ergativity or accusativity.[7]

1.1 Cross-clause Coreference In the following three examples, the zero anaphor in the second clause is subcategorized for by the verb in both clauses:

(1)   Wǒ ná   le tā de qián, jiù _____ rēng _____ le.
       I pick-up ASP he GEN money then   throw   ASP
       I picked up his money and threw it.
(2)   Yì zhī xiǎo-jīr bú jiàn le, lǎoyīng zhuǎ zǒu le ____.
       one CLASS chick not see ASP eagle grab go ASP
       One chick disappeared, an eagle carried it away.
(3)   Nèi ge   rén ná-zhe gùnzi _____ pǎo le.
       that CLASS person holding stick   run ASP
       That person ran, holding a stick.

In examples (1)-(3), we have A=A (and O=O) coreference, S=O coreference, and A=S coreference respectively. No consistent pattern emerges, so we can say there is no syntactic pivot for cross-clause coreference.

In introducing the examples above, I specified that the zero anaphor was subcategorized for by both verbs. This is not always the case. As shown in Li & Thompson 1976 and 1979, and Tao 1986, it is the topic of the sentence/discourse, not the 'subject', that controls coreference in cross-clause deletion; the deleted element need not even be subcategorized for by the verb in the first clause. Li & Thompson (1976:469-470) give the following three examples:[8]

(4)   Nèi ke   shù yèzi   dà, suǒyǐ wǒ bù xǐhuān ____.
       that CLASS tree leaves big so   I   not   like
       That tree (topic), the leaves are big, so I don't like it (the tree).

(5)   Nèi kuài   tián dàozi zhǎngde hěn dà, suǒyǐ ____ hěn zhíqián.
       that CLASS field   rice   grow   very big, so   very valuable
       That field(topic), rice grows very big, so it (the land) is very valuable.

(6)   Nèi chǎng huǒ xiāofángduì láide zǎo, *(suǒyǐ ____ hěn lèi).
       that CLASS fire fire brigade came early,   so   very tired
       That fire (topic), the fire brigade came early, so they're very tired.

In examples (4) and (5), the zero anaphor in the second clause corefers with the topic of the first clause, and not the 'subject'. In example (6) the zero anaphor cannot corefer with *fire brigade*, as the fire brigade is not the primary topic of the clause, even though it is the 'subject' of the verb in the first clause and a logical candidate for subject of the second clause. The zero anaphor also cannot corefer with the topic because of the inanimacy of the topic. The evidence in these examples is consonant with Givón's statement that 'the main behavioral manifestation of important topics in discourse is continuity, as expressed by frequency of occurrence' and participation in equi-topic chains (1984:138), but as the topic that is participating in the cross-clause coreference is not subcategorized for, no argument can be made for subject control of cross-clause coreference, and the idea that 'subject' and 'topic' are one and the same is then questionable.

1.2 Relativization In Chinese any NP can be relativized upon:

(7)   a.   Wǒ de péngyǒu zài   nèi   ge   shítáng chī fàn.
          I GEN friend   LOC that CLASS cafeteria eat rice
          My friend eats (rice) in that cafeteria.

       b.   Wǒ zài   nèi   ge   shítáng chī fàn de péngyǒu mǎi le   shū.
          I LOC that   CLASS cafeteria eat rice REL friend   buy ASP book
          My friend who eats in that cafeteria bought some/a book(s).

       c.   Gāngcái bù shūfu   de nèi   ge   rén zǒu le.
          just-now not comfortable REL that   CLASS person go ASP
          The person who was not well just now left.

       d.   Wǒ tǎoyàn wǒ péngyǒu zài   nèi   ge   shítáng chī de   fàn.
          I   dislike I   friend   LOC that CLASS cafeteria eat REL rice
          I dislike the rice my friend eats in that cafeteria.

       e.   Wǒ bù xiǎng zài wǒ péngyǒu chī fàn de   nèi   ge   shítáng chī fàn.
          I   not want LOC I   friend eat rice REL that CLASS caf. eat rice
          I don't want to eat at the cafeteria where my friend eats.

       f.   Wǒ mǎi píngguǒ gěi tā de nèi   ge   péngyǒu lái   le.
          I   buy apples give he REL that CLASS   friend   come ASP
          The friend I bought the apples for came.

       g.   Wǒ yòng lái   xiě   zì   de   máobǐ bú jiàn le.
          I   use come write characters REL brush not see ASP
          The brush(es) I use to write characters disappeared

       h.   Xiāofángduì láide zǎo   de nèi chǎng   huǒ sǔnshī bú dà.
          fire-brigade came early REL that CLASS fire   loss   not big
          There was not much loss from the fire the fire brigade came early to.

i.   Wǒ gěi shū de nèi   ge   rén   yǐjǐng zǒu le.
        I   give book REL that CLASS person already go ASP
        The person I gave the books to already left.

From these examples we can see that it is possible not only to relativize on A (7b), S (7c), and O (7d), it is also possible to relativize on the locative NP (7e), the beneficiary (7f), the instrument[9] (7g), and even a topic (uncategorized for or not) (7h).[10]

In example (7f) there is a pronoun retained in the restrictive clause. Keenan & Comrie (1979:334) claim that in all but subject and object relativizations, a pronoun must be retained. We can see from examples (7e) and (7g) that this is not the case. A pronoun is usually retained in any indirect object construction because the verb involved is a three argument verb. When, as in (7f), the direct object position is filled only with a zero pronoun (the NP having been fronted to preverbal position), the indirect object generally is retained to avoid the confusion that would result if there were more than one postverbal zero pronoun. In cases such as (7i), where the direct object is not a zero pronoun, no indirect object pronoun need be retained.

As relativization is referential by definition, a language that has no grammatical encoding of pragmatic referentiality should be free of restrictions on relativization (Foley & Van Valin 1977). We can see that this is in fact the situation in Chinese.

1.3 WH-Question Formation   There is no movement in WH-question formation in Chinese, and any constituent can be questioned:

(8)   a. Shéi gěi wǒ mǎi yīfu?
        who give I buy clothes
        Who bought clothes for me?
    b. Wǒ děi gěi shéi mǎi yīfu?
        I must give who buy clothes
        Who must I buy clothes for?
    c. Wǒ děi gěi Zhāngsān mǎi shénme dōngxi?
        I must give   buy what   thing
        What do I have to buy for Zhangsan?
    d. Tā zài nǎli mǎi zhè ge dōngxi?
        He LOC where buy this CLASS thing
        Where did he buy this thing?

We can see that there are no limitations on what constituent of a sentence can be questioned in Chinese, so wh-question formation is another syntactic construction that has no syntactic pivot.

1.4 Clefting One of the arguments used by Tan Fu (1988 and her paper for this conference) for seeing the sentence-inital NP of a sentence such as (9a) (below) as a grammatical subject is that of clefting (using the copula *shi*, glossed SHI, following Tan's usage). She gives examples of clefting of the effector, the time phrase, and the location of the action, but claims that clefting cannot apply to objects (she cites Teng 1979 for this restriction). She gives the sentences in (9) as examples (her (12), p. 7 — all glosses, and the star on (9b'), are hers):

(9) a. Lìsì yǎ-shāng   le.
         Lisi hit-injured ASP
         Lisi was hit to injury.
     b. Mǎ   qí-lèi   le.
         horse ride-tired ASP
         The horse was ridden to
         to tiredness.
     c. Mǎ wǒ qí-lèi   le.
         horse I ride-tired ASP
         As for the horse, I rode it tired.

a'. Shì Lìsì yǎ-shāng   le.
     SHI Lisi hit-injured ASP
     It was Lisi who was hit to injury.
b'. Shì mǎ   qí-lèi   le.
     SHI horse ride-tired ASP
     It was the horse that was ridden
     tiredness.
c'. *Shì mǎ wǒ qí-lèi   le.
     SHI horse I ride-tired ASP

In LaPolla 1988, I analysed (as did Li & Thompson 1976, 1981) sentences such as (9a) not as passives, as Tan Fu would have them, but as topicalized constructions with the agent/effector unexpressed. That is, for me, the verbs in (9b) and (9c) have the same valence; they are really the same sentence, except that wǒ 'I' is not expressed in (9b). In (9a'-c') the application of clefting is not to the 'subject', but to the 'object'. The problem with the starred sentence is that it is out of context ((9a' & b' would actually be equally strange out of context). In a context where what needs to be highlighted is the fact that it is *the horse*, and not, for example, *the mule* that I 'rode to tiredness', (9c') is fine. Another example would be (10 -10'):

(10) Wǒ méi   mǎi cài.
      I did-not buy vegetables
      I didn't buy veg.

(10') Shì cài wǒ méi   mǎi.
       SHI veg. I did-not buy
       It was veg. that I didn't buy.

In this example clefting applies to the object without any problem. The one restriction there is on clefting is not on objects per se, but on non-discourse-active post-verbal objects. The restriction is not on the 'objectness' of this type of constituent, but on its non-activeness. As we see in (10'), clefting can even apply to some indefinite post-verbal objects, though for (10') to be grammatical, it would have to be accessible from the discourse situation, such as in a contrastive-focus situation where someone asked me if it was *meat* that I didn't buy. Then I could say, 'No, it was *vegetables* that I didn't buy.' The same pragmatic constraint holds in English. We can see from all this that clefting is of no use in establishing a subject for Chinese.

1.5 Comparatives Descriptions of the structure of the *bǐ* comparative in Chinese (see (11) below) often refer to 'subject'. For example, Li & Thompson (1981) state that the item being compared '... must be the subject or the topic ... of the verb phrase that expresses the dimension' (p.569). McCawley (1988) criticizes the inclusion of topics in their analysis because sentences with comparison of a fronted object, as in (12a-b), are ungrammatical. Yet there are examples where the topic can be compared. Li & Thompson give sentence (13):

(11) Wǒ   bǐ   John gāo.
      I compared-to John tall
      I am taller than John.
(12) a. *Gǒu   bǐ   māo wǒ xǐhuān.
         dog compared-to cat I like

b. *Gǒu wǒ bǐ   māo xǐhuǎn.
   dog I compared-to cat   like

(13)   Xiàng   bǐ   xióng bízi cháng.
       elephant comp-to bear nose long
       Elephants have longer noses than bears.

It seems from these examples that compared topics are acceptable when the topics are not subcategorized by the verb.

Hashimoto (1971) says that compared constituents 'need not be subject NP's ...; they may be NP's dominated by Time or Place expressions or prepositional phrases; however, they cannot be the object NP's' (p.34).

In Chinese the problem is that the constituent that expresses the dimension is a single argument *verb*, unlike English, where the constituent expressing the dimension is an *adverb*. Because of this, to compare two objects of a verb such as *xǐhuǎn* 'like', the whole clause must be repeated, with the comparative *bǐ* coming between the two clauses, as in (14).

(14)   Wǒ xǐhuǎn tā   bǐ   wǒ xǐhuǎn nǐ   duō.
       I like he compared-to I like you more
       I like him more than I like you.

As *duō* is a single argument verb, the structure of a sentence that compares objects must be the same as one that compares subjects, i.e. X PP VP, where X is the constituent being compared (a simple NP or a nominalized clause), and PP includes *bǐ* and the constituent X is being compared to. The restriction on comparatives in Chinese then is not a function of 'subject' control, but is due to the nature of the class of verbs used in comparatives: a one argument verb can take only one argument, so it is irrelevant to talk of 'subject' vs. 'non-subject'.

1.6 Raising to 'Subject' In English and many other languages, only the subject of an embedded clause can be 'raised' to the subject of a verb such as *seem* (15). In Chinese, though, the equivalent of (15c) (as well as of (15a-b)), with the 'object' raised, is perfectly acceptable. Once again, no pattern for identifying a 'subject' can be found.

(15)   a. It seems Paul bought the car.
       b. Paul seems to have bought the car.
       c. *The car seems Paul to have bought.

(16)   Chēzi hǎoxiàng Paul mǎi   le.
       car   seems   buy ASP

1.7 Indispensability Keenan (1976) gives indispensability as a one of the properties of his Subject Properties List. He says, 'A non-subject may often simply be eliminated from a sentence with the result still being a complete sentence. But this is usually not true of b[asic]-subjects' (p.313). In Chinese the verb phrase alone can be a complete sentence, as in (17). There is then no indispensible NP in the Chinese clause, and no evidence for a 'subject'.

(17)   Chī le.
       eat ASP
       I/you/he/she ate.

1.8 Pseudo-passives A common sentence type in Mandarin is where there is no agent, and the theme/patient is in initial position, as in (20):

(18)   Jiǔ   hē   le.
       wine drink ASP
       The wine was drunk; I/you/he/she drank the wine.

These are often called passives by those wishing to establish grammatical relations for Chinese (cf. Tan 1988 and her paper for this conference), and the initial NP is seen as the subject. In LaPolla 1988 I pointed out that these 'passives' only work when the 'subject' is clearly not the agent, such as when the context disambiguates it or when it is inanimate; if there is an animate 'subject' that is a possible agent, it is naturally seen as the agent, and the clause is then clearly transitive. A good example to show that this type of construction is not passive is (19), which could be said if two old friends pass in the street and one doesn't notice the other.

(19)   Eh, Lao pengyou bu renshi!?
       Hey old friend   not recognize/know
       Hey, (You) don't recognize your old friend!?

To read this as a passive sentence would be inappropriate to the situation, as the emphasis is on the person addressed not recognizing the speaker rather than it being on the speaker not being recognized by someone.

Looking at (20), we can see another problem with the 'passive' analysis, pointed out by Zhu Dexi (1986):

(20)   a.   Wǒ bù hē   jiǔ, yì dī   yě bù hē.
            I   not drink wine one drop even not drink
            I don't drink wine, not even one drop.
       b.   (Nǐ) bié   guǎn   wǒ, nǐ shéi yě bié   guǎn.
            (you) don't pay-attention I   you who also don't pay-attention
            Don't pay attention to me, don't pay attention to anyone.

If the first clause of (20a) is active, but the second clause is passive, then the parallelism is thrown off. In (20b) the topic is animate, and so the agent must be expressed in the second clause. Comparing the two examples, we can see that they are both meant to be parallel structures, and both clauses of both sentences are active.

One last argument we can make involves this type of topicalization. Givón (1984:145) states that 'one may ... view the grammar of subjectization as, in large part, the grammar of differentiating the subject from the direct object case-role.' If we look at the example below, we can see that as there are two topic positions in Chinese, sentence initial and post-agent[11], a sentence can be ambiguous when the actor and undergoer are not clearly differentiated semantically; one cannot tell what is the 'subject' and what is the 'object'/topic. This ambiguity usually disappears when the sentence occurs in a larger context. If we accept Givón's statement, then since 'subject' and 'object' are not differentiated by the grammar, no subjectization has taken place.

(21) Zhāngsān Lǐsì bú rènshi.
      Zhangsan Lisi not know
      Zhangsan, Lisi doesn't know him / Lisi, Zhangsan doesn't know.

To summarize briefly, we have looked at cross-clause coreference, relativization, wh-question formation, clefting, bi comparatives, raising to 'subject', indispensability, and pseudo-passives, and have found no discernable pattern in any of these constructions that would support the recognition of a 'subject' in Chinese.

2. Referent Tracking and the Organization of Discourse Related to the above is the question of referent tracking. Of the four types of referent tracking used in the world's languages (switch-function, switch-reference, gender/number/noun class marking, and inference — see Van Valin 1987 for details), Chinese exclusively uses inference (cf. Li & Thompson 1979 and Cheng 1988). Huang 1984 makes an important distinction between 'discourse-oriented' and 'sentence-oriented' languages, but where Huang points out that pragmatics can 'override' the grammatical rules he had worked out for the interpretation of zero anaphora, I feel that it is pragmatics that should be seen as primary, not sentence-based rules constructed, as he says, 'in contexts in which pragmatic or discoursal factors are reduced to the minimum' (Huang 1984:539). Referent tracking in Chinese does not make reference to grammatical function. Referent tracking is not, and cannot be, for example, from 'subject' to 'subject', as there is no 'subject' (see §1 above). It is only the discourse or sentence topic that is important in the determination of zero anaphora.

Chinese is a case of what Foley & Van Valin (1977) refer to as a 'role dominated' language, one where 'the organization of clause level grammar is controlled by semantic roles and their interactions' (p.298).[12] For Chinese this must be taken one step further and carried to the discourse level. Because there is no morphological marking of syntactic case role, and no indispensable referential subject, the semantic role of a constituent in Chinese can only be understood in the discourse and real world context in which it is used.[13] Neither morphology or word order supply this information,[14] as there is no verbal or nominal inflection, and preverbal constituents can be either 'subjects' or 'objects'. Let us look at the structure of discourse to see what it can tell us about anaphora.

Quite a few linguists have argued for units of discourse structure larger than sentences (see, for example, Longacre 1979, Hinds 1979, Fox 1987). James H-Y. Tai (1978) was possibly the first to argue for enlarging the scope of Chinese syntactic studies to the discourse level and to attempt to lay out a structure for Chinese discourse. Basically following the work of John Hinds, he analysed discourse into paragraphs built of coordinately or subordinately conjoined groups of sentences called 'segments'.[15] C. C. Cheng (1988) improved on this idea by showing that it is the discourse topic that is the basic element that holds the discourse together, and by giving a more hierarchical structure to discourse. What Cheng calls the 'discourse continuity' (huàfi yánxù) of a discourse topic and its 'explanation' (shuōmíng) (development in later sentences) can be diagramed in a type of top to bottom, left to right tree structure/flow chart (see (24) below). A single such topic-explanation structure often has subordinate discourse continuity structures and may also include sub-structures that are 'interruptions' (dǎchà). The following is an example of narative discourse, from Cheng (1988:2-3):

(22) Dīng lǎoshī   dài wǒmen qù jiāoyóu, zǒu guò yī shān   yòu yī shān,
     Ding teacher lead   we   go picnic   go ASP one mountain also one mount.
     Mr. Ding took us on a picnic, (we - incl. Ding) passed mount. after mount.,

     kàn dào xǔduō yěhuā.   Huā   wǒ zuì xǐhuān zǐsè de,
     see ASP many wildflowers flowers I most like   purple REL
     (and) saw many wildflowers. Flowers, I like purple ones best,

     dàochù   dōu shì, kàn de   gāoxìng jíle. Tiān kuài hēi cái huí   jiā.
     everywhere all is see PART happy very sky soon black then return home
     (they) were everywhere. Seeing (them) made (me) very happy. It was almost
     dark when (we) returned home.

We can see that the entire first clause is the discourse topic for the rest of the narrative, and contains the antecedent that controls the zero anaphor in the second, third, and last clauses. In these later clauses the agent of each action is represented by a zero anaphor, yet even if we believed that there was such a thing as a 'subject' in Chinese, we could not say that this is subject control, as the antecedent that controls these zeros is not the agent of the first clause, but is a combination of the agent and patient. After the third clause there is a second discourse topic, the fourth clause. The controlers of the zero anaphors in the fifth and sixth clauses are contained in this clause. The sentence topic in the fourth clause, *huā* 'flowers', does not control the anaphor in either of the following clauses; the zero in the fifth clause refers to *purple* flowers, not flowers in general, and the two zeros in the sixth clause refer to *wǒ* 'I' and *zǐsè de huā* "purple flowers' respectively. What determines this last fact is simply the semantics of the predications, not any structural considerations. Of the three major participants in the discourse (*wǒmen, wǒ,* and *huā*), only *wǒ* had any predication about liking flowers, and is animate, so is able to be happy. The discourse topic sentence sets up the possible antecedents, but which argument controls which zero anaphor is determined by the semantics of the predication (sometimes it is actually the entire propositional content of the clause that controls the zero anaphor in a subsequent clause). Because of these facts, a Chinese speaker will always be able to identify *wǒ* as the first zero argument in the second to last clause.

It is examples such as the above that lead Cheng to the conclusion that the 'discourse topic' (huàtí) and the 'sentence topic' (zhǔtí) are two separate entities (though of course there are situations where they coincide), a distinction not made by other linguists working on Chinese. This is similar, though, to Givón's discussion of the hierarchical structure of discourse, where he posits two functionally and syntactically distinct structures: thematic structure and topic maintanance structure.[16] We can see from all of this that the structure and semantics of the narrative as a whole, and not the structure of the individual sentences, are the main determining factors in referent tracking. This structure can be diagramed in (23) (adapted from Cheng 1988:5). Within the larger discourse continuity structure there is an identifiable sub-structure with its own discourse topic sentence and explanations. The fact that this is identifiable as a sub-structure is what allows the zero anaphor in the last clause to be recognized as coreferring with a referent in the first clause, even though it follows the second discourse topic sentence in linear order.

(23)

Disc. topic: Teacher Ding took us on a picnic

Discourse continuity

Explanation: (we - including Ding) passed mount. after mount.

Explanation: (we) saw many wildflowers

Disc. cont.

Disc. topic: Flowers, I like purple ones best

Exp.: (they) were everywhere

Exp.: Seeing (them) made (me) very happy

Explanation: It was almost dark when (we) returned home
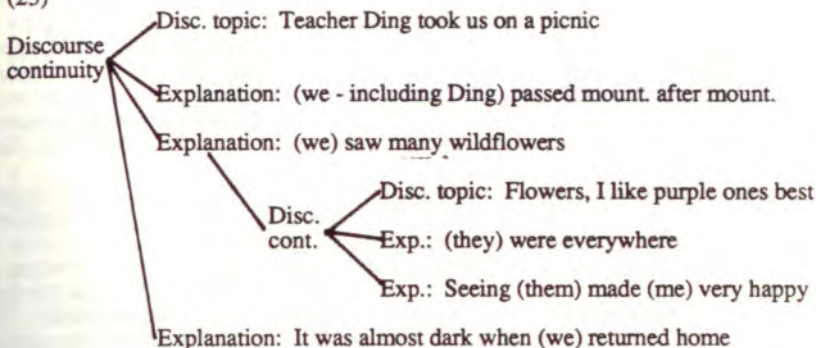
We can see that Cheng's discourse diagram is very similar to the diagram given in Hopper 1979 (p. 214) for distinguishing foreground from background information. There is in fact a strong correlation between discourse continuity substructures and the foreground-background distinction (cf. Li & Thompson 1979): the major structure is the foreground, and the substructures are background. We then can use the explications of the properties of foregrounding and backgrounding given in Hopper 1979 and Hopper & Thompson 1980 to aid us in analyzing discourse structure.

In the example given above, Cheng's discourse topic is similar to what Lambrecht (1987:375; see also Lambrecht 1986 for a fuller explanation) refers to as a 'sentence focus structure' or 'thetic sentence', which he distinguishes from topics in 'predicate-focus structures' where there is a topic and a comment about that topic. A 'sentence focus structure' is a sentence 'in which the subject is not a topic[17], and in which moreover the predicate does not express "old information", i.e. is not pragmatically presupposed'. These sentences are presentational in nature, that is, their discourse function is to present or introduce (make accessible) referents which can then be commented on using topic-comment structures ('predicate focus structures'). These sentence-focus structures are marked structures, both in terms of frequency of occurrence and in terms of morphology, and simply by the fact that they usually contain full noun phrases (cf. Fox 1987). The sentences marked as 'discourse topics' in Cheng's diagram then are sentence-focus structures, while the sentences of the 'explanations' are predicate-focus structures. This distinction is not recognized in Chen 1987, so there is a problem with examples such as (24) (his (14), p.366; (T) = topic, (C) = comment):

(24) A: (T) Wǒ (C) kànjiàn dàxiōngdī   le
          I   look-see older brother ASP
          I saw older brother
      B: (T) Tā (C) zài   nǎr?
          He   LOC where
          Where is he?
      A: (T) Tā (C) zài   cūnxītóu   de shàimàichǎng   shàng.
          He   LOC village-west GEN wheat-sunning-ground on
          He's on the wheat-sunning-ground

Chen has *wǒ* 'I' marked as a topic, yet it is actually a sentence-focus structure and not a predicate-focus structure (see fn. 16). This can be seen by the fact that if *tā* 'he' were not used in B's response, the zero anaphor would refer to the entire proposition; it would mean 'Where did you see him?'. If A's response to this also did not include *tā*, then the topic of this clause would also be the entire first clause, not *wǒ* or *dàxiōngdì*. That is, B's use of the 3rd person pronoun forces the choice of *dàxiōngdì* as the topic instead of the entire proposition 'I saw older brother'.

In Chen 1987 (and Liu 1984), the number of subject, object and indirect object zero anaphors out of a sample of 57 clauses that contained zero anaphors is given, but no definition of 'subject' etc. is given other than to say that the arguments were assigned grammatical functions based on prototype sentences. In fact there is a statement to the effect that the subject position is where the topic usually is, so usually the topic is put in subject position (Chen 1987:369). This being the definition of 'subject', it is small wonder that 75.4% of the zero anaphors in this sample are 'subjects'.

Returning to Cheng's analysis, one small problem is the question of linear order vs. hierarchical structure. As mentioned earlier, he includes interruptions within the hierarchical structure of the discourse, so that a remark made to a third participant, unrelated to the discourse between the first and second participants would be given a node on the flow chart in its discourse continuity structure. The example Cheng gives is the equivalent of the narrator of the example given above saying 'Little brother, stop making so much noise! We're talking' between the second to last and last clauses. My view is that this is actually a separate discourse, and so should not be diagramed within the structure of the main discourse That is, linear order must be kept distinct from discourse structure.

Another minor problem is that Cheng criticises Li & Thompson 1979 by say that that paper 'over and over emphasizes that deletion of pronouns in discourse has no relationship to the grammatical structure of discourse' (p.11). He corrects (rightly) a misanalysis of some of Li & Thompson's data to show that their analysis of complete reliance on pragmatics is wrong. The problem is how do we define 'grammatical structure'? What Li & Thompson actually said was that 'zero-pronouns can occur in any grammatical slot on the basis of coreferentiality with an antecedent that itself may be in any grammatical slot, at some distance, or not even present. The fundamental strategy in the interpretation of zero-pronouns in Chinese discourse, then, is inference *on the basis of pragmatic information provided by the discourse* and our knowledge of the world' (1979:320 — emphasis mine). The fact that grammatical *relations* are not of prime importance does not mean grammatical *structure* is not important. The italicized part of the quote above can refer to the different encodings given to foreground vs. background clauses, and the difference in structure between sentence-focus structures and predicate-focus structures (see above). In fact Li & Thompson's principle of conjoinability of clauses makes reference to 'the *syntactic* and semantic properties of those clauses' (1979:330 — emphasis mine).

3.0 Conclusion Given the evidence above, any analysis of Chinese syntax must therefore include, and possibly be based on, the discourse level. One final point is that it is often assumed that some historical accident or strange quirk of the Chinese language or people is responsible for the fact that there is no morphological marking of pragmatic case roles, but I would like to argue that it is precisely because there are no grammaticalized syntactic case roles that there is no morphological marking.

[1]The question of lexical passives and pseudo-passives was delt with in detail in LaPolla 1988.

[2]See also a similar argument, from the perspective of relational grammar, in Johnson 1977.

[3] This concept is from Dixon 1979, but see also Foley & Van Valin 1984:107-124 for a discussion of the nature of pivots and the distinction between Pragmatic Pivots and Semantic Pivots. For Dixon, pivots are a surface phenomenon, as there is a deep universal subject. Foley & Van Valin's Role and Reference Grammar is a mono-stratal theory, and what Dixon calls deep subject properties, F&VV analyze as role-related properties different from the reference-related properties that define pragmatic pivots.

[4]Y. R. Chao (1968) spoke of 'subjects', but loosely defined them as whatever came first in the sentence, and understood them more as topics than as what are normally called 'subjects'.

[5]See Du Bois 1985 for arguments why A, S & O are not universal or primitives. Nonetheless, I will use them here, as Du Bois does, because they are useful heuristic notions.

[6]Intransitive subjects can also be split into agentive and non-agentive subjects, but this distinction is not important for this discussion.

[7]This paragraph adapted from Van Valin 1981:362. There are also two other possible configurations: an active-inactive split, as in Acehnese (Durie 1987); and a situation such as in Takelma, where S, A and O each pattern distictively (see Fillmore 1968, from Sapir 1917).

[8]I have slightly modified the glossing of the second example.

[9]As James D.. McCawley has pointed out (p.c.): 'Since it's hard to tell which uses of *yòng* are verbs and which are instrumental prepositions, it isn't completely clear that the relativized NP in (7g) is an instrument in the syntactic sense.' This being the case, my remarks are limited to the semantic sense.

[10]This can even be extended to include genitives and objects of comparison (Maxwell 1979).

[11]That is, the fronted 'object' can occur in initial or second position in the sentence. The case I am speaking of here is when both the agent and a fronted object appear in preverbal position — ignoring here the question of the *ba*-construction, etc.

[12]The idea that it is semantic role that is primary in Chinese is not new; see for example, Wang 1956 and Gao 1956.

[13]This is not to say that there has been no grammaticalization of pragmatics in Chinese. One clear case is the specialization of word order, with the topic early in the sentence and the focus at the end of the sentence. I will deal with this question in the third paper of this series.

[14]Contrary to Yang (1980:1), which states, 'Semantic functions of linguistic units can be conveyed only through syntactic means ...'

[15]Similar to the 'paragraph topic → segment' structure given in Hinds 1979.

[16]This is my evaluation. Cheng criticises Chen 1984 (cited as Chen's 1983 UCLA M.A. thesis) for distinguishing between topic continuity and semantic continuity, a distinction that parallels Givón's, so Cheng may not agree with this evaluation. For him 'the discourse continuity is only the hierarchical structure of sentences in a discourse, and is not a semantic structure' (p. 12).

[17]The fact that the topic sentence includes a pronoun, which is usually an unmarked topic, does not necessarily mean that that pronoun is a topic. In the case here, its activation state would be what Lambrecht calls 'unused', that is, it is accessible, but not activated in the discourse. There is a clear distinction between 1st & 2nd person pronouns vs. 3rd person pronouns in this regard. These remarks are also relevant to the discussion of ex. (24).

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X-Bar Syntax and the Unity of Zero *And*-Coordinated Noun Phrases
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A zero *and*-coordinated noun phrase (or Ø-NP* to borrow Jackendoff's term NP*) is a type of NP in which two singular nouns, preceded by the zero article (Ø), are conjoined with *and*, as in (1b) below.

> (1a) The cowboy and his horse galloped off into the sunset. (1b) <u>Horse and rider</u> were later found dead by a poisoned well.

Jespersen found such noun phrases to occur in all syntactic positions and in both generic and specific contexts (examples from Jespersen 1949:404–8):

> Specific ([+specific])
> - (a) <u>Brother and sister</u> were at breakfast. (subject)
> - (b) Kitty hurriedly gathered up <u>glove and fan</u>. (object)
> - (c) ...twirling the stem of the wine glass between <u>thumb and first finger</u>. (object of preposition)
> - (d) I can't be <u>buyer and seller</u>, too. (predicate of *be*)
>
> Generic ([-specific])
> - (e) For <u>oak and elm</u> have pleasant leaves.

In describing what I will refer to as the unity of such coordinated NP's, Hewson (1972:128) claims that the elements in such an NP must "...be known as, or felt to be, a part of each other, or of a larger whole, group, team or range...If they are even remotely unrelated the article [i.e., *a* or *the*] must be used." Hewson's point is a little overstated, however, because when two unrelated nouns are brought together in earlier discourse, they too may be expressed in a Ø-NP* structure as shown in (2).

> (2) The villagers had attached a lantern to the horse's back to act as a beacon for the weary searchers. But after the storm, <u>horse and lantern</u> were nowhere to be found.

On the other hand, a second article can be added intentionally to force a separate interpretation, as in sentence (3) from Maugham (1902:138–39).

> (3) Bertha could see only the sky ... now grey, darkening the room; <u>the furniture and the wallpaper</u> forced themselves distastefully on her mind.

Using Jackendoff's (1977) version of X-bar syntax, I hope to account for the sense of "unity" that obtains in (1) and (2) [as opposed to the distinct separateness of interpretation of the NP's in (3)] while elucidating the mechanism for the determination of the article in conjoined noun phrases.

But first we look at an earlier syntactic description that derives coordinated NP

structures from conjoined independent sentences (see Crockett 1972). The process of EQUI deletion removes identical constituents while the process of regrouping assigns the correct plural agreement on the verb. According to this schema, sentence (1b) would derive from sentences (4a) and (4b).

(4a) The horse was later found dead by a poisoned well.
   and
(4b) The rider was later found dead by a poisoned well.

Deletion would remove *was later found dead by a poisoned well* from (4b) and regrouping would change *was* in (4a) to *were* What this schema fails to account for, however, is the deletion of the articles before each of the head nouns *horse* and *rider*. Dougherty (1970 and 1971) rejects this derivation and instead assigns features such as [± totality] to the coordinated node. But since Dougherty also fails to account for the assignment of the article, I would like to concentrate on Jackendoff (1977:51) who, in discussing exceptions to his Uniform Three Level Hypothesis, suggests the PS rule shown in (5) for coordinated stuctures, which "permits coordination of any syntactic category" and does not derive conjoined nouns from conjoined independent sentences. The "i" in the formula represents the fact that the syntactic category remains at the same X-bar level when it is coordinated.

(5) $X_i \rightarrow X_i - (conj - X_i)*$

In describing NP specifiers, Jackendoff places the articles among the demonstratives, which include *the, this, that, these, those, which, what,* and possibly *a* and *some,* although he makes no mention of the Ø article. Demonstratives (Art''') are classed as N''' quantifiers according to the PS rule shown in (6).

(6) $N''' \rightarrow (\left\{ \begin{array}{c} N''' \\ Art''' \end{array} \right\}) - N''$

Jackendoff's schema for the description of noun modification at his proposed three N-bar levels provides a framework for investigating the mechanism for the attachment of the article in Ø-NP* structures. With the application of the PS rule stated in (6), the article is attached at the N''' node, as shown schematically in (7) below. Modifying phrases, on the other hand, are attached according to their degree of "closeness" to the headnoun. Thus, strictly subcategorized arguments (e.g., *of*-phrases) are attached at the N' node, attributive adjectives and restrictive relative clauses to the N'' node, and nonrestrictive relative clauses to the N''' node, while the lexical head nouns remain at the N level.

(7)
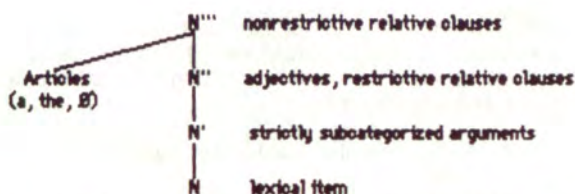
This tiered schema proves interesting when applied to conjoined nouns for it shows not only how both specifiers and modifiers might interact with each of the head nouns in an NP* structure but also how varying degrees of the unity described by Hewson, Dougherty, and Quirk et al. (1972) might be accounted for. With this in mind, let's look at some examples of coordinated NP structures at the N''', N'', N', and N levels from published works.

Sentences (8-10) are examples of N''' coordination.

(8) "...[her] attitude towards life was <u>a shrug of the shoulders and a well-bred smile of contempt</u>..." (Maugham 1902:63)

In (8), which is analogous to (3) above, the modifiers are clustered around their respective head nouns, *shrug* and *smile*. The N''' conjunction places the nouns eight nodes apart and allows the attachment of an article to each of the conjoined nodes. Thus, the second branch could have been changed to (9a) or (9b) without affecting grammaticality:

(9a) a shrug of the shoulders and <u>the</u> well-bred smile of contempt (e.g., with which we are all familiar)
(9b) a shrug of the shoulders and ($\emptyset$) well-bred smiles of contempt (e.g., which she often uses)

In some cases, N-bar syntax still requires the EQUI deletion rule, e.g., when an *of*-phrase modifies both elements of a coordination, as in the asyndetic [i.e., based on a

comma rather than *and*] coordination from (Maugham 1925: 63) shown in (10).

(10) "It needed the freshness and youth, the massive strength of her husband, to bring life to the decayed race."

The postmodifying phrase *of her husband* is deleted from the left branch. Otherwise, to apply to both N's in the coordination, it would have to be attached to N''', which fits neither Jackendoff's taxonomy nor the intuitive proximity of the nouns to the *of*-phrases.

Sentences (11-12) are examples of N'' coordination.

(11a)"He went about with hanging head and melancholy face."(Maugham 1925:188)

In (11a), the article Ø applies to the conjunction as a whole. The NP could also have been changed by simply replacing the zero article with a, as in (11b).

(11b) He went about with a hanging head and melancholy face.

In either case, the nouns are interpreted as being more unified than those in (10) and notice that the nouns are now only six nodes apart. As is always the case with the zero article [because it cannot be distinguished from the omission of a specifier], (11a) could

also have been diagrammed as the N''' coordination in (11c).

(11c)

However, if the writer had desired an unambiguous separation of the head nouns, he would, no doubt, have written *with hanging head and a melancholy face*, for example, as he did in (10). The N'' coordination in sentence (12) shows what happens when an *of*-phrase modifies only one of the nouns in a coordination.

(12) "A heavy cigarette smoker and user of the narcotic betel leaf, she died on Dec. 12, 1891..." (*World Press Review* 34,9:40)
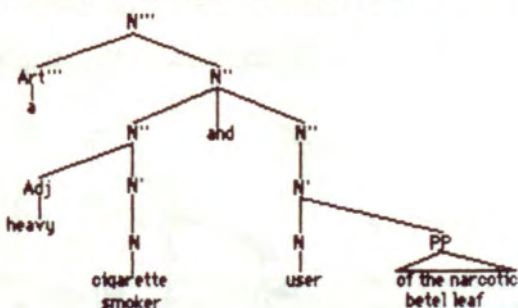
In (12), the adjective *heavy* applies exclusively to the compound noun *cigarette smoker* and the PP *of the narcotic betel leaf* to the noun *user*. These modifiers keep the coordination at the N'' level following Jackendoff's schema, which we saw in (7)..

Sentences (13-14) are examples of N' Coordination. In (13), we see that it is possible to interpret the adjective *heavy* in sentence (12) as applying to both *cigarette smoker* and *user* (i.e., heavy smoker and user). In this case, the head nouns are coordinated at the N' level, producing an even greater sense of unity. The nouns are now only four nodes apart.

(13)
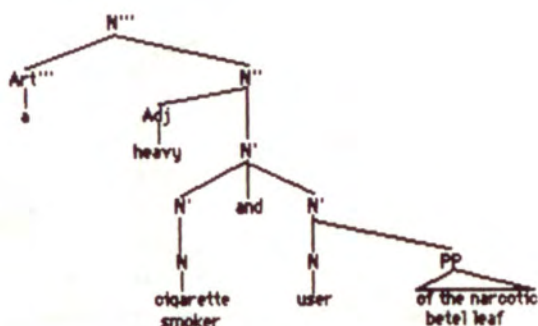
Another example of N' coordination is shown in (14).

(14) "<u>Eye of newt and tongue of dog</u>, Wool of bat and toe of frog (Shakespeare, Macbeth, Act IV, Scene 1)
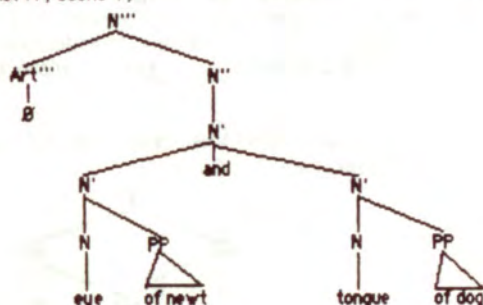
In (14), the unity of *eye* and *tongue* is apparent. Indeed, we interpret the NP* as a blending of essences, as in a simmering sauce. Had the phrase been written *eye of dog, and tongue of newt*, the sense would hardly have changed. Of course, the Ø article also contributes to the sense of massness.

Sentences (15-16) are examples of N Coordination.

(15) "If <u>the strength and direction of a certain force</u> vary from place to place..." (Science News 130,11:16

(15)

```
              N'''
             /    \
         Art'''    N''
          |         |
         the        N'
                   /   \
                  N     Pp
                 / \      \
                N  and  R   of a certain force
                |       |
            strength  direction
```
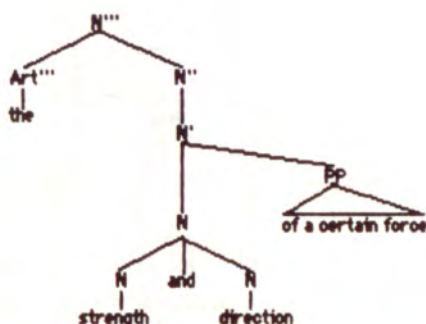
In (15), the head nouns are only two nodes apart and share a strong sense of unity. The prepositional phrase applies equally to both head nouns and could have been stated as *the strength of a certain force and direction of a certain force*, but this would then have required an N'' conjunction, as in sentence (11). In comparison with (10), sentence (15) shows that it is only the higher levels of modification (i.e., the adjective *massive*) and specification (i.e., the article *the*) that prevents (10) from having the same overall tree structure as (15). Yet it is precisely the article and the adjective that widens the distance between the coordinated nouns. Another instance of N conjunction is shown in (16a).

(16a) "Horse-chestnut trees, deep in <u>new leaf and flower</u>, made flat shade."
(Lawrence 1975:201)

```
            N'''
           /    \
        Art'''   N''
                /   \
             Adj     N'
              |       |
             new      N
                     /|\
                    N and N
                    |     |
                  leaf  flower
```
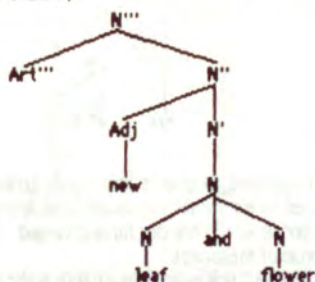
In this example, the adjective *new* applies equally to the conjoined head nouns. But there is also the possibility of restricting the application of the adjective to the first head noun, thereby separating the two head nouns to a greater degree and allowing a different interpretation. The nouns would then constitute an N'' conjunction, as in (16b).

(16b)

The foregoing examples show that Jackendoff's three N-bar levels can be productively applied to conjoined nouns and NP's, creating what could be referred to as an N'''*, an N''*, an N'*, and an N* category. This nomenclature is meant to show that the first three structures constitute conjoined NP structures at three levels whereas the fourth constitutes a conjoined noun structure.

The nouns constituting the Ø-NP* structure that we saw in (1b) at the beginning of this paper are both at the N level. *Horse and rider* would thus have the form at D-structure shown in (17a).
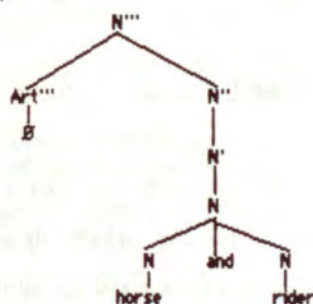
The horse and rider, on the other hand, would have the form at D-structure shown in (17b).

(17b)
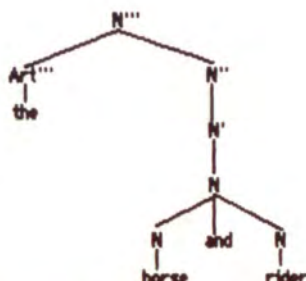
The tree diagram suggests that the Ø-NP* *horse and rider* occurs without determiners at D-structure. The choice of the Ø article is made outside of the NP* (which should in this case be labelled N*), just as it is for any lexical item, and in fact any of the three articles (*a, the,* and Ø) are possible specifiers of the NP*. What is left to explain is why the zero article can be chosen with singular countable nouns. The same structure under the same conditions occurs in several other languages (e.g., Danish, German, Portuguese and Spanish, but curiously not French), and in all cases it has a "poetic ring" as it does in English. However, a similar "poetic" effect (clearly the marked option) can be achieved by specifying a singular count noun with the zero article, as in (18 a) and (18b).

(18a) She gazed at him, head turned to one side.
(18b) Everything was fly that came into his web. (Joseph Conrad 1913:55)

The choice of the zero article with coordinated singular countable nouns, then, may be simply a marked one. The prior mention requirement for specific nouns that we saw in (1b) and (3) might serve merely to set the head nouns as candidates for N conjunction, essentially making the juxtaposition of the members of the pair acceptable because each has beeen made part of a larger whole for the hearer through prior discourse.

The use of a determiner with the second in a pair of coordinated elements is deletable in any context wherein those two elements are logically able to function as an undifferentiated unit (e.g., husband and wife, brother and sister, horse and carriage). A second determiner is required only when the elements are to be considered as being separate, as we saw in sentence (3). Such a conjunction is actually an N''''*, in which each element of the compound (i.e., *the furniture* and *the wallpaper*) is assigned its own specifier, as shown in (19).

(19)
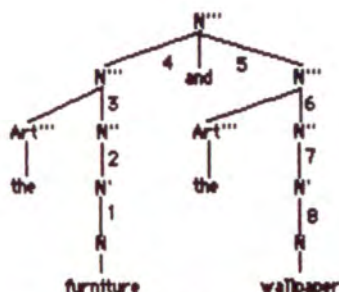
The distinct separateness of interpretation of each coordinated element can be explained by the fact that eight nodes separate the conjoined nouns. The greater the separation at D-structure, the more separate the interpretation. Moreover, each is an N''' and therefore equivalent in status to a noun postmodified with a nonrestrictive relative clause (see 7). Such nouns in conjunction are too separate to allow a single determiner to specify them, as shown in (20).

(20) The man, who worked in the fields, and $\left\{ \begin{array}{l} *\text{woman} \\ \text{the woman} \end{array} \right\}$, who managed the dairy, were not prepared for city life.

In sum, the basic difference between *the furniture and the wallpaper* and *horse and rider* is that *the furniture* and *the wallpaper* are coordinated NP's whereas *horse and rider* (or a *horse* and *rider* or the *horse* and *rider*) are simply coordinated N's. The latter appear to form a more closely-knit pair whose unity can be ascribed to the fact that the coordinated elements constitute an N and are therefore "equivalent" to a lexical item. The function of lexis is to trigger a concept which must necessarily be cogent and iconic. Conjunction at the N level works to retain this unified effect. Such a unity of concept also applies to noun compounds, which can be coined as NP's at the N'' level in the form of head nouns with relative clauses (*a store that sells books* --> *a bookstore*) but have only N status as a noun compound. It is clear that *bookstore* is a unified concept that is interpreted as a kind of store. Likewise, a complex noun compound such as *a cathode ray tube display unit* is perceived as a type of unit and not as a separate cathode and ray and tube and display and unit.

In conclusion, the N-bar schema appears to allow any article (or other specifier) to occur with NP* structures and suggests that the higher the N-bar level of a coordinated noun or NP structure, the more likely it is to be interpreted as consisting of separate entities. Conversely, the lower the N-bar level, the more likely the coordinated elements are to be interpreted as a unity.

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The Metaphorical Extensions of *see*
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1.0 Introduction

The verb *see* encompasses a broad spectrum of meanings, ranging from its basic sense, as in *I saw the cat*, and *Fred can see the ocean from his window*, to its more abstract senses, as in *see them to the door*, *she saw to it that we were fed*, and *I don't see what you mean*. Characterizing all the senses of *see* is important since they constitute its semantic structure. The goals of this paper are a) to analyze the semantic structure of *see*, including its metaphorical extensions, and b) to propose a model for mapping the *Understanding is Seeing* metaphor, invoked in cases where *see* refers to knowledge.

2.0 Previous Research

Research on *see* and other verbs of perception appears sporadically throughout the literature. Truth conditional semantic work on these verbs includes Barwise and Perry (1984), who contend that the viewer construed in an utterance involving vision *sees* what occurs in the real world. [1] Syntactic research includes Akmajian (1977), who focuses on the complement structure of verbs such as *see* and *watch*. Although some linguists have explored the semantic nature of verbs of perception (e.g., Kirsner and Thompson 1976, Rogers 1971), they have neglected to explain metaphorical extensions. Finally, in the cognitive paradigm, Sweetser (1984) discusses the diachronic development of Indo-European perceptual verbs. Conclusive research on *see* and other verbs of perception--that explains conceptual properties and considers metaphorical extensions-- is yet to be realized.

3.0 Visual Perception

Lakoff (1987) discusses commonsense knowledge relating to vision, which is pertinent to the semantic structure of verbs of perception since the way we think about vision determines the way we talk about it. Arguing against Barwise and Perry's (1984) objectivist approach to perception, he provides the *ICM of Seeing*, [2] comprised of components corresponding to representative cases of vision:

> *You see things as they are*
> *You are aware of what you see*
> *You see what's in front of you*

Although Lakoff argues compellingly against objectivist approaches to looking at vision, he neglects important aspects of visual processing, particularly the ability to perceive a whole object from seeing part of it. Addition of the following component to the *ICM of Seeing* addresses this shortcoming:

> *You see part of something, and you process it as a whole*

In addition to the amended version of the *ICM of Seeing*, other elements of visual perception must be considered since their construal constitutes the meaning of *see* (and other verbs of visual perception). [3]

3.1 Ideal Viewing Arrangement

The *ideal viewing arrangement* (the construal of a prototypical view-ing setting) is important because it comprises the conceptual (semantic) structure of *see* and because some of its elements transfer over to its abstract senses via metaphor. This arrangement is comprised of a viewer, **V**, who perceives an entity, **E** (an object or event) located in her visual field, **VF**, the viewer's scope of sight, which is an abstract con-tainer [4] into and out of which physically perceivable things or events move. Extending her line of sight into **VF**, the viewer makes visual con-tact with **E**, establishing a link between **V** and **E** such that **V** holds a superordinate position with respect to **E**. This asymmetry is motivated by the following:

- **E** is accessible to **V** (as long as **E** is in **VF**).
- **V** is conscious of **E**, but the opposite is not necessarily true.
- **V** exerts energy (volition) to view **E**, but **E** does not.

The viewing arrangement can be schematicized as follows:

VF
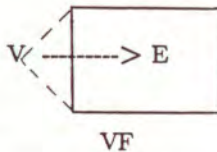
(The dotted arrow represents the viewer's line of sight, and the box represents the visual field.) With this arrangement, **E** does not typically undergo a state change by virtue of being perceived, and it can be either static or dynamic. [5] For instance, **V** can view a dog that is motionless (asleep), or in motion (running). (The distinction between static and dynamic objects has interesting grammatical ramifications for perceptual verbs, which will be analyzed in a future paper.)

4.0 The Semantic Structure of *see*

Adequately characterizing the semantic structure of *see* (or any other highly polysemous word) requires analyzing a full range of mean-ings and the relations that hold among them. This can best be realized by appealing to Langacker's (1987) *Network Model*, [6] in which the full meaning of *see* (or of any polysemous word) is a network of related senses in which all senses are given equal status. The most central (basic) sense of *see* refers to vision, and gradation from this gives rise to its nonvisual (metaphorical) senses.

4.1 Basic Meaning: Visual

The elements of the *ideal viewing arrangement* are evoked with the basic uses of *see*, e.g. *she saw Fred taking a bath*. This utterance invokes the components **V**, **E** and **VF**, and is construed such that: *she* = **V**, *Fred* and *taking a bath* = **E**, and the (implicit) bathroom = **VF**.

4.2 Extended Meanings: Non-Visual

This section describes the non-visual senses of *see*, beginning with the **irrealis** sense in (01). In this example, *see* refers to visualization rather than to visual perception, and the agent is the conceptualizer, not the viewer. This meaning of *see* is transparently related to its visual meaning.[7]

> (01)(a) She saw herself bite Raul in the dream.
> (b) When I closed my eyes I saw a unicorn.

In (02), *see* refers to **social interaction** in which the agent is not merely viewing, but interacting with someone. This extension, a metonymy (part-whole relation), is motivated since viewing typically constitutes the onset of an interaction. For example, in (02)(a), after the doctor made visual contact with the patient, he was presumably examining her. In (02)(b), the people in the relationship are continuing to date each other, which involves two individuals regularly interacting. Only part of this interaction (unless of course they are blind) would be visual.

> (02)(a) The doctor was seeing the patient then.
> (b) Kathy and Raphael are still seeing each other.

The examples in (03) indicate **nonvisual perception**. In (03)(a), *see* means smell; in (b), touch; in (c), audition; and in (d), taste. Metonymy is involved in each of these cases in that *see* represents other (nonvisual) senses.[8] This correlates to Rogers' (1971) claims about different modes of perception meaning the same thing at a highly schematic level. This is interesting because *see* is productively extended to non-visual perception, but verbs of non-visual perception such as *smell, listen*, and *feel* generally do not refer to vision. For example, it acceptable to say *I see you have a cough*, but unacceptable to say ** I hear you have a sunburn* (except for the implied inferential evidential sense (=hearsay), which I am not concerned with in this particular extension). Finally, the semantic properties of this type of extension are similar to those of visual evidentials, found in languages such as Maricopa.[9]

> (03)(a) I saw that you ate garlic again tonight.   [olfaction]
> (b) I see your skin is smoother these days.   [touch]
> (c) I see that you have improved your range.   [audition]
> (d) I see that you added salt to the soup.   [taste]

In (04), *see* refers to checking the current state of something. In these sentences, the agent does not view a patient; rather, she checks its condition. Such cases typically imply expectation.

> (04)(a) See if he wants to go.
> (b) I want to see if I can get tickets to the soccer game.

In (05), *see* refers to **experience** (usually direct). This extension is motivated in that experiencing something directly often involves seeing it. For example, in (05)(a) John experiences (first-hand) his worst day at the office. Often in such cases the subject is personified, as in (b) and (c).

> (05)(a) Fred saw his worst day at the office on Thursday.
> (b) San Diego saw little rain this year.

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    (c)   The Lakers have just seen their best season.

Some meanings of *see* refer to **control**. One type is that in (06), in which in each case an agent wants a particular goal to be realized. Specifically, the agent takes action toward ensuring that a certain act is carried out with respect to the patient. In this sense, the agent has control over the patient. For example, in (06)(a), the Pope, in control over the bishop, set out to fire him.

    (06)(a) The Pope saw that the bishop was excommunicated.
        (b) Henry always sees that his kids get enough sleep.
        (c) We saw that the bill was paid.

The meaning of *see* in (07) is close to that in (06) in that both invoke the notion of goal as well as some degree of control by the agent in relation to the patient. *Linear path* is crucial to these cases.[10] For example, in (07)(a) and (b), the agent accompanies the patient on a path toward a goal, and in doing so, "enables" or "facilitates" its motion. (07)(c) and (d) are similar except that goals do not indicate a physical location, but an abstract location, e.g. time and condition in (c), and a problem or situation in (d). In both types of utterances, motion (physical or abstract) occurs with the agent and patient, along a path and toward a goal.

    (07)(a) He saw us to the door.
        (b) She saw Eve off at the airport.
        (c) Mary has seen him through some difficult times.
        (d) Just try and see your way out of this one.

The sentences in (08) exhibit the most celebrated semantic extension of *see*: that referring to *know*. In each case, *see* does not code vision, but **understanding** or **knowledge**. For example, in (08)(a), *see* refers to speech; in (b), to a speaker's intent; (c), to an opinion; and in (d), to an argument.

    (08)(a) I see what you are saying.
        (b) I don't John saw what you meant by that.
        (c) Do you see where I'm coming from?-
        (d) I don't see your argument. Could you clarify it?

5.0 Metaphorical Structure and Semantic Extension

This section, drawing upon notions from Lakoff and Johnson 1980, Lakoff 1987, and Turner 1987, maps the *Understanding is Seeing* metaphor, evoked with cases of *see* that refer to *know*.

Simply stated, a metaphor involves understanding one thing in terms of another. It is not simply a lexical property; it functions at the conceptual level, shaping part of reasoning capacity. Synchronically and diachronically it motivates semantic extensions of polysemous words.[11] As Lakoff and Turner (1988) point out, there are many types of metaphors, and these differ along many parameters, e.g. poetic versus everyday, conventionalized versus nonconventionalized. These differences should be treated as matters of degree, rather than as clear-cut distinctions.

Metaphorical structure consists of: a *source domain* (SD), a *target domain* (TD), and the *mapping* of elements from the former, which is inherently more concrete, to the latter, which is inherently more abstract. As Lakoff (1987) claims, the SD and the TD are *mental spaces* (Fauconnier 1985). [14] (The theoretical notions associated with Fauconnier's theory are natural for mapping. Especially useful are *connectors* (slightly modified here) for mapping elements from the SD to the TD.) The elements that map from the SD to the TD are comprised of *basic image-schemata*, complex schematic structures that exist at the preconceptual level, and that have an internal logic of their own. [15] These include *source-path-goal, container, link,* and *part-whole*.

A *basic metaphor,* is a metaphor that is deeply entrenched in our conceptual experience, [12] typically conventionalized, used automatically, and mapped relatively simply. Examples include: *Life is a Journey, More is Up, Time is Space, Argument is War,* and *Anger is Heat.* [13] Another basic metaphor (focal point of this paper), both pervasive and deeply entrenched in our conceptual experience, is *Understanding is Seeing* (*US*). Simply stated, this metaphor is structured such that *knowledge* is described in terms of *vision*. As Sweetser (1984) correctly points out, this mapping is natural given the correlation between vision and cognition. Since vision, our primary means for gaining objective information, [16] is more basic than knowledge (in that it is physical), it serves as the natural SD. Accordingly, knowledge, sharing certain cognitive processes invoked with vision, yet inherently more abstract (partly since mental objects are less accessible than are visual objects), serves as a natural TD.

The mapping of *US*, invoked with the *see = know* cases, ((07)) will now be addressed, using theoretical notions from *Mental Spaces* (Fauconnier 1985), and Lakoff's (1987) basic image-schemata. Figure I is a schematic depiction of this mapping. Before explaining how this model maps *US*, some useful notation will be provided. The following schematically represents the mapping of image-schemata:

$$X \dashrightarrow X' \dashrightarrow X''$$

Image-schemata are represented as follows: X at the preconceptual level, X' in the SD, and X'' in the TD. How these symbols are realized depends on the metaphor and the image-schemata it invokes. [17] In following mapping, **a, b, c,** and **d** are used to represent image-schemata. Each one is systematically mapped into the SD via connectors, and then mapped into the TD. In the SD and the TD, each image-schema invokes an inference that contributes to the meaning of the metaphor, as well as that of the linguistic item to which it corresponds.

The following section (drawing upon Lakoff 1987) describes the image-schemata that are invoked with this metaphor. [18]

5.1 The CONTAINER Schema

The CONTAINER schema, (represented by **a** above) is comprised of the following structural elements: INTERIOR, EXTERIOR, and BOUNDARY. This schema exists at the preconceptual level, as do all basic image-schemata. [19] Figure I illustrates that when **a** maps into the SD, it

Figure I

UNDERSTANDING IS SEEING
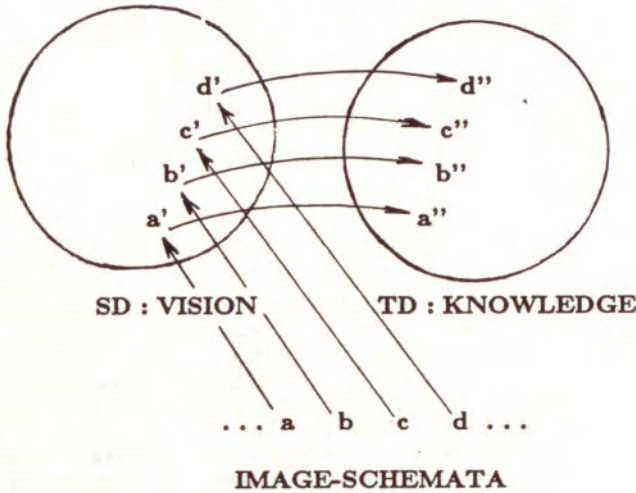
a : container	b : link
a' : VF = container	b' : agent views entity
a'': mind = container	b'': agent cognizes entity

c : part-whole	d : path
c' : view part/recognize whole	d' : line of sight
c'': cognize part/cognize whole	d'': direction of attention

renders *Visual Field = Container* (a'). When it maps into the TD, it is realized as *Mind = Container* (a'').[20] Linguistic evidence for this can be seen in cases such as *let me see your argument*, in which the agent tells the patient to bring the argument into her realm of thought. This is much like the visual field in sentences such as *bring the spaceship into my visual field*.

5.2 The LINK Schema

The *link schema* (b), is comprised of the following:

A and *B*, and LINK connecting them

Simply stated, two entities, *A* and *B*, are linked by virtue of their relationship. In the SD, this relation is invoked such that the viewer and the viewed entity are linked through visual contact. This inference (b') is

then transferred into the TD to indicate *mental contact* (b''). Evidence for this mapping is seen in examples such as *I've got it now. I see the point you are making*, in which the agent connects with an idea. This is much like the viewer making visual contact as in *I caught sight of him.*

5.3 The PART-WHOLE Schema

The PART-WHOLE image-schema is evokes a part referring to its whole. This is motivated by the fact that in viewing an object, we only see part of it, but recognize it as a whole. This schema (c) is made up of the following structural elements: WHOLE, PARTS, CONFIGURATION. It is mapped into the SD (c') and realized as:

seeing part of something is seeing all of it

It is realized in the TD (c'') where it is instantiated as:

being partially informed about something is knowing all of it

This mapping can be supported by situations such as the following: The owner of a store upon walking into his shop utters, "I see," when he notices that the money from the cash register is gone. Even though he did not visually perceive the robbery taking place, he deduces from physical results that somebody took the money. This is conceptually similar to looking at an object such as a tree and knowing that it is three-dimensional.

5.4 The SOURCE-PATH-GOAL Schema

This basic image-schema (d) is comprised of the following structural elements:

> A SOURCE (starting point), a DESTINATION (endpoint),
> a PATH (a sequence of contiguous locations connecting source and destination), and a DIRECTION (toward the destination).

At the preconceptual level, this image-schema is a trajectory that has endpoints, an origin, and a goal. In the SD, it (d') is realized as the viewer's line of sight. Evidence for this is the following: *get out of the way, you are blocking my line of sight.* In the TD, this (d'') is realized as focus of attention.

6.0 Advantages

Presented was a model using notions from Lakoff's (1987) basic image-schemata and Fauconnier's (1985) theory of *mental spaces*. The *Understanding is Seeing* metaphor was mapped using mental spaces to represent the SD and TD, and connectors to map image-schemata (generated at the preconceptual level) from the SD to the TD. In doing so, it was seen that much of the mapping was driven by basic image-schemata.

There are many advantages to approaching metaphorical extension in this way. For instance, we avoid some of the standard problems faced by researchers working in this area, e.g. how much structure exists in the TD, the nature of the elements that are mapped (from the SD to the TD), and how they are mapped. By focusing on the function of the

image-schemata in mapping, we obtain many inferences for free. For instance, as was seen with the *US* metaphor, the viewer is ultimately transformed into the mental experiencer, and visual processing into mental processing. Both of these inferences emerge in the TD. Moreover, much generality is captured in that the basic integrity of each of the image-schemata is maintained throughout/across the mapping.

This model is not only theoretically elegant, but perhaps more plausible as to what happens at the cognitive level than other approaches to metaphor. Specifically, in this approach, image-schemata could conceivably constitute (part of) the link between visual and linguistic processing. This is hinted at in this paper in that aspects of the conceptualization of the viewing arrangement emerge eventually in the SD and TD, e.g. *Visual Field=Container, Mind=Container*. Finally, this model can be extended to mapping complex metaphors (involving multiple domains) by appealing to *multiple connectors.*[2] (This is currently being explored by the author and Eve Sweetser as work in progress.)

7.0 Future Research

This research will be extended to verbs of perception other than *see*, including the visual verbs *watch* and *look*, and non-visual verbs such as *listen, hear*, and *feel*, hopefully eventuating into a survey of the semantic and grammatical nature of verbs of perception. In the future, I hope to extend the proposed model to mapping a variety of metaphors in English and in other languages.

8.0 Conclusion

This paper analyzed the various meanings of the verb *to see*. The dynamics of visual processing and the visual setting were discussed, as was their importance to conceptual structure. A metaphorical extension, *see = know*, was shown to be motivated by the *Understanding is Seeing* metaphor. Additionally, a model based on notions from Fauconnier's *Mental Spaces* was presented that explicated the role of image-schemata in the structuring of basic conceptual metaphors. Hopefully, the proposed model for analyzing metaphorical extension says something about the structure of metaphor, and that this approach to analyzing verbs of perception says something about the relation between language and perception.

Notes

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1. See Barwise and Perry 1984.

2. An ICM (*idealized cognitive model*) is an organized knowledge structure (similar in some respects to Langacker's (1987) *cognitive domain* and Fillmore's (1982) *frame*).

3. Jackendoff (1985:6) stresses the importance of the relation of vision to language

determining and analyzing semantic structure related to talking about what we see.

4. See Lakoff and Johnson 1980.

5. This has interesting grammatical ramifications which will be discussed in a later paper.

6. Langacker's (1987) model is similar to Lakoff's (1987) *Radial Model*. They both demonstrate the advantages of such models for explaining the semantic structure of polysemous words over other approaches.

7. Finke 1986 and others have argued conclusively for the connection between mental imagery and visual perception by showing that they utilize similar neurological processes.

8. According to Sweetser (p.c.) this phenomenon is common crosslinguistically.

9. See Matlock 1989 (to appear).

10. For independent evidence and compelling arguments to support the existence of spatial notions such as *path*, and their effects on linguistic structure and meaning, see the work of Talmy 1983 and Langacker 1987.

11. This is argued for in: Lakoff and Johnson 1980, Lakoff 1987, Turner 1987, Lakoff and Turner 1988, and elsewhere.

12. See Turner 1987.

13. From Lakoff and Johnson 1980, Lakoff 1987, Turner 1987, and Lakoff and Turner 1988.

14. See Fauconnier 1985.

15. Lakoff 1987 discusses basic image-schemata, and suggests that they are important to metaphorical structure, but he does not explicate *what* they do, *how* they interact, or *how* they are structured in metaphorical mapping.

16. See Sweetser for insightful discussion.

17. At this point I make no claims as to temporal processing. Only in-depth psycholinguistic research can determine whether this process occurs simultaneously or sequentially.

18. See Lakoff 1987 for a comprehensive discussion of the image-schemata mentioned in this section.

19. See Johnson 1987 and Lakoff 1987.

20. These are standard metaphors in Lakoff and Johnson 1980.

21. See Fauconnier 1985.

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Subjacency and Case Marking In Japanese[*]

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0.   It is proposed in Chomsky (1981,1986a,b) that Nominative and Accusative Cases are assigned by the following system in English.

(1) NP is assigned a) Nominative if governed by INFL, and
                          b) Accusative if governed by a transitive verb

The definition of government in Chomsky (1981) is different from the one in Chomsky (1986b) in terms of 'barrierhood.'[1] In the present study, for languages like Japanese, I adopt the latter definition, based on the notion of m-command (cf.Aoun and Sportiche (1983)), although I remove barrierhood on the projection level.

(2) a. Government
        α governs β iff α m-commands β.   (cf. Chomsky,1986b)
    b. M-command
        α m-commands β iff α does not dominate β and every γ, γ a
        maximal projection, that dominates α dominates β.
                                (cf. Aoun and Sportiche, 1983)

Since there is no barrierhood in (2a), it must be determined by principles like 'Minimality' in Chomsky (1986b) (In fact, this approach is also pursued in Suzuki (1988)).
        Within the framework of Government and Binding theory, it is proposed in Takezawa (1987) that the sytem (1) should also work for Japanese,[2] although his (1a) is different from Saito's (1983,1985). Thus, accepting the configurational nature of Japanese (cf. Saito(1985), Hoji (1985), etc.), Takezawa's system assigns Nominative and Accusative Cases in the following tree, where word order is fixed according to the head right or head left parameter (cf. Stowell (1981)):

(3)

```
                         IP(=S)
                NP₁              I'
                          I          VP
                       [+TNS]    V        NP₂
```
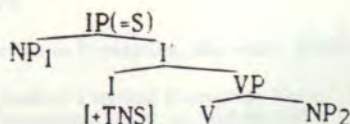
The NP$_1$ is assigned Nominative by the head INFL, and the NP$_2$, Accusative by the V. This is illustrated by 'regular' sentences in (4).

(4) a. Japanese:
    John-ga   ringo-o   tabe-ta.
      -NOM apples-ACC eat-PAST
    'John ate apples.'
  b. English:
    He ('Him) ate them ('they).
    NOM(ACC)   ACC (NOM)

The subject is normally accompanied by the Nominative Case marker ga (a phonological realization of Nominative Case), and the object, by the Accusative Case marker o (a phonological realization of Accusative) in regular Japanese sentences, similar to the subject pronoun taking the Nominative form and the object, the Accusative form in English.

Although I agree with Takezawa that the Case assignment system is basically the same for Japanese and English (and presumably for other languages), there are differences as to the number of times and the way that Cases are assigned. In this paper, I will examine what parameter will determine those differences, focusing our discussion on Nominative and Accusative in Japanese. It will be suggested that the Minimality Principle is dependent on the property of the Case feature that the head X has. It will be also suggested that the notion of Subjacency is related to Japanese Case assignment. And this line of study will be extended to Genitive Case assignment in Japanese.

1.   To begin with, let us consider the generalizations about Case marking in Japanese, listed in (5).

(5) a. More than one Nominative Case marker can occur in an independent sentence, while Accusative is limited to one in Japanese.
    b. Nominative and Accustive Case markers can occur in places distant from the 'governing' head in Japanese.

(5a) is exemplified in (6a-b).

(6) a. Bunmeikoku-ga   dansei-ga heikinzyumyoo-ga
       civilized countries-NOM men-NOM average life span-NOM
       mizika-i.
       short-PRES
       'It is in civilized countries (in which) men are (such that) their
       average life span is short.'   (Kuno,1973a,34)
    b. John-ga Mary-ni/*-o   kodomo-o sikar-ase-ta.
       -NOM   -DAT/-ACC child-ACC scold-CAUS-PAST
       (lit.) John made Mary scold the child.'

As seen in (6a), more than one ga can occur in an independent
sentence. But o can occur at most once in an independent sentence, as
in (6b) (cf. the Double Q constraint in Harada (1973), Poser (1981)).
       The other generalization (5b) is illustrated by examples (7a-c)
and (8a-c).

(7) a. [IP[NPBunmeikoku-ga [N' dansei-ga [N heikinzyumyoo]]]-ga
       mizika-i].   '=(6a)'
    b. Aiko-ga [VP[NP kono hon-ga [N naiyoo]]-ga wakar]-anai.
       -NOM   this book-NOM content-NOM understand-NEG
       'It is Aiko who does not understand the content of this book.'
    c. [PP[NP[NPNew York]-ga koogai]-ni] yoi zyuutaku-ga   aru.
                          -NOM suburbs in good residential area are
       'In the suburbs of New York, there are good residential areas.'
                                              (Kuno,1973a;366)
(8) a. John-ga [CP[IP Mary-ga/-o   baka da] to] omot-ta
       -NOM   -NOM/ACC fool be COMP think-PAST
       'John thought that Mary was a fool.'
    b. John-ga [CP[IPAiko-ga [VPeigo-o   wakar]-u] to]   omot-ta.
                           English-ACC understand-PRES-COMP thought
       'John thought that Aiko understsnds English.'
    c. John-ga [CP[IPAiko-ga [AP inu-o   kirai] da] to] omot-ta.
                              dog-ACC dislike be COMP think-PAST
       'John thought that Aiko disliked dogs.'

As seen above, the Case markers ga and o can occur separated from
their heads by phrases. In (7a-c), I give the D-structure at the time of
the Nominative assignment, although all the NP+ga phrases in (7a) and
(7c) are considered to be directly dominated by IP(=S), due to the
'Subjectivization' in Kuno (1973a). In these cases, Nominative ga is

assigned across NP in (7a), VP and NP in (7b), and PP and NP in (7c).

On the other hand, Accusative Case is assigned across IP and/or VP/AP in (8a-c).[3]   Notice that the embedded predicates (baka, wakar, kira) are not Accusative Case-assigners, as seen in (9a-c)

(9) a. Mary-ga/*-o baka da
      'Mary is a fool.'
   b. Aiko-ga [vp eigo-ga/*-o wakar]-u.
      'Aiko understands English.'
   c. Aiko-ga [ap inu-ga/*-o kirai] da.
      'Aiko dislikes dogs.'

It appears that Accusative o must be assigned by the matrix verb omow in (7a-c). What these sentences indicate is that Accusative can be assigned further down than widely believed, here into a lower S. This point has gone unnoticed in the past.

With respect to the Accusative Case assignment, there is a limit on the above generalization. It seems that Accusative o cannot be assigned even across one NP:

(10) * John-ga [NP[NP Mary]-o kodomo]-o/-ga   sikat-ta.
        -NOM   -ACC child-ACC/-NOM scold-PAST
      '(lit.) *John scolded Mary, her child.'

This point will be discussed later in conjunction with the Minimality Principle and the lexical specification of the Case feature that the verb has.

Thus, although there is an exceptional case, both Nominative and Accusative can be assigned further down than in English. However, there is a limit to this in that the head X can govern and assign Case in the context schematized below.

(11)   ...[... [α ...[α ... NP ...] ...] ... X] ... , where α -NP or IP

(11) is illustrated by examples like (12) and (13a-b).

(12) [NP[NP[NPTanaka-sensei]-no/*ga   yuuzin]-no Yamada-san]-ga
                    -teacher-GEN/NOM friend-GEN   -NOM
      kimasi-ta.
      come-PAST

'Mr. Yamada, a friend of Prof. Tanaka, came.'
(13) a. John-wa [IP[NP Mary-no/*-o kodomo]-ni utaw]-ase-ta.
      -TOP   -GEN/ACC child-DAT   sing-CAUS-TAST
    'John made Mary's child sing.'
   b. John-wa [IP[NPMary-no/*-o musuko]-ga baka da to] omot-ta.
                              son-NOM fool be COMP think-PAST
   'John thought that Mary's son was a fool.'

The outside head INFL and V cannot assign Nominative and
Accusative to the deeply embedded NP in (12) and (13a-b),
respectively.

     Thus far, we have seen descriptively how many Nominative and
Accusative can be assigned in an independent sentence and how they
should be assigned. In the next section, an account of the above
limited generalizations will be provided based on the principles of
Subjacency and Minimality, which will determine what constitutes
barrierhood for government in Japanese.

2.   In light of the generalizations (5a-b), I will first consider
whether or not the Minimality Principle which is assumed in English
in Chomsky (1986b) is operative in Japanese. Before doing that, I will
clarify this principle. It is a locality condition on government set up
independently of bar notation projections. It can be informally stated
that a governor X cannot govern Z inside the domain of another
governor Y(i.e., if there is another closer governor) in (14).

(14) ... X ... [...Y ... Z ...

This implicitly assumes that a governor has a Case-assigning property.
Put differently, a governor has a Case feature [+F] obligatorily as a
lexical property of a head, which will be 'discharged' (assigned) to a
closer governee(s) due to Case Filter (15).

(15) Case Filter
      * NP if NP has phonetic content and no Case (Chomsky,1981)

It seems that Minimality depends on the obligatoriness of the Case
feature that a governor has. In other words, if the Case-assigning
feature is obligatory, Minimality must be operative. If this is correct,
this principle is dependent on the Case-feature-bearing property of

each head. Thus, for example, a head in general has one obligatory Case feature in English, as seen in (16) [4].

(16) a. * [$_{NP}$[$_{NP}$John] brother] ate apples.
　　　　　NOM　NOM
　　　b. * John ate [$_{NP}$[$_{NP}$ him] apples].
　　　　　　　　ACC　ACC

Due to the Case-assigning property, the head INFL or V cannot assign two Cases: i.e., Minimality must be observed.

We should not be confused here that the obligatory Case-assigning feature of each head does not force itself to assign the feature to its governee(s). Basically, Case-assignability should be optional, following Emonds (1985) and Chomsky (1986a). It is the Case Filter that is responsible for rendering Case-assigning obligatory at S-structure, following Emonds (1985).

With this much understanding of the Minimality Principle, let us consider the generalizations (5a-b). It seems obvious that Nominative Case is not subject to this principle in Japanese, since it is possible for a farther governor to govern an NP that is also governed by a closer governor. This is illustrated in the tree (17).

(17)
```
                        IP
              _____/_____
            NP₀                    I'
         __/____            _____/_____
       NP₁      N                         I
        ⌐ - - - - Case-assign. ⌐
```
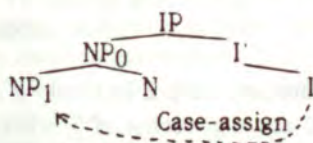
The closer governor to the NP_1 is N, but the INFL can assign Case to it; e.g., (6a). (Note that the NP_0 is a barrier in Chomsky (1986b), but it is not here by (2a); i.e., barrierhood on the projection level is not necessary.) On the other hand, Accusative Case seems subject to Minimality, looking at examples like (10). That is, the normal verbs like sika 'scold', tabe 'eat', etc. seem to have the Case feature [+F] obligatorily in Japanese, too. However, the exception to this is a Japanese version of 'ECM'.[5] The relevant examples are in (8a-c), where the the omow-type verbs are not specified to have an obligatory Case feature in the lexicon, but they do have an optional feature. If this is assumed, it follows that Minimality is optional in (8a-c), just as Minimality is optional in the ECM in English (cf. footnote 4).

To summarize, the operation of Minimality is parametrized as to whether the property of a governor assigns Case obligatorily or not, both in English and Japanese. Thus, Minimality is normally operative in English, since each governor has normally one obligatory Case feature.[6]   Whereas in Japanese, Minimality is operative only in the case of the normal Accusative-assigning verb, so that Nominative and Accusative in the ECM have more varied realizations than widely believed.[7,8]

3.   If the preceding conclusion is correct, it should be possible for Nominative and ECM-type Accusative to be assigned downward in a tree without limit. However, as schematized in (11), we need to specify the condition on this limit. In order to exclude the starred examples in (12) and (13a-b), as in the illustration (11), I claim that although the principle of Subjacency (18) is originally a condition on movement (cf. Chomsky,1981,1986a,b), Case assignment is in fact also subject to it, assuming a 'governing category' (19).

(18) Subjacency
        X and Y cannot be related in the configuaration of
        ...X...$[_\alpha$ ...$[_\beta$ ...Y...] ...] ... X...
                , where α and β are governing categories (NP & S[-IP])
                                                                (cf. Chomsky,1977)

(19) Governing Category
        α is the governing category for β if and only if α is the minimal
        category containing β and a governor of β, where α -NP or S [IP]
                                                                (Chomsky,1981;188)

Given these, the starred examples in (12) and (13a-b) are excluded, since the head and the NP in question are illicitly related across two governing categories. On the other hand, (7a-c) and (8a-c) do not violate subjacency, since there is only one governing category NP and IP being crossed, respectively.

        Thus, an account of Nominative and Accusative Cases has been provided for Japanese, referring to the principles of Minimality and Subjacency. If this approach is correct, there is no reason to exclude Genitive Case (realized as no), which behaves exactly the same way as Nominative and Accusative, from the system (1) in Japanese. The incorporation of Genitive into Nominative and Accusative Cases will be a welcome result for the unification of the major Cases. In the

following section, I will provide arguments that Genitive is assigned under government.

4.   There are two arguments for the treatment of Genitive under government. In providing them, I will briefly contrast the proposed analysis with the ones in Saito (1983,1985) and Takezawa (1987). First, Genitive no can occur basically without a limit of their number in a phrase (cf.(5a)):

(20) [NPSakunen-no [N' Nihon-no [N' keizai-no [Nseityoo]]]]
      last year-GEN   Japan-GEN   economy-GEN growth
      'last year's Japanese economic growth'

This is accounted for by the lexical specification of the N head; there is an optional Case-assigning feature (i.e., Minimality is not obligatorily operative).

    In contrast, Saito(1983,1985) holds that the presence of the genitive Case marker no in (20) can appear in the context of (21) in Japanese, following the traditinal view:

(21)   [NP NP__ N/NP].

Therefore, my argument is in some sense neutralized in that either the proposed or Saito's approach can account for the multiple Genitive Cases, though Saito's approach requires the stipulated context for Genitive assignment.

    Another independent argument that Genitive should be assigned under government is concerned with the way Genitive is assigned (cf. (5b)). This argument is based on three pieces of evidence. First, let us consider (22), involving a relative clause.

(22) a. [NP [IP Aiko-ga   tabe-ta] [NP aisukuriimu]]
              -NOM eat-PAST   ice cream
    'ice cream that Aiko ate'
   b. [NP [IP Aiko-no tabe-ta] [NP aisukuriimu]]
              -GEN eat-PAST   ice cream
    'ice cream that Aiko ate'

The phrase Aiko-no in (22b), which parallels to the subject Aiko-ga in (22a), is not a complement of the NP aisukuriimu, since it functions as the subject of the embedded clause. (The ga-no alternation in (22a-b)

is the so-called <u>GA-NO</u> Conversion phenomenon. Cf. Harada (1971))
If this is correct, Genitive is assigned across one governing category
IP.[9,10]

As for subjecthood, I accept the claim made in Shibatani (1977,
1978) that a subject is an NP that functions as a trigger for the process
of 'Subject Honorification' and 'Reflexivization':

(23) a. Sensei-no   o-tabe-ninat-ta   aisukuriimu
      teacher-GEN HON-eat-become-PAST ice cream
      'ice cream that the teacher ate (Hon.)'
    b. John$_i$-no Mary$_j$-o [zibuni,*$_j$-no uti-de] sikat-ta   koto
       -GEN   self-GEN   house-at scold-PAST fact
      'the fact that John scolded Mary in his house'

Thus, <u>sensei-no</u> and <u>John-no</u> in (23a-b) are subjects. It follows that a
subject with <u>no</u> is immediately dominated by the embedded clause IP,
not by the larger NP. Hence, the Government approach to Genitive
holds, in that the Genitive Case inside IP is assigned by the outside
head N.

In contrast, Saito (1983, 1985) might account for the <u>ga-no</u>
alternation in (22a-b), using a process of Restructuring proposed in
Bedell (1972). What this process basically does is to extract a leftmost
NP from within relative and prenominal modification clauses and
adjoin it to the larger NP, so that it feeds insertion of Genitive Case
under the context of (24a)(cf.(21)), the tree for which is provided in
(24b).

(24) a. [$_{NP}$ NP__ NP]

   b.   NP
         NP   NP
            S   N/NP
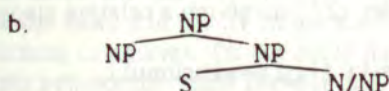
<u>Ga</u> is assigned contextually in Saito's system, just like his Genitive
Case. So, the first NP in (22a) is restructured as in (22b), where <u>no</u> is
inserted. Although his approach seems to work descriptively, there is
a problem of interpreting the subject, because Restructuring does not
leave a trace behind, as assumed in Saito (1983).[11]   That is, the
problem is how to interpret the restructured NP as the subject of the
clause.

On the other hand, Takezawa (1987) has not taken up the important issue of the ga-no alternation at all. But, assuming his system of obligatory Case assignment, he will encounter a problem of eliminating Nominative Case in (22b) at the time of Genitive Case assignment, regardless of government.

Another piece of evidence for Genitive Case assignment under government is provided by considering the multiple-Nominative construction which is a complement to an N head, as in (25a). Here, the GA-NO Conversion phenomenon is also observed, as in (25b).

(25) a. $[_{NP}[_{IP}[_{NP}$ fuyu-ga $[_{N'}$ Siatoru-ga $[_N$ ame]]]-ga
             winter-NOM   Seattle-NOM   rain-NOM
     $[_{AP}$ oo] $[_{TNS}$ i]] $[_N$ koto]]
        much-PTES   fact
     'the fact that it rains very often in Seattle in winter.'
    b. fuyu-ga Siatoru-ga ame-no oo-i koto
                        -GEN

As seen in (25a-b), the right-most ga appears to be converted to no, which is not in the context of (24a), as seen in the tree (26a). Even if we assume the NP+ga phrase to be dominated by IP, as in (26b), following Saito, no is still not in the context of (24a).

(26) a.

What this indicates is that this no is obviously assigned by the outside head N. This is predicted by the adoption of my Government approach, since the Case assignment observes Subjacency.

By contrast, there is no way of deriving (25b) in Saito's analysis, since the requirement for the no assignment illustrated in (21) is not met but no appears. Nor is Takezawa's system capable of accounting for this particular no, due to his obligatory assignment of Nominative by INFL.

A final piece of evidence is concerned with the ga-no alternation in object position, where the object NP is directly dominated by AP or VP.

(27) a. [NP [IP John-ga [AP tenisu-ga/-no suki]-na] koto]
                 -NOM   tennis-NOM/GEN like-be   fact
      'the fact that John likes tennis'
    b. [NP[IP Aiko-ga/-ni [VP eigo-ga/-no   deki]-ru] koto]
                 -NOM/-DAT   English-NOM/GEN can -PRES fact
      'the fact that Aiko can speak English'

As seen above, Genitive no can appear with the object NP of the head A (suki) or V (deki), which generally selects the nominative object in an independent sentence (cf. Kuno (1973a)):

(28) a. John-ga tenisu-ga/*-no suki da.
         'John likes tennis.'
    b. Aiko-ga/-ni eigo-ga/*-no deki-ru.
         'Aiko can speak English.'

Thus, Genitive no can appear in the embedded object position. In my proposed analysis, this Genitive Case assignment is allowed, since Subjacency is observed; there is one intervening governing category IP in (27a-b). On the other hand, this is the same problem with Saito (1983,1985), as we saw concerning (25b).

Thus, we have seen that my system of Genitive Case assignement, which is unified with the assignment of Nominative and Accusative, has better explanatory power than Saito's with respect to the ga-no alternation.

5.   In conclusion, I have claimed that Subjacency plays an important role in Case assignment in Japanese, based on the descriptive generalizations for Nominative and Accusative Cases (5a-b) in Japanese. These generalizations made us clarify that the Minimality Principle, which determines barrierhood, is parametrized, depending upon the Case-assigning property of each head. I showed that in Japanese, Minimality captures only the normal Accusative Case assignment, whereas in English, Minimality seems to capture all Cases. It was also shown that Genitive Case is incorporated into my Case system under government for the unification of the major Cases.

Footnotes

* I would like to thank Joe Emonds for his advice and useful comments.

1. See Chomsky (1986b) for the details of the notion of barrierhood.

2. Although it is claimed in Takezawa (1987) that [+TENSE] inside INFL is responsible for Nominative Case-marking in Japanese, a certain range of data cannot be accounted for in his system; e.g., an infinitive sentence. However, it is suggested in Morikawa (in preparation) that another syntactic feature AGR inside INFL should be responsible for nominative Case-marking. In the present paper, I will not go into detail, since the choice of [+TENSE] or AGR is not directly related to the discussion below.

3. There is variation in acceptability if the embedded predicates are AP's like zyoozu, heta, etc..

(i) a. ? John-ga [Mary-ga [uta-o   heta da to]   omot-ta.
          -NOM   -NOM song-ACC bad be COMP think-PAST
      'John thought that Mary was not good at singing.'

(i) seems unaccptable to some people, but the judgment improves if the NP utaw in (i) is replaced by utau-no, as in (ii).

(ii) John-ga [Mary-ga [NP[IP uta-u]   -no]-o   heta da to] omot-ta
                              sing-PRES-GEN-ACC
      'John thought that Mary was not good at singing.'

I do not know why the judgment differes between (i) and (ii). But it is clear that Accusative o is assigned by the matrix verb, as the following illustrates.

(iii) John-ga [NP[IP uta-u]-no]-ga/*-o heta da
      'John is not good at singing.'

The embedded part of (ii) is ungrammatical as an independent sentence, if the phrase utauno is assigned Accusative, as in (iii). This is because the predicate heta is not an Accusative Case assigner, as claimed in the text.

4. One exception to this is the so-called Exceptioanl Case Marking ("ECM")

(i) a. * Mary believes [NP him honesty].
    b. Mary believes [IP him to be honest].
    c. * Mary believes [CP that him is honest].

The Case feature of verbs like believe may be assumed to be optional, so that Minimality is optional as far as Accusative Case-marking is concerned. But, the other Case assigner INFL and N (cf. Suzuki (1988)) observes Minimality, so that (ia) and (ic) are excluded. As for (ib), the optional application of the Minimality makes it possible for the V to assign Case, since the embedded subject position is

ungoverned (i.e., Minimality is not operative due to the [-TNS] (or the Case feature [-F]) within the embedded clause.

5 .   The 'Indirect Question' construction is another possible exception, since Accusative cannot be assigned inside the proposition clause by the matrix verb. However, from the fact that the entire proposition clause can be assigned Accusative o as in (i), we can regard the proposition to be dominated by another NP or the proposition to behave like NP in terms of Case assignment.

(i) Watasi-wa Mary-ni [John-ga asu   kur-ru ka(dooka)]-o tazune-ta.
    I-TOP   -DAT   -NOM tomorrow come-PRES-Q-ACC   ask-PAST

In either case, the Subjacency Principle prevents Accusative from going down to the inside of the proposition, since the Case-receiving proposition itself is assigned no Case, violating Case Filter.

6 .   It requires a careful analysis, but it is generally thought that Minimality is obeyed even in the ECM construction in English.

7 .   As for P, I assume that a lexical P has an obligatory Case feature in general, Minimality being operative:

(i) * John-ga [PP[NP Tokyo]-ga (kara)] ki-ta   'John came from Tokyo.'
    -NOM   -NOM from   come-PAST

Nominative cannot be assigned across PP in(i). But this is not true for examples like (7c) in the text, where I assume that the P of PP in the existential sentence (7c) must be null but has an optional Case feature [+F] in the base, so that Minimality is not always operative. This type of P theoretically supports the Invisible Category Principle ("ICP") in Emonds (1985,1987,1988), which typically permits the closed grammatical categories SP(X) or INFL paired with a head X to be empty. Due to the space limit, I leave out its illustration.

8 .   It is reported in Han (1987) that it is possible to have multiple objects in Korean.

(i) Chelswu-ka Swuni-lul meli-lul   seypen-ul ttayliessata.
        -NOM   -ACC head-ACC 3 times-ACC beat
    'Chelswu hit Swuni on the head three times.'   Han (1987;113)

This fact lends support to my proposed analysis in that Minimality must be parametrized as to the Case-assigning property of the head X.

9 .   It must be noted that no is blocked from apearing if there is a transitive verb assigning accusative Case.

(i) [[John-ga aisukuriimu-o/*-no tabe-ta] koto]
        -NOM ice cream-ACC/GEN eat-PAST fact
    'the fact that John ate ice cream'

In my analysis, this is attributed to the Minimality Principle due to the obligatory nature of accusative Case feature on a transitive verb, i e , Genitive

Case is not assigned, since the closer governor to the embedded object NP is the verb tabe.

10 . Note that I do not count the NP aisukuriimu as a governing category in this particular context, since it is the 'same type' as the larger NP (cf. a revised version of the definition of c-command in Reinhart (1976)). Technically, the definition of M-command (2b) in the text must be revised as follows:

(i) M-command (revised):

α m-commands β iff α does not dominate β and every γ, γ a maximal projection, that dominates α includes β.

cf. α is dominated by β only if it is dominated by every segment of β. (cf. Chomsky. 1986b)

α includes β if a segment of α dominates β. (cf. Chomsky, 1986b)

I leave out the detailed discussion of (i) due to the limited space here, but this point is fully discussed in my other work in progress.

11 . If a restructured NP left its trace, the variable would not have Case due to the contextual introduction of Nominative Case, as said in the text. According to Saito (1983), this is a violation of the following principle that he cites from Chomsky (1981).

(i) Variables must have Case

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Transitivity and the Encoding of Narrative Events in the Process-oriented Language: A Case from Japanese

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0. The Transitivity Hypothesis (TrHy) as formulated in Hopper & Thompson (1980) has been the basis of a variety of subsequent studies. However, compared with the body of works on the co-variance of Tr parameters in individual constructions, the relation of the high Transitivity (HiTr) clauses to the global organization of discourse, as one of the key tenets of TrHy, has not been extensively studied. This problem definitely deserves further scrutiny, since what motivates the discourse basis of grammar is precisely its relevance to the macro-level processing of discourse.

In this paper, I will first try to examine the discourse function of Tr in Japanese and English by looking at how the plot structure, as one of the central part of the macro-structure of narrative discourse, is encoded via Tr. Then I will focus on the ways in which these languages differ in the encoding of narrative events in terms of the preference of Tr. The differences are subtle, but systematic enough to draw some typological generalizations. I will particularly put the major emphasis on the latter issue.

1. TrHy, as it stands, is a complex of statements about the grammar-discourse interface, whose parameters and the key statement are reproduced below (Hopper and Thompson 1980: 252):

(1)	HIGH	LOW
PARTICIPANTS	two or more, A & O	one
KINESIS	action	non-action
ASPECT	telic	atelic
PUNCTUALITY	punctual	non-punctual
VOLITIONALITY	volitional	non-volitional
AFFIRMATION	affirmative	negative
MODE	realis	irrealis
AGENCY	A high in potency	A low in potency
AFFECTEDNESS OF O	O totally affected	O not affected
INDIVIDUATION OF O	O highly individuated	O non-individuated

"If two clauses (a) and (b) in a language differ in that (a) is higher in Tr according to any of the features above, then, if a concomitant grammatical or semantic difference appears elsewhere in the clause, that difference will also show (a) to be higher in Tr." (ibid.: 255, slightly modified)

The co-variance of parameters itself is not really disputable, and has been well attested across many languages. The hypothesis that is probably the most controversial is the exact nature of foregrounding as the discourse function of HiTr clauses. According to the original formulation, they are said to have two functions:

(2a) "First, the foregrounded portions together comprise the backbone or skeleton of the text, forming its basic structure; the backgrounded clauses put flesh on the skeleton, but are extraneous to its structural coherence."

(2b) "Second, the foregrounded clauses are ordered..in a temporal sequence; a change in the order of any two of them signals a change in the order of real-world events. Backgrounded clauses, however, are not ordered with respect to each other, and may even be movable with respect to the foregrounded portions." (ibid.: 281)

Let us call (2a) "backbone" criterion, and (2b) "sequentiality" criterion (also cf. ibid.: 294). It may be worth pointing out that this distinction corresponds to the kernel/satellite distinction in the theory of narrative structure, e.g. Chatman (1978).

Originally these two discourse functions were assumed to be in the relation of mutual implication. But later studies came to claim that they only partially overlap, and that the primary function of Tr is to encode sequentiality (cf. Kalmár 1982 and Tomlin 1987). Now let us look at how things work in Japanese and English.

2. The data consists of three Japanese folktales taken from the volumes recorded and compiled by the folklorist Keigo Seki (1956): #1, "Kikimimi" ('The magic ear'), #2, "Tenbuku cibuku" ('Luck from heaven and luck from earth'), and #3, "Issunbousi" ('Little One Inch'). [1] They were originally told in the oral form, though in print no conversational peculiarities are left. Later, they were translated

into English under the supervision of Richard Dorson (1963) as a volume in the series, *Folktales of the World*, which is intended for the general reader. In this way, that we have the English free translation as well as the Japanese original enables us to compare the figures of discourse in these languages with certain credibility. So we shall be looking at the original, gloss, literal translation (which might be odd as English), and free translation.

The decision to use folktales as data is motivated on the grounds that: (a) they preserve the oral tradition, and may be less influenced by the Western idiom; (b) they form an established discourse genre, and the framework for analyzing the plot structure is widely available (cf. Propp 1928, Dundes 1964, Bremond 1964, Greimas 1970, among others); (c) they are what I call the "first-order narrative", and thus without (post-)modernistic twists (i.e. they do not usually exploit the conventions of the genre).

2.1 The result of analysis is shown in the tables of (3). In the course of analysis, first I made a chart which is partially reproduced at the top (* indicates clauses that have not been put into English). It contains the values of Tr in Japanese and English (under Tr), and the values of backbone-hood and sequentiality (under Ds). The scalar nature of such concepts is obvious, but for the sake of convenience, I adopted the binary notation. Generally, + was given to the clauses with the Tr value above 6, and - to those below 5. In this process, I conducted some informant test to elicit the summary of each story, sometimes orally and sometimes in the written form. The number of informants is very small (viz. 6) due to the preliminary nature of this study, but they agreed fairly well as to which parts of discourse would constitute the backbone of the plot. Below I give the percentage of each category in the form of correlation table. On the left is the correlation between Tr and backbone-hood, and on the right is that between Tr and sequentiality:

(3) #1. Kikimimi ('The magic ear'): 161 clauses

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	...
Tr:																	
Jap.	5	4	3	2	2	2	3	8	4	6	10	7	3	5	3	8	...
Eng.	4	7	3	*	4	8	8	8	4	*	10	7	3	5	3	6	...
Ds:																	
Bck.	+	+	-	-	-	-	-	-	-	-	+	-	-	-	+	+	...
Seq.	-	+	-	-	-	+	+	-	-	+	+	-	-	+	-	+	...

%	Backbone-hood		%	Sequentiality		
Tr	+	-	Tr	+	-	
+	J 11	J 17	+	J 14	J 13	(-12)
	E 11	E 16		E 12	E 14	(-13)
-	J 17	J 55	-	J 14	J 59	
	E 19	E 54		E 16	E 58	

#2. Tenbuku cibuku ('Luck from heaven and luck from earth'): 97 clauses

%	Backbone-hood		%	Sequentiality		
Tr	+	-	Tr	+	-	
+	J 10	J 7	+	J 14	J 2	(-2)
	E 11	E 12		E 18	E 7	(-7)
-	J 16	J 67	-	J 18	J 66	
	E 14	E 63		E 12	E 63	

#3. Issunbousi ('Little One Inch'): 82 clauses

%	Backbone-hood		%	Sequentiality		
Tr	+	-	Tr	+	-	
+	J 15	J 10	+	J 23	J 1	(-1)
	E 17	E 11		E 22	E 7	(-7)
-	J 20	J 55	-	J 15	J 61	
	E 17	E 55		E 15	E 56	

#1-3 total: 340 clauses

%	Backbone-hood		%	Sequentiality		
Tr	+	-	Tr	+	-	
+	J 9	J 12	+	J 16	J 7	(-6)
	E 12	E 14		E 16	E 11	(-10)
-	J 19	J 60	-	J 15	J 62	
	E 17	E 57		E 15	E 58	

Now, how should we interpret this result? First of all, as can be clearly seen, there is hardly any significant correlation between HiTr clauses and the backbone-hood (cf. the tables at the bottom, which show the total of all the three stories involving 340 clauses). Clauses with HiTr and forming the backbone of the plot structure are only 9% in Japanese and 12% in English, whereas those with HiTr but do not form the backbone are 12% in Japanese and 14% in English. At best, HiTr clauses only partially and indirectly reflect the plot structure of the narrative.

On the contrary, when we come to the sequentiality criterion, the correlation between HiTr and the sequentiality looks pretty strong. The total on the right side shows that 16% of the whole texts are with HiTr and sequential. The percentage of the clauses with HiTr but not sequential at first appears problematic, because it is 7% in Japanese and 11% in English. But if we recognize that most of them are in fact within the *quoted speech* in the story, and subtract them from the figure, the distribution becomes very convincing, i.e. 16% versus 1% in both Japanese and English. This is in accord with the recent studies in discourse analysis, e.g. Thompson (1987: 436): "..it has become clear that the temporal ordering criterion and the 'important event' criterion need to be sharply distinguished".

Then, the question goes, what is it that lets the speaker construct the plot structure from the discourse, given that the primary function of HiTr is to encode the sequentiality? This is no doubt among the toughest problems in discourse analysis. What is in order is to study the clauses that express less dynamic change of state but are equally relevant to the plot structure. They may include "staging information", e.g. the entrance and exit of entities, as well as the speech acts, both direct and indirect, performed by the participants in the narrative: promises, interdictions, requests, and so on. Such information is not usually encoded with HiTr, but it is certainly an integral part of the plot.

A general framework for comprehending the situation is, however provisional, shown in the figure (4):

(4) Domains of event-coding:
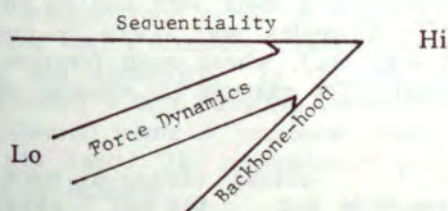
Prototypically, the events involving high force dynamics (in the sense of Talmy 1987) are encoded with HiTr. They are clearly sequential and highly relevant to the plot structure (as in the clause no.11 of the first text, cf. (3)), because narrative discourse essentially consists of the actions--presumably kinetic and concrete--that bring

about changes in the situation (for a similar account, cf. DeLancey 1987). Let us call this the cardinal Tr. The figure (4) shows that the closer an event is to the cardinal Tr, the more likely it is that the two criteria--backbone-hood and sequentiality--overlap. Its opposite, i.e. that the more distant an event is from the cardinal Tr, the less likely it is that the two criteria overlap, also seems to hold.

2.2 Turning to the difference in the event-coding between Japanese and English, there does not seem to be a crucial difference at the high end of Tr. That is, events involving high force dynamics are encoded with cardinal Tr in both languages with sequential ordering. However, the two languages exhibit a marked difference in the way they encode less dynamic but relevant events for the plot structure (let us call this "medium Tr", provisionally). This is very important since this type of events forms a major portion of the whole narrative.

To give the conclusion first, *Japanese seems to prefer encoding the equivalent events with lower Tr than English outside the cardinal region of HiTr*. And this difference is systematic across various Tr parameters, ranging from argument structure, aspect, affectedness of object, etc. Below we shall be watching the different figures of discourse in Japanese and English.

First of all, the "staging information" that I mentioned above tends to be encoded with lower Tr in Japanese than in English, consistently. And the modulation of discourse flow is accomplished by different means, for example the concatenation of *versatile verbs* in the sense of Matisoff (1973), i.e. basically a closed set of verbs which may function both as a main verb and as an augmentative, quasi-auxiliary verb. Examples are: *-kuru* 'to come', *-naru* 'to become', *-miru* 'to see', etc.), whose main function is to modify viewpoint and Aktionsart. The example (5) contains *-ki(-te)* (citation form *kuru*): [2]

(5) ciisana tai-ga   ookina sakana-ni **owa-rete-kite**
    small   sea_bream-NOM big   fish-DAT   **chase-PASS-come**
    'a small sea bream **came being** chased by a big fish'
    =>**he saw** a little sea bream that had been chased by a bigger
    fish (#1)

Here, in the English translation, the entrance of the sea bream into the narrative scene is encoded by the verb *see*, with explicit

involvement of the human subject (experiencer/perceptor). But the original Japanese only implicitly assumes the presence of the human subject by using *-kite* 'to come (into the scene)'--this is far from canonical Tr but is still important for the narrative structure (cf. "Encounter with donor" in Propp's framework). In other words, a new entity is introduced with reference to the human subject in English, while it is done with reference to the whole situation in Japanese. Similar examples are:

(6) hosii mono-ga nandemo **deru**   kozuci-da-yo
   want   thing-NOM whatever   **come_out** hammer-PRED-PRT
   '(this) is the hammer (from which) whatever you want **comes out**'
   =>(you can strike with the hammer and) you will get it (#3)

(7) oya kame-ga **de-ta-ya**
   oh   jar-NOM   come_out-PAST-PRT(=interjection)
   'oh, (here) came out a jar!'
   => ah, I've found out a jar (#2)

(8) ciisana cuci-ga   hitocu **ocite-i-masi-ta**
   small   hammer-NOM one   **fall-STATIVE-POL-PAST**
   'a small hammer (had) laid (on the ground)'
   =>they saw a little hammer that had been dropped (#3)

Examples (7) and (8) are the same cases (cf. "Acquisition of the magical agent" in Propp's terms). Here too the introduction of new entities into the stage is done by transitive verbs of perception in English, and by the control of viewpoint in Japanese. In (7), Japanese uses *de(-ta)* (citation form *deru*), 'to come out, appear', while English uses *I've found out*, a transitive construction, and thus evokes higher volitionality and agentivity. In (8), the mere stative, existential content is encoded with a transitive construction in English. Example (6) is even clearer: *whatever you want comes out* vs. *you will get it* (=whatever you want). The realization of goal is far more explicit in English than in Japanese.

As may be predicted by TrHy, such a choice of Tr feature triggers the co-variance of other Tr features, and this I consider amounts to the difference in the texture of each language.

But here I may haste to add that these are not the only possible patterns in Japanese and English. The point is, they prefer such patterns for the discourse function of relevant staging, while

they could have done differently if the discourse function had been different (there are examples of simple existential constructions in English, and there are clauses lacking versatile verbs in Japanese).

Next, example (9) is a case of impersonal construction:

(9) kuwa-no saki-ga kacin-to isi-ni-demo bucukatta **oto-ga** sita
    hoe-GEN   tip-NOM (onm.tp) stone-DAT-PRT hit **sound-NOM**   did
    '(it) **sounded** "kacin" (like) (his) hoe's tip hit a stone'
    =>his hoe **made a** clanging **sound** as though it had hit a stone
(#2)

In the above example, somehow remarkably, English prefers transitive, or causative pattern, and by imposing the semantic structure associated with this construction, it enhances the saliency of this event (e.g. it makes a non-kinetic event look like a kinetic action). Example (10) is more like a problem of idiomaticity, but the same tendency is observed. It is not unreasonable to suspect that the preference a language makes manifests itself in its idioms:

(10) hebi-wa sukkari **genki-zuite**
    snake-TOP completely **become_lively**
    '(the) snake **become** completely **lively**'
    =>the snake completely **regained its strength** (#1)

Here, *genki-zui(te)* 'to become lively, or active' vs. *regain strength* is the issue at stake. It appears that aspect and punctuality are also different between these languages. Again Japanese sentence is less telic, less punctual, due to the inherently inchoative nature of the verb *-zuite* (the grammaticization of this verb is interesting: as a lexical verb it means 'to reach', but as a versatile verb it means not 'to reach a completion', but 'to reach a threshold').

An indirect diagnostics for checking the difference of aspect would be like this: given that the Tr parameters co-vary, the affectedness of O, i.e. regaining of strength, should be greater in English. Then, let us remove the adverb of completion *sukkari* and *completely* from (10), and say, (10') *hebi-wa genki-zuita-ga, mada ugoke-nakatta*, vs. (10")*the snake regained its strength, but it couldn't move yet.* I suspect this English expression sounds a little odd (though Japanese doesn't indeed), since the telicity of the verb is not easily defeasible in the second clause. How should it be improved, then? One possibility would be: *the snake regained some*

of its strength, but it couldn't move yet. For (10") to be defeasible, the telicity of aspect should be neutralized with *some*, rendering the regaining of strength partial and hence less telic.

Example (11) is a rather simple and clear case:

(11) aredake   namae-no sireta   oisya-ga **acumatte-ite**
 such   name-GEN known   doctor-NOM **gather-STATIVE**
 'such famous doctors **have gathered**'
 =>**they have called** all the famous doctors there are (#1)

Although the event is the same, Japanese sentence only tells the current state without reference to its cause, while English free translation expresses it with a transitive/causative construction. Here again Japanese encodes the event in terms of the whole circumstance with stative expression. The English expression is more active, and, by implicatino, purposive.

Example (12) is similar to (10), i.e. there is a difference of aspect and punctuality:

(12) oni-ga   ohimesama-wo **cukamae-you-to**   sita-node..
 ogre-NOM princess-ACC   **seize-VOLITIONAL-PRT** did-and_so
 the ogre **tried to seize** the princess, and so..'
 =>they **were just about to seize** the girl (#3)

The Japanese auxiliary of volitional *-you* apparently does not mean telic aspect, viz. the completeness of action. It is rather closer to the inchoative aspect. But the English translation uses *be about to*, which is more explicitly oriented towards the goal. The defeasibility test that we used in (10) also works: (12') *oni-ga   ohimesama-wo cukamae-you-to sita-ga, tocyuu-de akirameta* is OK in Japanese, but its English counterpart, (12") *they were just about to seize the girl, but they gave up in the   halfway*, sounds slightly odd. Japanese *tocyuude* ('in the halfway') fits this context without causing such an oddity.

Now all these differences lead to the postulation of the general typological tendency in Japanese and English. The difference we have looked at so far is, namely, the difference in the *preferred realization pattern*. The idea is that languages have different preferences of the morpho-syntactic means with which they encode the equivalent events (in the present case, narrative events), and this difference becomes more discernible when it deviates from the

cardinal HiTr events. It is quite important to note that these differences are by no means an accidental nor a trivial phenomenon. Put in another way, *languages differ in their cutoff-points (or threshold) of the Tr continuum as they differ in the cutoff points of, say, color spectrum.* [3] This idea may be intuitively captured by modifying the figure (4):

(4') Preferred domains of event-coding:
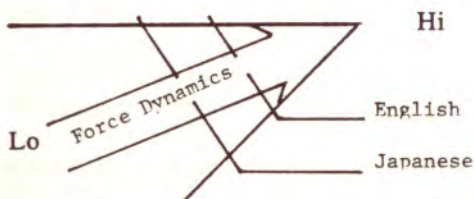
Viewed in this way, Japanese seems to have a *process-oriented* rhetoric which de-centralizes the agent and prefers lower Tr (i.e. tends to be under-transitive), and English has a *goal-oriented* rhetoric which prefers higher Tr (i.e. tends to be over-transitive) for the events involving less dynamism. This could also be related to the curious preference of English for the quasi-agentive subject.

What is potentially interesting about this is that there are possibly preferred realization patterns in the spheres of language and culture other than the sketchy account of morpho-syntax that I have given above. Now if it should turn out to be the case that languages other than Japanese and English exhibit a systematic difference in terms of preferred realization pattern, then we will have yet another way of doing typology. Since notions like goal- or process-orientedness have a fairly broad application, we may hope to look at the problems of language and culture from a new point of view. I have come to notice a handful of examples that are in accord with this typological distinction from such areas as case-marking (cf. Sugamoto 1982, and Jacobsen 1985), lexical semantics of verbs (cf. Ikegami 1981), possessive-existential continuum, metaphoric extensions, etc, but they are still premature and fragmentary, and shall be hopefully presented in the later work.

To summarize, while the claim about the cross-category harmony of grammatical features and the sequentiality of HiTr clauses are invariably valid across different languages, the encoding

of less cardinal events, i.e. those with less force dynamics, appears to be different across languages, systematically. Linguists talk about grammaticality with categorical judgments. But the problem of *preference* is no less important for understanding our object of inquiry, and I suppose the present study is in accord with the enterprise of contrastive rhetoric in the spirit of Becker (1988). TrHy, due to its grounding on discourse functions, itself may give rise to a workable typological framework when coupled with the notion of preferred realization pattern. To what extent this variation is systematic and how it is related to other domains of the linguistic structure will be our future task.

Notes

[1] Romanization basically follows Hattori (1979).

[2] Glossing conventions are as follows: (i) function words are basically in capitals; (ii) underbars are used instead of spaces where a single word in Japanese is glossed with more than one words in English (e.g. *tai=sea_bream*); (iii) abbreviations adopted are: ACC(usative), DAT(ive), GEN(itive), NOM(inative), PASS(ive), POL(ite), PRED(ication), PRT=particle, onom.tp=onomatopoeia, and TOP(ic). I did not give any specific glosses for particles.

[3] Duranti and Ochs (1988) also discuss the issue of preference (in their case that for genitive patterns in Samoan) as an important notion for characterizing individual languages.

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A Discourse-Based Analysis of Complementation in Japanese

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1. Introduction[*]

Many linguists accept complement and adjunct as two distinct categories, and assume that the valency description of a verb should specify only the complements. Generally, the complement is defined as a role that is inherently associated with a verb and syntactically and/or semantically indispensable. The adjunct, on the other hand, is characterized as an optional role that is not essential to (or not governed by) the verb.

In this paper, I examine the complement-adjunct distinction (or CAD) for Japanese verbs--a distinction made by many researchers in Japanese linguistics (e.g., Hinds 1982, Teramura 1982, Farmer 1984, Kameyama 1985, Hasegawa 1988).[1] I will demonstrate that current theories of CAD, based on the notion of semantic obligatoriness, provide insufficient support for such a distinction in Japanese.

2. CAD Tests for Japanese

For Japanese, the criterion of syntactic indispensability is void because virtually any role is subject to ellipsis. That is, utterances like *Tabeta* 'Ate' are perfectly acceptable in context. There is no morphological distinction like the use of an inflectional morpheme for a complement and that of a postposition for an adjunct: All noun phrases take postpositions regardless of role.[2] Accordingly, the criteria proposed for CAD are primarily semantic.

There have been three kinds of CAD tests suggested for Japanese: 1. the *do-so* test (Somers 1984), 2. the referability test (Kameyama 1985), and 3. the question-pull test (Teramura 1982, Hasegawa 1988). I summarize only the third test because the first two have already been proven unreliable (Hasegawa 1988).

Teramura (ibid: 83) states that the best method to identify complements is through presenting native speakers of Japanese sentences consisting only of a verbal,[3] assuming that there is no contextual information available for the interpretation. He predicts that such sentences will induce from the addressee questions

concerning the complements. For example, as shown in example (1), in response to the statement *Kowasita* 'Broke', one would ask the questions *Dare ga*? 'Who?' and *Nani o*? 'What?' because, Teramura explains, these two are complements and indispensable for the situation being described.[4]

(1) (Teramura's example (8c) in Chapter 2)
A: Kowasita. (lit.) Broke.
B: Dare ga? Nani o? Who? What?

Hasegawa (1988) proposes the same kind of question-pull test. In response to each test sentence, which contained only a verbal, the subject is expected to inquire about the complements first, then about the adjuncts, because complements are semantically obligatory elements. She regards time as "a clear adjunct" and treats as complements all elements queried before inquiries about time.

3. The Notion of Semantic Obligatoriness

In these studies, the notion of semantic obligatoriness is crucial for CAD. However, the question-pull test does not provide any measure for drawing a boundary between complements and adjuncts that is not arbitrary. In response to a question-pull sentence, one can ask any number of questions, including ones concerning "adjuncts." For example, to the sentence *Kowasita* 'Broke', the addressee may indeed respond with questions such as *Dare ga*? 'Who?', *Nani o*? 'What?', *Itu*? 'When?', and *Doosite*? 'Why?'. The order of these questions may suggest different degrees of importance of the items[5] for the interpretation of the statement, but it does not prove that only the agent and object are obligatory and that the others are optional. Further, in Hasegawa's test, the temporal item is used as the point of demarcation between complements and adjuncts because it is considered an adjunct by definition. Certainly, the question-pull test does not prove that the temporal item is in fact an adjunct.

4. Obligatoriness in "Neutral/Idealized" Discourse Context

Another important notion employed in the CAD theory is that of neutral or idealized discourse context. Hinds (1982:43), for example, states that every verbal has associated with it a "case frame which contains those noun phrase arguments which are obligatory in neutral

contexts." However, this statement is undermined by the undefined notion of "neutral context." Similarly, Hasegawa (1988) calls her question-pull test situation an idealized discourse situation, one in which no contextual information is assumed to be available to the addressee. However, the existence of such a context is questionable. A test like the question-pull represents an unnatural discourse that requires some plausible contextualization.

Elliptical utterances like *Kowasita* 'Broke' occur frequently in Japanese conversations, although in most cases, the addressee is able to interpret the utterance by filling in the unexpressed part (Hinds 1982, Okamoto 1985). Occasionally, however, they are used when the addressee is obviously unable to interpret them. Such a style may be utilized to create suspense in giving out information considered newsworthy.

The question-pull experiment is an attempt to simulate the use of this suspense style. But, in natural conversation, upon encountering a suspenseful elliptical utterance, one voluntarily asks questions according to one's curiosity. In the test situation, the subject of the test is required to ask questions regardless of his/her curiosity. What the subject is most likely to do in such a case is to make a plausible contextualization of the test sentence. For example, as seen in Hasegawa's (1988) examples, in response to sentence (2), the subject may ask questions such as *Itu?* 'When?' and *Doko de?* 'Where?', but not *Dare ga?* 'Who?' because the subject of the sentence can be assumed to be the speaker. But when sentence (3) is used, the subject asks *Dare ga?* 'Who?' first, and possibly other questions. This indicates that the subject tries to conceive a context in which the evidentiality of each statement is appropriate. In other words, the subject's judgment is made not on the verb itself as a lexical item, but on the (possible) use of the verbal, including the auxiliary verb(s), as a whole.

    (2) (Hasegawa's example #16)
        Netyatta.   (I/Somebody) slept.
    (3) (Hasegawa's example #17)
        Neteiru.   (Somebody) is sleeping.

In natural conversation, an elliptical utterance is inseparable from the context. For example, suppose the exchange in (4) below takes place in a situation like the following: B is A's mother, both A

and B know that B's husband is having an affair with another woman, and this matter is of immediate concern for both A and B.

(4) A: Nee, mityatta.   (lit.) Hey, saw.
     B: E, doko de?   Itu?   Oh, where? When?

In a situation like this, B is likely to be able to infer from the context the agent and object of *mityatta* 'saw'. B is also free to ask questions like those in (4). B's questions indicate that it is the place and time of the seeing that B wants to find out. These are the items, in addition to the agent and object, that are necessary for B to "complete" the meaning of A's utterance. In case B cannot infer the object, she may ask questions like the following: *Nani o*? 'What?', *Doko de*? 'Where?', and *Itu*? 'When?'. As I mentioned earlier, the order of these questions may suggest different degrees of importance of the items for the utterance meaning. But the difference in the degree does not tell us exactly where we should draw a line between obligatory and optional items. This suggests that the semantic obligatoriness of an item is contingent upon the interpretation of each utterance and cannot be determined in the abstract as an inherent lexical feature of a verb.

5. Relative Importance of Roles in the Discourse World

This discussion also assumes that the "obligatoriness" of an item is a matter of degree. That is, given an utterance, some items may be considered more needed than others, depending on the degrees of their functional importance in discourse. This importance is relative to the item's informational value. That is, it depends on whether the item is the focus of new information, or a topic of the utterance,[6] or a backgrounded item; among these three, the focus is regarded as having the highest value, and the backgrounded item(s) as having the lowest value, from the viewpoint of communicative dynamism, a notion developed by Firbas (1966).

For example, in (5),[7] among the agent, object, time, and location of the seeing in C's utterance, the first three may be considered more important at the moment than the last role, location, because they constitute the topic of C's utterance. The location is a backgrounded element and least important. However, it is not totally irrelevant: It is understood by both C and Y as the specific place where the movie was shown. Discourse comprehension, as Fillmore (1981) explains, is attained by an appropriate envisionment of the discourse world. From

this point of view, the location of seeing the movie in C's utterance cannot be said to be totally unnecessary.

(5) C: Ano sa, eega mini itta? Kinyoobi no . . sensyuu no   kin
        uh   movie see went Friday's   last week's   Fri
        'Uh, did ( ) go see the movie? Friday's . . last Fri'
    Y: [Nihon] aa, un ikimasita.
       [Japan] uh yes went
       '[Japan] uh, yes, ( ) went.'

I's first utterance in example (6) also involves the action of seeing. But in (6), Y, who is only an acquaintance of I, may not know the exact location of the seeing in question. In such a case, Y would make a default interpretation of the location as some particular place. This interpretation is required for I's utterance to be understood as a description of a specific event rather than a general description like that in example (7):

(6) I: Sore de, maa, asa, aa,   (koobo no) baiyoo-zyootai o mite
       so   well   morning   (bacteria's) condition   saw
       'So, well, this morning, uh, ( ) saw/checked the condition
       (of the bacteria)'
    Y: Hai.
       'Yes.'
    I: Sositara, maa mada tyotto   seeiku ga   warukatta kara,
       then   well still a little bit growth   bad   so
       maa mootyoi   kakaru naa to omotta n desu kedo ne.
       well a little longer take   thought   but
       'Then, the growth wasn't good, so ( ) thought ( ) will
       take a little longer.'

(7) Hosi no oozi-sama no tiesya wa yuu, "Mono-goto wa
    Little Prince's   wisdom   say   things
    kokoro de minakutya mienai   tte koto sa."
    heart with see unless see cannnot
    'The wisdom of "A Little Prince" says, 'Things, ( ) cannot
    see unless ( ) see(s) them with the heart.'

A default interpretation is also applied for the location of the seeing involved in example (7). But here it is to be understood as any nonspecific place because the utterance is a general description.

Because of this nonspecific, vague nature of the location, we may say that the location here is hardly relevant to the discourse world as compared to that in examples (5) and (6). The time of the seeing in (7) is to be interpreted in the same way as nonspecific. Furthermore, the agent of the seeing is also non-specific, that is, it can be anyone in like circumstances. We may say that for the utterance in question in (7), the object and instrument are more important than the agent, location, and time.

That the degree of "obligatoriness" of an item may change from utterance to utterance can also be seen in example (4). There, for A's utterance, the agent and object of the seeing may be considered more important than the location and time, whereas for B's utterance, the latter two are more important than the first two.

6. Referential Specificity

Examples (8) and (9) also illustrate the nonspecific and vague agent.

(8) Y: (Sono zyaketto) attakai desu ka, yappari?
    (that jacket)   warm   as one would think
    'Is (that jacket) warm, as one would think?'
  M: Un, soo nee.
    'Yes, I think so.'
  Y: Bosuton da to, koo yuu no   kinai to samui desu ka.
    Boston if it's this kind of thing wear unless cold   QUES
    'In Boston, is it cold, unless ( ) wear(s) this kind of thing?'

(9) I: Sinsya   mo kawanai hoo ga ii tte iimasu ne, dauntaun   ni
    new car also buy not better   say   downtown in
    sunde iru hito   wa.
    living   people
    '( ) say ( ) had better not buy a new car, people who
    live in downtown.'
  O: Soo, soo desyoo nee.
    'That's probably the case.'
  I: Ano, paatu o   toraretyau tte iimasu yo.
    uh, parts   get stolen   say
    'Uh, ( ) say parts get stolen.'

Like the agent of *mi-* 'see' in (7), the agent of *ki-* 'wear' in (8) is any nonspecific person. It is unlikely that with respect to these nonspecific agents, the addressee would ask a question like *Dare ga?* 'Who?'. That is, whether it is the agent, time, or location, if the interpreter is not interested in its specific identity, it can be left vague. This means that the subject of the question-pull test is not concerned with whether an item is obligatory for the verb as a lexical item, but rather whether the item's specific identity is necessary for the verbal in the (possible) discourse world.

It is to be underscored that no item (of any role) interpreted as nonspecific is totally irrelevant to the situation being described. Such a nonspecific reading is necessary for the utterance to be interpreted as a general statement. Note also that the term "nonspecific" is only a cover term, and that there are different kinds of nonspecific items. For example, the agent of the two instances of *i(-imasu)* 'say' in (9) is not anyone, but people in general who live in the area; the agent of *tor-* 'steal' is some people who steal car parts in the area. An appropriate envisionment of the discourse world must include these subtle differences.

The object of an action may also receive a default interpretation, as shown in examples (10)-(12). In these sentences, what is in focus is not the objects, but the activities themselves. The objects are understood as things typically associated with the activities, and their specific identities need not be mentioned.

(10) Undoo-sinai de <u>tabete</u> bakari iru to, hutoru wa yo.
    exercise without eat   nothing but   get fat
    'If ( ) eat all the time without exercising. ( ) will get fat.

(11) Konya   <u>nomi</u> ni ikoo ka.
    this evening drink   go QUES
    'Shall ( ) go drinking this evening?'

(12) Kinoo   wa   itiniti-zyuu <u>benkyoo-sita</u>.
    yesterday   all day   studied
    'Yesterday, ( ) studied all day.'

7. The Notion of Optional Complement

Another notion often used in the theory of CAD is that of optional/associate complement--a category set up in between complement and adjunct (Teramura 1982, Kameyama 1985). It is,

however, unclear how associate complements differ from complements and adjuncts.

(13) Ano hito   wa   <u>kekkon-site iru</u> n desu ka.
     that person   married   is   QUES
     'Is that person married?'

(14) Yamada-san ne, America-zin to   <u>kekkon-sita</u> n datte.
     Yamada   American with married   I heard
     'I heard that Yamada got married to an American.'

Teramura (1982:97), for example, treats the counterpart (NP-*o*) for the verb *kekkon-suru* 'marry' as an associate complement.[8] Compare examples (13) and (14) above. In (13), the speaker is interested in knowing whether the person is married, not to whom the person is married. Thus, the counterpart is not specified; it receives a default interpretation as someone. It is, however, marginally relevant. The status of the counterpart in (13), thus, does not seem to be different from that of the location and time of *kekkon-sita* 'married' in (14), which also receive a default interpretation as some particular place and time. Nevertheless, in the CAD theory, the counterpart for *kekkon-suru* is considered an associate complement, but the location and time for the same verb are treated as adjuncts.

Compare now examples (10) and (13). As mentioned, the object of *tabe-* 'eat' in (10) is nonspecific, just like the counterpart in (13). Yet in the CAD theory, the object of *taberu* is considered a complement, and the counterpart for *kekkon-suru* an associate complement. It remains to be explained how this judgment is made. The use of *taberu* with a specific object may be more common than the use of the verb *kekkon-suru* with a specific counterpart. But this is only a matter of relative frequency and cannot be the basis for establishing two categories complement and associate complement.

The verb *aruku* 'walk' is usually treated as an intransitive verb based on its use as in example (15). But it may also take a locative object (or path) NP-*o*, as in (16). The locative object in (15) is unspecified. It is, however, not entirely nonexistent, but receives a default non-specific interpretation, just like the objects for the verbs discussed in (10)-(12). It is thus unclear why, in the CAD theory, the locative object for *aruku* is treated as an associate complement, while the object for verbs like *taberu* 'eat' is a complement. The only difference between the two seems to be the relative frequencies with

which the objects are (non)specific. Similar examples are given in (17).

(15) Saikin kuruma o katta node, amari   <u>arukanaku</u> natta.
recently, car   bought so not so much walk not became
'Recently, ( ) bought a car, so ( ) do not walk much.'

(16) Mainiti,   ano miti o <u>aruite</u>, gakkoo ni   itta.
every day that road   walk   school to   went
'Every day, ( ) walked (through) that road and went to school.'

(17) a. Taroo ga   (ame no naka o)   <u>hasitte</u> iru.
                  (rain   in)   running
     'Taroo is running (in/through the rain).'
     b. Akatyan ga (rooka   o)   <u>hatte</u> iru
         baby   (hallway)   crawling
     'The baby is crawling (through the hallway).'
     c. Taroo-tati no hikooki wa, ima-goro, tyoodo (Arasuka
                  pl.   plane   now   just   (Alaska
         no zyookuu o) <u>tonde</u> iru hazuda.
         over sky)   flying   supposed
     'The plane that Taroo and others took is supposed to be flying (over Alaska) right now.'

There are also many verbs that may take an NP-*ni* constituent that is considered an associate complement. For example, the result (NP-*ni*) for the verbs listed in (18) below is treated as an associate complement while the original state (NP-*kara*) is considered an adjunct (Teramura 1982:121, 126). The same question remains as to the reasons for the different treatments of these two roles.

(18) *wakareru* 'part', *tizimu* 'shrink', *hueru* 'increase', *agaru* 'rise', *hatten-suru* 'develop', *kimaru* 'be decided, *ageru* 'raise', *hiyasu* 'chill'

8. Adjuncts

One of the premises in the CAD theory is that adjuncts are outside the subcategorization frame of any verb and can be added freely to any sentence. It is, however, not difficult to give examples of

"adjuncts" whose choice is affected by verb type. For example, the role instrument is usually considered an adjunct. But it is applicable only to verbs of action like *taberu* 'eat' and *iku* 'go', but not to verbs of natural process like *kusaru* 'rot/decompose', or to verbs of mental process like *kanasimu* 'be sad'. Moreover, different verbs of action require different kinds of instruments; the verb *taberu* requires a certain kind of instrument, while *iku* requires another. The role partner (or comitative role) is also usually treated as an adjunct. But it cannot appear in clauses with certain verbs of mental state like *hosii* 'want', or with verbs of uncontrollable action like *nakusu* 'lose'.

Furthermore, it follows from the preceding discussion that we need not ask the question of whether a particular role falls inside or outside the government of a verb as a lexical item. A more apt question would be whether a particular role can be a potential constituent of situations that contain the action (or process or state) denoted by a verbal. And, whether a particular role is actually needed or not must be determined situation by situation. Thus, even time and location, which are commonly treated as adjuncts, may not be added freely to any sentence when they are not relevant to the situation being described (e.g., (20) below).

9. Interpretation of Fragmental Utterances

The foregoing discussion of CAD also implies that it is inappropriate to regard ellipsis in Japanese as a surface structure phenomenon. Hinds (1982: 36) characterizes ellipsis as a structural slot to be filled from elsewhere. He states that the reason one feels something is left out of example (19) (example (4b) in Hinds ibid: 21) is that one compares this surface structure with the surface case frame pattern of the verb *yomu* 'read', i.e., [NP-*ga* NP-*o*], and realizes that NP-*ga* and NP-*o* should be specified (Hinds ibid: 21). That is, this obligatory case frame provides a signal to the addressee to search for these missing elements (Hinds ibid: 31). A similar structural approach using the concept of PAS (predicate argument structure) is seen in both Kameyama 1985 and Hasegawa 1988.

(19) (Hinds' example 4b in Chapter 1)
   Yomitagatte-iru.
   (Someone) shows a sign of wanting to read (something).

This structural approach to ellipsis presupposes CAD and the static valencies of Japanese verbs. However, as discussed previously, the "obligatoriness" of an item varies depending on the discourse, and an item is considered missing if and only if the interpreter thinks it is necessary for an appropriate envisionment of the discourse world. Whether it is a "complement" or an "adjunct," it may or may not need to be specified, depending on the context. For example, the agent, object, time, and location of writing in (20) are equally nonspecific. Thus, what makes one search for a missing item is not the obligatory surface case frame of a verb itself; such surface obligatoriness cannot be justified, especially in the light of the fact that Japanese allows ellipsis for virtually any role. Rather, what controls the interpretation is one's desire to make sense in a given context--i.e., one's judgment about the semantic/pragmatic, not the surface structural, "completeness."

(20) Kono pen wa, totemo kaki-yasui.
this pen   very   write easy
'This pen is very easy to write with.'

To simply follow the obligatory case frame (or PAS) of the verb in interpreting an elliptical utterance does not take us too far in the envisionment of the discourse world because such a frame is restricted to "complement" and does not say anything about "adjuncts" in the cases where these are considered to be missing from the surface. A common solution to this problem about missing "adjuncts" is to resort to some kind of pragmatic interpretation, that is, to recognize two levels of interpretation for elliptical utterances--the structural level for "complements" and the pragmatic level for "adjuncts" (e.g., Hinds 1982). However, the foregoing discussion demonstrates that such a two-level treatment is not justifiable.

Note that I am not denying the existence of native speakers' knowledge of the valency of a verbal in a broader sense--i.e., all, and probably a large number of, semantic roles potentially associated with a verbal in discourse. Nor do I disagree that native speakers use this knowledge in interpreting fragmental utterances because it provides certain roles as candidates for the missing item. What I am questioning is the narrowly defined sense of valency--the notion of static case frame of a verb as a lexical item, based on CAD.

10. Conclusion

This paper has demonstrated that the number and kinds of semantically obligatory roles cannot be determined in the abstract as an inherent lexical feature of a verb. Because they depend on the verb's actual use, the number and kinds of obligatory roles vary according to the functional importance and referential specificity of the roles in each concrete discourse world with which the verb is associated.

This view agrees with Rice's (1988) argument that the "lexical item" is not a natural unit of linguistic organization but is a constituent of a semantic network. Hopper and Thompson (1980) claim that transitivity should be treated as a discourse notion rather than a lexical feature--as a property of a clause determined by various semantic, syntactic, and pragmatic parameters. My paper supports the application of this view of dynamic transitivity to Japanese verbs.

The conventional static valency description which stipulates only the "complements" may be useful for a broad classification of Japanese verbs, but the present paper suggests that such a limited valency be regarded, not as a representation of the obligatory roles for a verb, but as an abbreviation for the many roles potentially associated with a verb.

Notes

* I wish to thank Paul Hopper, Randy LaPolla, Yoshiko Matsumoto, P. J. Mistry, Sandra Thompson, Linda Thornburg, Graham Thurgood, and Ray Weitzman for their comments on an earlier version of this paper.
1. Although there are terminological differences, these studies all accept the CAD.
2. No other morphosyntactic evidence for CAD seems to exist, either. See Okamoto (1988) for details on this point.
3. The term "verbal" refers to a verb/adjective/noun marked by modality (i.e., tense, evidentiality).
4. Although I do not agree with Teramura's use of the notions complement and adjunct, I have greatly benefited from his detailed and sentitive description of Japanese verbs.
5. I use the term "item" to refer to an entity that has a certain semantic role.
6. Following Lambrecht (1987), I take the notion of topic and focus as relational concepts rather than referential concepts.

7. Examples (5), (6), (8), and (9) are taken from tape-recorded conversations. Example (7) is an excerpt from a newspaper article. I constructed other examples.
8. The term used by Teramura for associate complement is *zyun-hissu-hogo*.

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On Anaphoric Islands and Peninsulas[1]

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1. One of the most interesting problems of language analysis is the functioning of anaphoric relations. The statement that "the interpretation of some element in the discourse is dependent on that of another [and] the one presupposes the other, in the sense that it cannot be effectively decoded except by recourse to it" (Halliday & Hasan 1976:4) is particularly important. In this view, anaphora is "simply the presupposition of something that has gone before, whether in the preceding sentence or not" (Halliday & Hasan 1976:14). One major issue that is involved in this approach to anaphora is connected with the processes of textual and conversational aspects of language. Many factors of anaphora functioning that are difficult to formulate clearly and explicitly are restricted by communication processes.

Yet there is a formal element involved, and it would be a mistake not to separate the syntactic conditions from the pragmatic in the study of anaphoric relations between a given antecedent and its anaphoric expression. But even when we analyse the formal account of some of the restrictions on anaphora, the question remains: what formal characteristics are relevant?

The description of anaphoric relations has to account for a number of problems concerning certain irregularities between the antecedent and its anaphoric pronoun. I shall analyse these irregularities in terms of coherence and cohesion. This is a result of the theoretical assumption that coherence "concerns the ways in which the components of the textual world, i.e. the configuration of concepts and relations which underlie the surface text, are mutually accessible and relevant" (de Beaugrande and Dressler, 1981:4), and cohesion "concerns the ways in which the components of the surface text, i.e. the actual words we hear or see, are mutually connected within a sequence" (de Beaugrande and Dressler, 1981:3). The textual world/surface text dichotomy leads to an interesting presentation of anaphora. It points to conversational aspects of anaphora on the one hand, and grammatical aspects of anaphora on the other. Szwedek

(1980:97) observes that "in such a case the deep structure of a text would be equivalent to a full explication (description) of the discourse (of which the text would be only an incomplete written record)". Thus, the question is under what conditions the limits of "the distance between cohesive elements in terms of degree (depth) of embedding" (Szwedek, 1980:98) are established. In view of such an approach, the analysis of anaphoric relations should be based on considering a number of presuppositions in order to find the points of cohesion.

Let us assume that to use a given lexical item successfully, one has to define its presuppositions, or in other words "happiness conditions", i.e. "the conditions which must be satisfied in order for the item to be used 'aptly'" (Fillmore, 1971:370). Kempson (1975:63) observes that "in the case of a lexical item its presuppositions are said to be those elements of its meaning which are unaffected by negation, i.e. they cannot be denied".

In the familiar example "That person is a bachelor", Fillmore (1971:382) points out that "the negation-test reveals that only the property of 'having never been married' is part of the meaning proper". Uses of this word presuppose that the entities being described are human, male, adult. It is stated that "the sentence: That person is not a bachelor' is only used as a claim that the person is or has been married, never as a claim that the person is a female or a child" (Fillmore, 1971:382). In other words, uttering the sentence 'That person is a bachelor' we presuppose that 'the person isn't married', i.e. 'he hasn't got a wife'. Consider the following pairs of sentences:

- (1) a. John hasn't got a wife and he is unhappy without her.[2]
     b. *John is a bachelor and he is unhappy without her.[3]
- (2) a. Joan's husband is dead because I shot him.
     b. *Joan is a widow because I shot him.

The contrast between sentences (a) and (b) is formed by paraphrasing the first clause in such a way that that antecedents are no longer negated on the surface. Let me suggest then, that if part of the meaning proper of a given antecedent negates the existence of somebody, a pronoun cannot refer to it. There seems to be a lack of cohesion between the presupposition of a given antecedent and the referent of a given pronoun.

In view of this observation, I would like to discuss the articles by Postal (1969) "Anaphoric islands" and Corum (1973) "Anaphoric peninsulas"; the former in order to analyse the constraints on anaphoric islands, the latter with a view to defining how anaphoric peninsulas function. Working with the assumption that anaphoric peninsulas exist, I shall analyse their interpretation in terms of presuppositions.

2. Postal (1969) states that some anaphoric relations can be blocked because "certain types of linguistic form become [...] anaphoric islands, where such an entity is a sentence part which cannot contain an anaphoric element whose antecedent lies outside of the part in question and which cannot contain the antecedent structure for anaphoric elements lying outside" (Postal, 1969:205).

In connection with these observations, let us concentrate for a while on the following sentences (Postal, 1969:205):

(3) a. Max's parents are dead and he deeply misses them.
(4) a. My mother's sister wanted her to live here.
(5) a. The girl with blonde hair got it caught in the fan.

By paraphrasing the sentences and making the assumption that:

- person whose parents are dead - orphan
- mother's sister - aunt
- person with blonde hair - a blonde

we get sentences with blocked anaphoric relations:

(3) b. *Max is an orphan and he deeply misses them.
(4) b. *My aunt wanted her to live here.
(5) b. *The blonde got it caught in the fan.

Structures like these testify that certain constructions blocking anaphoric relations have to be specified. I would like to suggest that sentences (3-5), as well as sentences:

(1) a. John hasn't got a wife and he is unhappy without her.
   b. *John is a bachelor and he is unhappy without her.
(2) a. Joan's husband is dead because I shot him.
   b. *Joan is a widow because I shot him.

represent two different cases from the point of view of the constraints to be imposed on them. I would like to generalize these constraints in such a way that other forms of anaphoric irregularities can be accounted for.

In Postal (1969) there are a number of constraints on anaphoric elements which "involve the notion of identity with some other portion of sentential structure" (Postal, 1969:205). In particular, it is assumed that lexical items are anaphoric islands with respect to anaphora involving coreferential pronouns.

I would like to suggest that an adequate account of the nature of anaphoric islands has to provide some basis for the fact that if part of the meaning proper of a given antecedent negates the existence of somebody, a pronoun cannot refer to it. Thus, the formation of anaphoric islands can be restricted as specified in (6).

Lexical items are anaphoric islands with respect to the negation test of anaphora involving coreferential pronouns. This constraint has been formed on the basis of Postal's (1969) restrictions, and it is assumed to account for anaphoric relations which are blocked because identity of sense does not involve identity of all those referents which are part of the sense (cf. Postal, 1969:209). With respect to (6), let us contextualize the sentence in (2a) with (7).

(7) Mary's husband used to torture me.
(2b) Now Mary is a widow, because I shot him.

Let us assume that the addressee knows the story, so the sentence in (7) is redundant. In other words, the addressee is able to interpret the utterance in (2b) by filling in the information in (7). In this sense the information conveyed by (7) is the shared presupposition of the speaker and his addressee. Thus, S_7 is a presupposition of S_{2b}. This is possible because "for the deep structure of a Text T

(8) $T_{deep} = S_1 - S_2 - S_3 - S_4 - S_5 - S_6 - S_7 - S_8 - S_9$

we could have a rule saying that if the sequence T satisfies certain conditions, then

(9) $S_1 - S_2 - S_3 - S_4 - S_5 - S_6 - S_7 - S_8 - S_9 \dashrightarrow S_1 - S_5 - S_9$

in which case S2, S3, S4 are taken as presuppositions to S5 and S6, S7, S8 as presuppositions to S9" (Szwedek, 1980:97).

This presentation of sentences (in (9) above) points to the fact that throughout the text some information is introduced by presuppositions. Our analysis of examples (7, 2b) also refers to this feature of text continuity. Let us assume, then, that (9) has to be accounted for in order to restrict the formation of anaphoric islands. The analysis of sentences (10-11) supports this view.

> (10) a. My mother's sister wanted her to live here.
> b. *My aunt wanted her to live here.
> (11) a. The girl with blonde hair got it caught in the fan.
> b. *The blonde got it caught in the fan.

The point is that in (10b) 'aunt' and 'her' cannot have the same index, and the pronoun cannot be coindexed to the part of the coreferential index of 'my mother's sister' because this expression does not appear on the surface. Postal (1969:207) states that "the analogous situation can be seen with other lexical kinship terms, uncle, cousin, niece, nephew, etc". Consequently, we can treat them as presenting a common problem.

Sentence (11b) exemplifies the same problem. On the surface the potentially anaphoric pronoun 'it' cannot be coindexed with the lexical item 'blonde'. Coreference between those two elements is not possible unless we specify the context saying, for example, the sentence 'Look at Mary's blonde hair' that should precede (9b).

It is reasonable to suppose that whatever constraints are imposed on anaphoric processes, they should accommodate the theory of presuppositions. It is relevant to anaphoric processes to consider potential and actual presuppositions, as "the potential presuppositions of a compound sentence are (roughly) those of its constituents; and the actual presuppositions of an utterance are those that survive the process of cancellation involved in context incrementation" (Soames, 1982:58). To stress the importance of potential presuppositions for the present analysis of anaphora, it has been pointed out that some of them can be suspended without being cancelled. This characterization of presuppositions implies some constraints on anaphoric relations.

Let us assume that if anaphoric relations are blocked then the pronouns cannot refer to the suspended presuppositions of 'mother's

sister' and 'the girl with blonde hair'. In view of this observation, it appears that Postal's constraints can be reduced to something like the generalization in (12).

> (12) Lexical items are anaphoric islands with respect to
>   suspended presuppositions of anaphora involving
>   coreferential pronouns.

This constraint completes our explanation of why presuppositional conditions are so important in defining anaphora formation. In the following section, it will be suggested that, unlike Postal's constraints, (12) can predict other forms of anaphoric irregularities.

3. What is at issue in the present section is the status of anaphoric relations in the following sentences (from Postal, 1969:214):

> (13) When two Australians entered the room, Max claimed it
>   was a rotten country.
> (14) Harry is a New Yorker, but I wouldn't want to open a store
>   there.

Postal (1969) claims that these sentences exemplify anaphoric islands. Watt (1973), on the other hand, argues that sentence (13) can be compared with sentence (15):

> (15) When two Australians entered the room, Max claimed it
>   was the last place on earth he would like to live in. (Watt
>   1973:464)

He suggests that this sentence should be analysed in terms of penetrable reefs, because "as some antecedents are more penetrable so are some anaphors more penetrating" (Watt, 1973:464). Thus, penetrable reefs are defined as relations that should be anaphoric islands but that, in most idiolects, are acceptable. Corum (1973) has proposed the term anaphoric peninsulas to refer to this form of anaphoric irregularities. Specifying anaphoric relations in sentences (16 - 18),

> (16) John became a guitarist because he thought it was a
>   beautiful instrument.

(17) Shakespeare imitators usually fail to capture his style.

(18) Childhood should be time they'll remember.

Corum (1973) does not present any constraints on their formation. The theoretical framework is based on "the rule of pronominalization that links the anaphoric pronoun to a 'part' of the meaning of the antecedent [taking] place pre-lexically, i.e. before the rule lexicalization [incorporating] the 'parts' of the meaning into the lexical item that appears on the surface" (Corum, 1973:90). Corum does not analyse pre-lexical syntactic restrictions, but morphological similarities.

It has to be pointed out that though anaphoric peninsulas offer a more complicated example of anaphora, the solution to the problems posed by them is to define this type of anaphoric relations on the basis of the role assigned to "a full explication (description) of the discourse (of which the text would be only an incomplete written record)" (Szwedek, 1980:97). In view of what has been said, it appears that de Beaugrande and Dressler (1981:6) are right pointing out that "a text does not make sense by itself, but rather by the interpretation of text-presented knowledge with people's stored knowledge of the world". Given this view, I would like to suggest that the constraints on anaphoric peninsulas are subject to condition (19).

(19) Anaphora is possible if **anaphoric pronouns** are coindexed to their antecedents in **the context that** sanctions anaphoric peninsulas.

4. By the way of conclusion, I would like to emphasize the following points.

(i) Lexical items are anaphoric islands with respect to suspended presuppositions of anaphora involving coreferential pronouns.

(ii) The conflicting approaches to anaphoric peninsulas are based on the fact that the meaning conveyed by a given pronoun accounts for a full description of the discourse.

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[1]The present form of this article has benefited from discussions with Shigeko Okamoto, Vida Samiian, and Graham Thurgood.

[2]One unrelated objection to these sentences might be that they are ungrammatical due to the inappropriate definiteness of the pronoun her. However, if the indefinite pronoun one is substituted for her, the point of the sentences remains.

    (1) a. John hasn't got a wife and he is unhappy without one.
       b. *John is a bachelor and he is unhappy without one.

[3]I mark sentences (1b - 5b) as ungrammatical following Postal's (1968) analysis. In the later part of my presentation the asterisks disappear due to the proposed analysis.

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SPANISH IMPERSONAL <u>SE</u> REVISITED
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In this paper I will improve upon previous treatments of what are generally referred to as "impersonal <u>se</u>" sentences in Spanish. A typical paradigm, taken from Westphal (1980), is given in (1):

1. (a). (A-type)   Se abrieron   las puertas.
                    <u>se</u> opened-3pl. the doors
   (b). (B-type)   Se abrió   las puertas.
                    <u>se</u> opened-3sg. the doors
   (c). (C-type)   Las puertas se abrieron.
                    the doors <u>se</u> opened-3pl
   (d). (D-type)   *Las puertas se abrió.
                    the doors <u>se</u> opened-3sg.

The sentences in (1) differ in the relative positions of the verb and the plural NP, as well as in the apparent presence or absence of "plural agreement" on the verb. A-type sentences have the NP postverbally and the verb exhibits plural agreement; B-type sentences also have a postverbal NP, but the verb is singular; C-type sentences have the NP preceding a verb which exhibits plural agreement the ungrammaticality of D-type sentences shows that a verb must agree with a preverbal plural NP in this construction.

Traditional grammarians have often distinguished between A-type sentences (sometimes referred to as "passive reflexives", "impersonal passives" or "passive <u>se</u>"), and B-type sentences (sometimes referred to as "impersonal actives", "impersonal <u>se</u>", or "indefinite <u>se</u>") Some have also considered C-type sentences to be a distinct type (referring to them as "intransitive <u>se</u>" sentences). These various sorts of Spanish "impersonal <u>se</u>" sentences have also, for good reason, traditionally been distinguished as a class from reflexive and reciprocal <u>se</u> sentences, since these latter types have first- and second-person counterparts. (The reflexive and reciprocal uses of <u>se</u> are outside the scope of discussion, as is the so-called "spurious <u>se</u>" usage, where <u>se</u> is an allomorph of the 3sg. dative clitic <u>le</u>.)

Current generative treatments of the facts in (1) (e.g. Jaeggli (1986), Otero (1986), etc.) typically assume that A-type sentences are derived from the same D-structure as C-type sentences through Move-α (following analyses of Italian impersonals by Chomsky (1981, 1982), Belletti (1982), Burzio (1986), and

others). However, data and analysis of Spanish se constructions presented by Westphal (1980) suggest that Spanish impersonals, when examined in detail, differ in significant respects from their Italian counterparts (or at least from the way Italian si sentences are generally assumed to be). This being the case, the traditional Government-Binding approach to Italian si constructions will not extend to Spanish se without significant revision.

This paper motivates a more satisfactory account of Spanish impersonal se constructions, an account which is consistent with Westphal's major observations (and therefore assumes that A- and C-type sentences differ at D-structure as well as at S-structure). My account also improves upon Westphal's analysis in not relying on a rather counter-intuitive rule of optional object-verb agreement. I maintain that tensed verbs in Spanish always agree in number with their subjects and only with their subjects. This proposal will also be seen to be more in the spirit of current assumptions about the nature of thematic structure and the form and function of lexical rules.

As Westphal (1980) amply demonstrates, there are several ways in which A- and B-type sentences with postverbal NPs differ from C-type sentences with preverbal NPs:

First, while both A-type and C-type sentences are ambiguous, each having the same two possible interpretations, the "most likely, natural and normal interpretation" of each type differs, according to all of Westphal's informants. The preferred interpretation of each is the one given in boldface below:

2. (a). Se difundieron las noticias.   (A-type)
        se spread-3pl. the news
        "Somebody spread the news."
        "The news spread."
   (b). Las noticias se difundieron.   (C-type)
        the news   se spread-3pl.
        "The news spread."
        "Somebody spread the news."

In other words, A-type sentences translate into English roughly as transitive verbs with impersonal subjects while C-type sentences translate into English more-or-less as "unaccusative" (see Perlmutter (1979), etc.) or "ergative" (see Keyser and Roeper (1984)) intransitives. Thus for Westphal's informants, the following sentence, conjoining a negated A-type sentence and an affirmative C-type sentence, is not

self-contradictory and has the meaning indicated:

3. No se difundieron las noticias, pero las noticias
   no <u>se</u> spread-3pl. the news   but   the news
   "Nobody spread the news,   but   the news

                           se difundieron.
                           <u>se</u> spread-3pl.
                           spread."

On the other hand, Westphal shows that the parallel
conjunction of an affirmative A-type sentence with a
negative B-type sentence is interpreted as a
contradiction, showing that semantically, A- and B-
type sentences pattern together:

4.#No se difundieron las noticias, pero
   no <u>se</u> spread-3pl. the news   but
   "Nobody spread the news,   but

                           se difundió   las noticias.
                           <u>se</u> spread-3sg.   the news
                           somebody spread the news."

    Second, Westphal shows that A- and B-type
sentences also differ from C-type sentences in their
respective compatibility with "agent-oriented" adverbs
such as <u>deliberadamente</u> (= "deliberately"). The
examples in (5) show that while A- and B-type
sentences can appear with such adverbs, C-type
sentences cannot:

5.(a). Deliberadamente se rompieron las ventanas.
       deliberately   <u>se</u> broke-3pl. the windows
  (b). Deliberadamente se rompió   las ventanas.
       deliberately   <u>se</u> broke-3sg. the windows
  (c).*Las ventanas deliberadamente se rompieron.
       the windows deliberately   <u>se</u> broke-3pl.
  (d).*Los jóvenes se seducían deliberadamente.
       the youths <u>se</u> seduced deliberately

Sentence (5d) (taken from Strozer (1976)), is also
C-type, and is included to show that the
ungrammaticality of (5c) is not merely due to some
constraint against too many preverbal phrasal
constituents (Groos and Bok-Bennema (1986)).
    Third, and contrastively, it is only C-type
sentences, but not A- and B-type sentences which allow
"reflexive adverbials" such as <u>por sí mismos</u> (= "by
themselves" or "on their own"):

6.(a).*Se rompieron   las ventanas por sí mismas.
        <u>se</u> opened-3pl. the windows by   themselves
 (b).*Se rompió   las ventanas por sí mismas.
        <u>se</u> opened-3sg. the windows by   themselves
 (c). Las ventanas se rompieron por sí mismas.
       the windows <u>se</u> broke-3pl. by themselves

The compatibility of A- and B-type sentences with "agent-oriented" adverbs together with the rejection of <u>por</u> <u>si</u> <u>mismo</u> phrases suggests that these types allow what Keyser and Roeper (1984) refer to as "implicit agents" (although as has been observed by Fagan (1988), the implicit θ-role can be other than agent, such as experiencer with English verbs such as <u>shock</u> and <u>excite</u>). The opposite pattern shown by the C-type sentences suggests that they do not allow "implicit agents".

To summarize, the sentences in (1) have the following properties:

> A-type sentences allow implicit agents and exhibit number agreement between the verb and the following plural NP;
> B-type sentences also allow implicit agents, but exhibit "disagreement" in number between the verb and the following plural NP;
> C-type sentences do not allow implicit agents and they require number agreement between the verb and the preceding plural NP, which is why D-type sentences are ungrammatical.

Much of what has been written about Italian and Spanish impersonals has focused on the nature of the clitic <u>si</u> or <u>se</u> in terms of whether it is (or is in some sort of "chain" with) the subject, whether it absorbs the subject θ-role, absorbs Case, etc. Without committing oneself to any such position at this stage of the investigation, it seems that at the very least one could say that <u>se</u> in Spanish marks (or "licenses") (1) some change in the basic θ-structure of the verb and/or (2) some non-canonical assignment of θ-roles to syntactic arguments (Wilkins (1985)). Such operations, particularly of the first sort, are typically considered in current theory to take place in the lexicon, and have been invoked to explain such things a passivization and causitivization in various languages as well as the formation of English middles and ergatives.

The fact that A- and B-type sentences allow implicit agents suggests that no basic changes have been made in the θ-structures of their verbs. Although they are interpreted impersonally, a volitional "doer" is implicit in these sentences, an arbitrarily interpreted "logical subject." The plural agreement seen in A-type sentences suggests, as is also the case with passives, that the NP corresponding to the "logical object" of the verb is structurally the subject. What _se_ does in A-type sentences is mark or license the operation of lexical rules such as the middle formation rules proposed by Fagan (1988):

7. (a). <u>Assign arb to the external θ-role.</u> (F's #67)
   (b). <u>Externalize the direct θ-role.</u>   (F's #68)

Rule (7a), similar to a rule proposed by Rizzi (1986) to explain "null objects" in Italian, would in Spanish basically prevent the θ-role normally assigned to the (typically agent) subject of a transitive verb (like <u>abrir</u> (= "to open") in (1)) from being assigned to any definite NP. A rule like (7b) would be necessary to ensure that the remaining NP appears in subject position.

Since, as mentioned, B-type sentences allow the same arbitrarily interpreted implicit agent, the same <u>arb</u>-assignment rule must operate with them as in the A-type sentences above. The fact that there is a seeming lack of plural agreement between the verb and the following NP indicates that the NP is in fact not the subject of the sentence but rather the object (much as was suggested by Westphal for both the A-type and B-type sentences). What _se_ does in B-type sentences is mark or license the operation of lexical rules such as the following:

8. (a). <u>Assign arb to the external θ-role.</u> (F's #67)
   (b). <u>Delete the external argument.</u>

Rule (8b) allows for a simple explanation for the apparent "lack of number agreement" in B-type sentences: these sentences simply have no subject, neither an overt NP nor an empty category, for the verb to agree with, since there is no longer a subject position for an NP to appear in.

The idea that in certain languages there can be truly subjectless sentences, either through the operation of a rule such as (8b) or because of the subcategorization requirements of specific lexical items, has in fact been proposed by Leonard Babby in

recent work on Slavic languages (Babby (1988a), (1988b)). Babby, working in what is essentially a Government-Binding framework, proposes that Chomsky's "Extended Projection Principle" is parameterizable. For some languages (including English) subjects are obligatory. But there is solid evidence suggesting that for other languages (such as Ukrainian and Russian) subjects are optional. My analysis of the B-type sentences presupposes that Spanish has the "optional subject parameter" set like Ukrainian and Russian.

The fact that C-type sentences are incompatible with implicit agents suggests that the verb has one less θ-role in its lexical specification (or θ-grid) than the verb in A- and B-types. This, combined with the obligatory nature of plural agreement, indicates that what se does in C-type sentences is (1) mark (or "license") a change in the basic θ-structure of the verb and (2) force the NP to appear in subject position. Lexical rules such as those proposed by Fagan (1988) for the formation of English ergatives would account for these two facts:

9.(a). <u>Delete the external θ-role.</u>   (Fagan's #70)
  (b). <u>Externalize the direct θ-role.</u> (F's #68)

As mentioned earlier, Westphal (1980) proposes that the grammar of Spanish contains an optional rule of object-verb agreement. He tries to show that the NPs in both A- and B-type sentences are objects, and that the A-type sentences show the effects of an optional object-verb agreement rule, while in the B-type sentences the optional rule has not applied. In the latter case, Westphal invokes a convention apparently operative in other languages such as Turkish, Hindi, Georgian, Caucasian and Dravidian, which assigns the unmarked verb ending to verbs which fail to undergo agreement. For Spanish this unmarked ending is third person singular (or one might want to say "is homophonous with" or "is non-distinct from" third person singular).

I assume that Westphal's account is indeed essentially correct for the B-type sentences. As a result of the verb having undergone the lexical rules in (8), B-type sentences have no subject position. Since there can be no agreement when there is no syntactic subject, the verb, by the convention mentioned by Westphal, resorts to the "default" third person singular strategy. Lacking as it does any neuter setting for number, Spanish would in fact be

expected to exhibit either singular or plural on all tensed verbs, since number cannot be morphologically separated from the tense and mood marking required of all tensed Spanish verbs.

My disagreement with Westphal involves his treatment of the A-type sentences. Rather than concluding, as Westphal does, that the NP is in object position in the A-type sentences, my claim is that the NP in A-type sentences is in fact the subject. These cases differ from the C-type sentences in that the subject is in post-verbal position. If this is true, then the intuitively appealing claim that agreement is always with subjects in Spanish can be maintained. When there is a subject in a tensed Spanish sentence (as I am claiming there is in both A-type and C-type sentences) there is agreement with the tensed verb. When there is no subject (as I am claiming for the B-type sentences) there can be no agreement between the verb and the plural non-subject NP.

What evidence is there, other than the behavior of impersonals, that subjects are optional in Spanish? For one thing, there exist no counterparts in Spanish to the English pleonastic "it" and "there" whose sole purpose seems to be to keep the obligatory subject position from being empty at S-structure. A plausible explanation for the lack of pleonastic subjects would be that Spanish is not required to have subjects in such sentences.

Secondly, certain verbs, such as existential haber, and hacer when used in weather expressions and in certain expressions of elapsed time, typically fail to show plural agreement with plural NPs:

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10. (a). Había(*n)   tres   personas en el   cuarto.
         was-3sg.    three people    in the room
        *"There was three people in the room."
    (b). Hacía(*n)   unos calores espantosos
         makes-3sg.  some heats    horrible
        *"There was some horrible hot spells."
    (c). Hace(*n)    dos años que estudio   aquí.
         makes-3sg.  two years that study-1sg. here
         "I have been studying here for two years."
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Haber, and hacer in these functions, would appear to be Spanish verbs which are lexically specified for no syntactic subject, much as Babby has claimed for certain predicates in Russian. As with the B-type sentences, the sentences in (10) appear to be syntactically subjectless, and the third person singular "default" strategy has been invoked.

The fact that the NPs in <u>haber</u> and <u>hacer</u> sentences such as those in (10) cannot be in preverbal position is also suggestive. The paradigm is thus parallel to that of (1c & d), with the ungrammatical sentences in (11a-c) as the counterparts to (1d), repeated below as (11d):

11. (a).*Tres personas había   en el cuarto.
        three people   was-3sg. in the room
    (b).*Unos calores espantosos hacía.
        some heats   horrible   makes-3sg.
    (c).*Dos años hace   que estudio   aquí.
        two years makes-3sg. that study-1sg. here
    (d).*Las puertas se abrió.
        the doors   <u>se</u> opened-3sg.

The "subjectless sentence" analysis also provides a simple explanation for why impersonal <u>se</u> sentences are incompatible with the overt arbitrary subject <u>uno</u> ("one"), in spite of the fact that (as Westphal has mentioned) sentences with <u>uno</u> are more-or-less equivalent semantically to A- and B-type impersonal <u>se</u> sentences:

12. (a). Se abrieron   las puertas.
         <u>se</u> opened-3pl. the doors
   =(b). Se abrió   las puertas.
         <u>se</u> opened-3sg. the doors
   =(c). Uno abrió las puertas.
         One opened the doors

The above examples suggest that <u>uno</u> is an arbitrary or impersonal pronoun which we might expect to be compatible with the <u>arb</u> value assigned to the external θ-role by a rule like Fagan's (67) (presented as (7a) and (8a) above). Yet the following A- and B-type sentences are ungrammatical with <u>uno</u>:

13. (a).*Uno se abrieron   las puertas.
        one <u>se</u> opened-3pl. the doors
    (b).*Uno se abrió   las puertas.
        one <u>se</u> opened-3sg. the doors
    (c).*Uno se abrió   la puerta.
        one <u>se</u> opened-3sg. the door

The impossibility of <u>uno</u> as the subject of an A-type sentence like (13a) is due to the fact that the subject position has been filled by a definite, specific lexical NP. Nor can <u>uno</u> in such a sentence be a resumptive pronoun associated with the NP due to

various conflicts in the feature values for plurality and definiteness. And <u>uno</u> is not construable as bearing any other thematic or grammatical function in the sentence due to its lack of the "Case-marking" particle <u>a</u>.

The impossibility of <u>uno</u> as the subject of a B-type sentence like (13b) simply results from the fact that there is no subject position for it to be generated in. And the same factors which preclude <u>uno</u> from being a resumptive pronoun or some non-subject NP in A-type sentences hold equally in B-type sentences.

Sentence (13c), with a singular NP, could be either an A-type or a B-type sentence, exhibiting agreement with the singular subject NP in the former case, and employing the "default" strategy in the latter case. In either event, <u>uno</u> is disallowed, showing that it is not merely some conflict in number specification between <u>uno</u> and the NP which causes (13a) and (13b) to be ungrammatical.

To conclude, I have argued that Westphal's observations about the meaning differences between A- and C-type sentences suggests that they must be considered to arise from distinct D-structures, a position at odds with most current approaches to Spanish impersonals. I have shown that lexical rules such as those proposed by Fagan (1988) can account for most of the behavioral patterns of such impersonals noticed by Westphal, such as the distribution of "agent-oriented" adverbs and "reflexive adverbials". My approach accounts as well for the impossibility of the lexical impersonal NP <u>uno</u> to coexist with impersonal <u>se</u>. And I have shown that if one accepts as a U.G. option the possibility of truly subjectless sentences (as argued for in recent work on Slavic by Leonard Babby), it is possible to maintain the intuitively appealing position that in Spanish, subjects and <u>only</u> subjects trigger number agreement with the verb.

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Perfect Auxiliary Variation as a Function of *Aktionsart* and Transitivity
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1. Introduction. In languages with two perfect auxiliaries an important descriptive and theoretical issue concerns the principles governing the choice of HAVE vs. BE. This is of course an old question, to which at least two kinds of answers have been proposed: the auxiliary choice is determined by a) purely formal syntactic criteria, or else b) semantic criteria. While traditional analyses have largely espoused the second view, recent work has challenged this, proposing autonomous syntactic accounts. Under the so-called 'Unaccusative Hypothesis' it has been claimed that in German (Haider 1985), Dutch (Hoekstra 1984), and Italian (cf. Burzio 1986) unaccusative verbs take BE, whereas others take HAVE. Elsewhere (Shannon, to appear a,b; cf. also Fagan 1988, Zaenen 1988, Van Valin 1988) I have argued that such accounts are incorrect and shown that an alternative cognitive approach is better able to describe and explain the diachronic development of the perfect auxiliaries in Germanic and Romance, as well as the variation across these languages. The present paper extends this approach and presents further evidence in its favor from German and Dutch. Starting from prototype theory, this account crucially involves two central notions—*Aktionsart* and transitivity—and takes conceptual imagery and construal seriously. In thus taking the semantics of the clause as central, I am basically returning to the more traditional view, though taking it in new directions suggested by recent work in cognitive grammar and the theory of transitivity.

2. An Alternative Account of Perfect Auxiliary Selection. Viewed from prototype theory (cf. the literature cited in Lakoff 1987), perfect aux selection can be seen as a function of transitivity and *Aktionsart*—the traditional German term for aspect-like meanings found in the lexical/derivational realm (as opposed to aspect, which refers to an obligatory grammatical/inflectional category found e.g. in the Slavic languages). Prototypical HAVE-aux clauses are very high in transitivity, whereas BE-aux clauses are in certain specifiable ways low in transitivity, with HAVE often the default in these languages for unclear or borderline cases (e.g. statives). Hopper & Thompson (1980) propose the following ten parameters of transitivity.

	High Transitivity	Low Transitivity
PARTICIPANTS	2 or more (A & O)	1 participant
KINESIS	action	nonaction
ASPECT	telic	atelic
PUNCTUALITY	punctual	nonpunctual
VOLITIONALITY	volitional	nonvolitional
AFFIRMATION	affirmative	negative
MODE	realis	irrealis
AGENCY	A high in potency	A low in potency
AFFECTEDNESS OF O	O totally affected	O not affected
INDIVIDUATION OF O	O highly individuated	O nonindividuated

Hopper and Thompson's high transitivity relates directly to the prototypical HAVE-aux situation and certain differences in the use of HAVE vs. BE. Low transitivity, however, does not fare too well in accounting for BE-aux clauses. The reason for this is that they consider the opposite of high transitivity action situations to be **states**, whereas the prototypes for both HAVE and BE as perfect auxiliaries involve **change**, i.e. both prototypes are perfective, and states don't directly correspond to either. Nevertheless, all of their parameters, especially those dealing with change, can be shown to be relevant in perfect auxiliary selection (cf. Shannon to appear a,b).

Prototypical transitive events are encoded in the perfect with HAVE in these languages; cf. the prototype for transitive events proposed by Rice (1987) given below. Prototypical HAVE-aux clauses should then have the properties listed for high transitivity given above; in particular, they are two participant perfective actional clauses in which the subject is highly potent, the object totally affected.

Prototypical transitive events: transpire in physical space; involve two entities that are differentiated from each other, from their setting, and from the observer; involve two entities that participate in an interaction and are asymmetrically related; describe interactions in which the first participant moves toward and makes contact with the second participant; describe interactions in which the second participant is affected and reacts externally by changing state or moving.

The 'mutative prototype' on which BE-aux clauses are based is in many ways similar to the transitive prototype, except that there is no external agent but only a single participant which is affected. Thus, prototypical mutative events involve single participant, perfective predicates denoting the end point or beginning of a change which the subject (nonvolitionally) undergoes and which is not (conceived of as) brought about by another agentlike entity. This is the reason for the traditional claim that BE-aux verbs express a change of state or place.

Prototypical mutative events: transpire in physical space; involve only a single entity, differentiated from the setting and from the observer; describe an event in which the single participant is affected and changes externally by changing state or position [i.e. by moving].

In our view, perfect aux choice is thus a function of *Aktionsart* and transitivity based on these prototypes. One important difference between the two prototypes is the semantic role of the subject. They are in fact 'polar opposites' in the sense of Plank cited in Hawkins (1985) and Foley and Van Valin's (1984) Actor/Undergoer Hierarchy: the HAVE prototype has an actor subject (prototypically an agent), whereas the BE prototype takes an undergoer subject (prototypically a theme or patient). Hence the affectedness of the subject (vs. object) inter alia plays a major role in differentiating these two semantic types. As for *Aktionsart*, Dowty (1979), in perhaps the most sophisticated discussion of aspectual classes available, distinguishes: **states** (*know, believe, have, desire, love*), **activities** (*run, walk, swim, drive a car*), **accomplishments** (*paint a picture, make a chair, run a mile/to the park*), and **achievements** (*find, lose, reach, die*). Dowty proposes a number of tests to distinguish these classes; perhaps the most important of them for present purposes concerns the use of time adverbs. Perfectives (accomplishments and achievements) can be used with an adverb like 'in an hour', while imperfectives (states and activities) cannot; moreover, activities can occur with an adverb like 'for an hour'. Van Valin (1988) and Centineo (1986) have very successfully applied Dowty's framework to perfect aux selection in Italian within Role and Reference Grammar. It turns out that in German and Dutch the verbs which take BE are (intransitive) achievements and accomplishments (= perfectives); in Dowty's semantic representations, they contain the atomic predicate BECOME predicated of their subject.

However, these prototypes don't encompass all possible aspectual types; in fact, they both only relate to perfectives, so that imperfectives (states and activities) aren't covered. In German and Dutch HAVE has become the default verb which is used with states and (at least most consistently in Dutch) activities, whereas in Italian BE has been extended to cover states (cf. Centineo 1986). Moreover, the criteria are 'fuzzy' (cf. Lakoff 1987) in certain ways: specifically, the perfectivity (cf. Dowty 1979:60ff.; Langacker 1987:257ff.) or transitivity of a clause may differ or be a matter of interpretation or construal. Situations which do not fit either prototype will therefore vary according

to the interpretations given them regarding transitivity and *Aktionsart*. This is just as we would expect, given the prototype model (cf. Langacker 1987:49). Furthermore, as we will see later, one must take conceptual imagery and differences in construal seriously in order to understand perfect aux selection. Consequently, absolute predictability is usually not a realistic goal, though understanding the motivation for the aux of a given verb is (cf. Langacker 1987:39, 50f.).

3. Regularities in the synchronic distribution of the perfect auxiliary in German and Dutch: The effects of *Aktionsart* and transitivity. As I show elsewhere (Shannon to appear, in prep.), both the historical development of the perfect auxiliaries and their cross-linguistic distribution seem to follow closely the posited prototypes. The same can be shown for modern German and Dutch: in both languages verbs closely approximating the transitive prototype take HAVE, whereas clear mutatives take BE. However, the farther away from the prototypical extremes one gets, the more room for variation we find. In a number of non-prototypical cases there is room for differences of interpretation, since the criteria are 'fuzzy' and allow for varying possibilities of construal; in addition, the transitivity parameters are relevant as well.

3.1. Auxiliary Selection with verbs expressing a change of state. Beginning with inchoatives, perhaps the best examples are found when a given verb can take either HAVE or BE, but with obvious semantic differences. In both languages we find many transitive/causative (accomplishment) versus intransitive/inchoative (achievement) verb pairs such as *auftauen/ontdooien* 'to thaw', *brechen/breken* 'to break', *heilen/genezen, helen* 'to heal', etc. (cf. for Dutch Donaldson 1981:144, whence the Dutch examples below; Hoekstra 1984:213; ANS:521; for German e.g. Jørgensen 1966:32). Here the two meanings relate very closely to the opposite prototypes and therefore are found with the corresponding perfect aux; the relevant parameters are number of participants, volitionality and potency of the subject, affectedness of the object or subject (i.e. actor versus undergoer subject), and individuation of the object. Both types of verb are still perfective, however, as is seen by the appropriate adverbials. In these cases, the transitivity of the clause, not aspect, plays the decisive role in determining the perfect aux.

(1) a. *Das Huhn ist in einer Stunde aufgetaut.*

b. *De kip is in een uur ontdooit.* 'The chicken thawed out in an hour.'

c. *Ich habe das Huhn in einer Stunde aufgetaut.*

d. *Ik heb de kip in een uur ontdooit.* 'I thawed the chicken out in an hour.'

However, there are also differences in perfect aux due mainly to aspectual distinctions (activities vs. achievements in Dowty's terms). In numerous verb pairs the simplex is an activity verb and takes HAVE, whereas the derived verb, containing a perfectivizing prefix, expresses an achievement and takes BE (cf. Paul 1905:170ff.; Donaldson 1981:143, whence the following examples are adapted).

(2) a. *Das Haus hat stundenlang/*in einer Stunde gebrannt.*   'The house burned

b. *Het huis heeft urenlang/*in een uur gebrand.*   for hours/*in an hour.'

c. *Das Haus ist in einer Stunde abgebrannt.*

d. *Het huis is in een uur afgebrannt.* 'The house burned down in an hour.'

Moreover, we also find non-prefixed verbs which can take either aux, depending on the construal of their *Aktionsart*: HAVE when the duration of the event is focused on and the construal is imperfective, but BE when the completion or result is the focus and the construal is perfective. In the latter case, the view may be toward the manner or degree, not on the actual attainment of the final state. In Dowty's terms, the difference is between activity vs. achievement; in fact all these verbs appear to be of the type

Dowty (1979:88ff.) calls 'degree achievements'. Also, several of these verbs have transitive counterparts which take HAVE, as above. The group appears to be larger in German, where it includes—or at least included, since there seems to be nowadays a tendency here to always use the same aux (BE)—a number of deadjectival derivatives (cf. Paul 1905:179ff., whence (4); also Curme 1966:290). In conclusion, with verbs expressing change of state, both *Aktionsart* and transitivity play an important role in determining the appropriate perfect auxiliary with in both these languages.

(3) a. *Es hat gefroren.* b. *Het heeft gevroren.* 'There was a freeze.'

   c. *Das Wasser ist in einer Stunde zu Eis gefroren.*   'The water froze to

   d. *Het water is in een uur tot ijs gevroren.*   ice in an hour.'

(4) a. *So sehr habt ihr gealtet* [sic], *wenigstens um zehn Jahre.*
     'So much you have aged, at least ten years.'

   b. *Mein Vater ist nicht gealtert.* 'My father hasn't aged.'

3.2. The Perfect Auxiliary with verbs expressing change of position. Verbs involving motion fit into three of Dowty's categories: achievements (*ankommen/aankomen* 'to arrive'), accomplishments (*laufen/lopen* 'to run' + directional), and activities (*tanzen/dansen* 'to dance'). Achievements and accomplishments take BE, as long as they are intransitive (5; 6a, b; 7a, b), because even though the subject may act under his own power (volitionally), the view is toward his being affected in the sense of changing his position; one might speak of an active theme here. However, as with inchoatives, some accomplishments may be used in a transitive sense, in which case they of course take HAVE (6c, d; 7c, d), since they then conform to the transitive prototype.

(5) a. *Der Zug ist (*stundenlang) angekommen.*

   b. *De trein is (*urenlang) aangekomen.* 'The train arrived (*for hours).'

(6) a. *Ich bin in einer dreiviertel Stunde nach Utrecht gefahren.*   'I drove to Utrecht

   b. *Ik ben in drie kwartier naar Utrecht gereden.*   in three quarters of an hour.'

   c. *Ich habe den Wagen (*stundenlang) zur Garage gefahren.*   'I drove the car to

   d. *Ik heb de auto (*urenlang) naar de garage gereden.*   the garage (*for hours).'

(7) a. *Ich bin in einer Stunde nach Hause gelaufen.*

   b. *Ik ben in een uur naar huis gelopen.* 'I ran home in an hour.'

   c. *Ich habe mich in kurzer Zeit außer Atem gelaufen.*   'I ran myself out of

   d. *Ik heb me binnen korte tijd buiten adem gelopen.*   breath in a short time.'

However, activity verbs involving motion act rather differently. In both languages at least some such verbs apparently can be construed either as achievements (BE) when the change of position (telic use) is in the foreground (9), or as simple activities (HAVE when the activity itself (duration, manner, etc.) is focussed on (8).

(8) a. *Ich habe stundenlang getanzt/geschwommen/gerudert.* 'I danced/swam/rowed

   b. *Ik heb urenlang gedanst/gezwommen/geroeid.*   for hours.'

(9) a. *Ich bin in kurzer Zeit zur anderen Seite getanzt/geschwommen/gerudert.*

   b. *Ik ben binnen korte tijd naar de overkant gedanst/gezwommen/geroeid.*
     'I danced/swam/rowed to the other side in a short time.'

Note, however, that the tendency to interpret even common motional verbs like 'to run, ride, fly, travel' as either activities or achievements is much less pronounced in German than in Dutch (and Italian; cf. Centineo 1986), where it is quite consistent (10a vs. b). German tends to use BE with common verbs of motion regardless of the telicity of the

clause (cf. Jørgensen 1966:33), even in completely atelic senses denoting only an activity (10c). However, according to Paul (1905:185f.) German too formerly showed such variation, though apparently not as consistently as Dutch; cf. (10d), which is no longer possible in modern German. Speakers also are known to vary as to which verbs allow this variation (e.g. for some speakers not *schwimmen*).

(10) a.*Ich bin den ganzen Tag gelaufen.*

b. *Ik heb de hele dag gelopen.* 'I ran [around] all day long.'

c. *Ich bin stundenlang auf der Stelle gelaufen.* 'I ran in place for hours.'

d. *Ihr habt gelaufen und ihr habt gesprungen.* 'You have run and you have jumped.'

Elsewhere (Shannon to appear a,b) I show that all the transitivity parameters are relevant to perfect aux selection, so I will not repeat that demonstration here. I would like to mention some further examples, however. Volitional control e.g. can sometimes lead to a verb of motion being construed as denoting an activity as opposed to a telic/punctual change of position (accomplishment), thus taking HAVE in the perfect. Although the clause is still intransitive, it is not mutative (subject = actor, ≠ undergoer) and the aspect imperfective (activity, not accomplishment). One of the nicest examples of this involves the German verb *donnern* 'to thunder', which also can mean 'to knock with a thunderous rap' or 'to crash into thunderingly.' In the former volitional meaning it takes HAVE (11a), but in the latter non-volitional meaning BE (11b). In addition, only the former can be passivized (11c); as I have argued elsewhere (Shannon 1987, 1988) only verbs with agentlike subjects allow passivization. Cf. Paul (1905:202) and Curme (1960:291). Other weather verbs like *schneien* 'to snow' also allow such varying possibilities, but only if the subject is a referential entity expressing the THEME (cf. 12a vs. b). Of course, in the literal non-motional meaning the auxiliary is always HAVE (12c).

(11) a.*Er hat stundenlang/*in einer Stunde gegen die Tür gedonnert.*
'He thundered [= pounded] against the door for hours/*in an hour.'

b. *Er ist (ausgerutscht und) (*stundenlang) gegen die Tür gedonnert.*
'He (slipped and) thundered [= slammed] into the door (*for hours).'

c. *Da wurde plötzlich mit Gewalt gegen die Tür gedonnert.* 'Then suddenly there was violent thundering against the door.' [only volitional reading.]

(12) a.*Die Eltern sind (*stundenlang) bei uns hereingeschneit.*
'The parents "snowed into" our place (*for hours).'

b. *Es hat (stundenlang/*in einer Stunde) bei uns hereingeschneit/-geregnet.*
'It snowed/rained into our place (for hours/*in an hour).'

c. *Es hat (stundenlang/*in einer Stunde) geschneit/geregnet.*
'It snowed (for hours/*in an hour).'

Of course in both languages a different (metaphorical) meaning of a given verb which literally denotes movement can motivate a different choice of perfect auxiliary, especially if the meaning is then imperfective (activity, not achievement). In standard Dutch e.g. *gaan* 'to go' normally takes BE, but in the expression *schoolgaan* 'to go to [i.e. attend] school' HAVE; also, in the meaning 'to go off (of a bell/phone)' either auxiliary is found in Dutch (13a/b adapted from ANS:518; cf. Paul 1905:184 for German). In (13c) the verb is transitive (cf. next section). Similarly, although in Standard German *gehen* 'to go' always takes BE as its auxiliary, in some dialects (e.g. Cologne) it takes HAVE in the meaning 'to go well/poorly' (Paul 1905:184), as in (13d).

(13) a.*We hebben (jarenlang) samen school gegaan.*
'We went to school together (for years).'

b. *De bel/telefoon heeft/is (urenlang) gegaan.*
'The bell/telephone went off [= sounded] (for hours).'

c. *Hij heeft zijn straf lijdzaam ondergaan.*
'He underwent/endured his punishment submissively.'

d. *Het hät doch immer, immer, immer jot jejange.* 'It has always [3x] gone well.'

Paul (1905:190) also observes that *gefallen* 'to please' originally was used with BE in the perfect but later switched to HAVE, as opposed to *fallen* 'to fall', which is still used with BE in the perfect. In modern Dutch the verb *bevallen* 'to please' can now be used either with HAVE or BE. The shift of aux here probably reflects the loss of the original metaphorical meaning (possibly from the falling of dice or lots; cf. E *The dice/cards fell right for me.* or *It fell/went my way.*) which motivated BE in the first place. With G *bekommen*, however, there's no change in perfect aux: in the meaning 'to receive' it takes HAVE, but BE when it means 'to agree with' (cf. E *Her dress becomes her.*). Although we could probably not predict these usages, we can still make sense of them: the meaning most resembling a given prototype ('to fall' = mutative, 'to receive' = transitive) is associated with that aux, whereas the meaning which less closely approximates the prototype ('to please' ≠ mutative, 'to agree with' ≠ transitive) takes the opposite aux (14). Consequently, the aux helps in the perfect to disambiguate the two meanings involved.

(14) a.*Die Vase ist (dem Hans) gefallen.* 'The vase fell ([from] Hans [=dat.]).'

b. *Die Vase hat (dem Hans) gefallen.* 'The vase pleased (Hans [= dat.]).'

c. *Dem Hans ist das Essen bekommen.* 'The food agreed [with] Hans [dat.].'

d. *Der Hans hat das Essen bekommen.* 'Hans [nom.] received the food [acc.].'

4. Transitivity: What's an object? We have indicated that transitivity is an important factor in determining whether HAVE or BE is selected as the perfect auxiliary. However, transitivity, esp. the notion of object, is more intricate and complicated than would appear at first blush. As always, the prototypical extremes are quite clear, but there are instances which don't easily fit either extreme and therefore are subject to a certain amount of variation in interpretation or construal regarding their transitive character. Traditional accounts are aware of the problem of transitivity. Curme (1960:288, 491-2; cf. Paul 1905:206; all examples below but (f) from these sources) notes e.g. "Verbs that take a cognate accusative... are not real transitives, and hence usually take **sein** where the simple verb is conjugated with **sein**... **Haben** is, however, used here when the idea of motion disappears and that of an act or activity [i.e *Aktionsart*! TFS] becomes prominent [15g, TFS]... Present usage, however, inclines sometimes also here toward **sein** in accordance with the general trend of intransitives toward **sein** [15h, TFS] ..." Some of these putative objects are (former) obliques (genitives), others are adverbials indicating distance, time or extent of motion; in the latter cases the adverbial nature can be seen by the fact that they would be questioned by adverbs, not by NPs.

(15) a.*Er ist eines gewaltsamen Todes gestorben.* 'He died a violent death [gen.].'

b. *Die Sache ist ihren Gang gegangen.* 'The matter ran its course.'

c. *Ich bin diesen Weg nie geritten.* 'I have never ridden this way.'

d. *Er ist drei Meilen/Stunden gegangen.* 'He has gone three miles/hours.'

e. *Er ist die Zimmer alle durchgegangen.* 'He went through all the rooms.'

f. *Wir sind dritte(r) Klasse gefahren.* 'We traveled third class [gen./acc.].'

g. *Die Soldaten haben zweimal Sturm gelaufen wider die Mauer.*
'The soldiers have twice "run storm", i.e. stormed, the wall.'

h. *Ich bin/habe große Gefahr gelaufen.* 'I ran great danger/risk.'

Hopper & Thompson's (1980) parameter of individuation also seems to play a significant role. Thus, as we noted earlier, *fahren* 'to drive' takes HAVE when used transitively (cf. 6a, c), but if the object is not individuated, and indeed non-referential and incapable of (contrastive) stress, BE is the perfect aux (16a & b from Curme 1960:491, 288). Similarly with other complex verbs such as *Skifahren/-laufen* 'to ski' and *Rollschuh-* or *Schlittschuhlaufen* 'to roller-/ice-skate' (16c,d).

(16) a. *Schon damals bin ich für mein Leben gern Elektrische gefahren.*
  'Already then I liked for the life of me to ride [the] electric [railway].'

  b. *Ich bin so lange Eisenbahn gefahren, daß mich alle Kondukteure kannten.*
  'I rode the train so long that all the conductors knew me.'

  c. *Er ist noch nie Auto/Ski gefahren.* 'He has never yet driven a car/skied.'

  d. *Wir sind Rollschuh-/Schlittschuhgelaufen.* 'We roller-/ice-skated.'

These non-referential 'objects' are incorporated into the verb: they are often written together with it as a single word and function not as true objects—they could in fact more easily be viewed as indicating the kind or manner of motion (activity!) rather than an affected (undergoer) object. This correlates with Hopper & Thompson's observation (1980:259) that the nominal is "a subordinate part of a compound of which the verb stem is the head." Haiman (1983:795f.) connects this detransitivizing effect across languages with iconicity: "The linguistic separateness of an expression corresponds to the conceptual independence of the object or event which it represents". The incorporated nominal doesn't represent an independent object, so the clause contains only a single participant and a complex intransitive predicate. Similarly, the reflexive pronoun in French and Italian is incorporated into the verb thereby leading to detransitivization and the use of BE as perfect auxiliary; cf. Shannon (to appear a,b).

Similar observations can also be made about Dutch as well. Thus, even with intensification including a reflexive (b), cognate objects do not usually transitivize a clause (17 a, b from ANS:520). However, examples of incorporated objects with BE are difficult if not impossible to construct in Dutch (17c; cf. 13a also), since the verbs are then atelic motional activity verbs and not perfective (telic) achievement verbs.

(17) a. *Zij is de heldendood gestorven.* 'She died a hero's death.'

  b. *Die jongen is zich een aap geschrokken.*
  'That boy was scared crazy.' (lit. 'scared himself an ape').

  c. *Hij heeft nog nooit auto-/schaatsengereden.* 'He has never driven a car/skated.'

Furthermore, in some Dutch cases (cf. 18a; cf. Hoekstra 1984:170ff.—whence all examples below; Paul 1905 for German), an NP can be construed either as the nominal object in a particle verb construction, in which case it is relativized with a relative pronoun (*dat*), or else as a prepositional object (= adverbial), in which case it is relativized with a relative adverbial (*waar*). According to Hoekstra, when a pure NP appears either HAVE or BE is permissible as perfect aux, as in (18b). However, with relatives there's apparently a nice correlation: if the adverbial form of the relative is chosen BE is favored (18c), while HAVE correlates with the nominal relative (18d).

(18) a. *het kanaal dat/waar we over zwemmen* 'the canal which we swim over'

  b. *dat wij het kanaal over zijn/hebben gezwommen.* 'that we swam over the canal.'

  c. *het kanaal dat/*waar we over hebben gezwommen.*

  d. *het kanaal waar/*dat we over zijn gezwommen.*

Although we probably could not predict it, this is precisely the correlation we would expect under our analysis: when the element is clearly marked as adverbial (i.e. object of the postposition) the clause is intransitive and the aux BE; only when the element is not clearly marked as object of the preposition can it be (and for at least some speakers apparently must be) interpreted as the verbal object in a transitive clause, then with HAVE naturally. The choice of perfect aux is clearly motivated by differences in the transitivity of the clause, i.e. the object status of the nominal.

This also relates to other puzzling examples: some verbs don't allow the nominal relative or HAVE as aux (19). What seems to be involved here is another transitivity parameter: the volition (and perhaps potency) of the subject. A verb like *afgleden* 'to slide' doesn't attribute volition (or potency) to its subject, which is actually more an affected entity (undergoer) than an agentlike entity (actor). Therefore, such a clause is inherently less transitive than ones with volitional subject verbs like *zwemmen* 'to swim'; and not surprisingly it doesn't allow the NP in question to be interpreted as an object (undergoer). In this much less transitive clause only BE is possible. Lest it be felt that our explanation is ad hoc, we can cite further evidence from Hoekstra that indeed the subject of *afgleden* is not agentlike: as opposed *zwemmen*, the clause with *afgleden* does not allow passivization, which shows that the subject is not agentlike (cf. 20).

(19) a.*de helling die we af gegleden hebben.*

b. *de helling waar we af gegleden zijn.* 'The slope *where/that we slid down.'

(20) a.*Dat kanaal is nog nooit door iemand over gezwommen*
'That canal has never yet been swum over by anyone.'

b. *Die helling is nog nooit door iemand afgegleden.*
'That slope has never yet been slid down by anyone.'

Another relevant factor in determining the object status of a given NP is the morphosyntactic coding system in effect in the language. Prototypical instances of transitive clauses contain accusative objects, which code a more affected, nonpotent entity—an undergoer—whereas dative objects denote less of an undergoer and clauses containing them are less transitive. Haiman (1983:790f.) points out that across languges "the verb is understood as transitive if the object occurs in the accusative case, but as intransitive if the object occurs in a variety of oblique cases" (cf. 15). A good example is formed by the related German verbs *folgen* 'to follow' vs. *verfolgen* 'to pursue, persecute'. *Folgen* takes a dative object, hence counts as intransitive and takes BE as perfect aux, whereas *verfolgen* (cf. *befolgen*) has an accusative object, thus is transitive and takes HAVE (21).

(21) a.*Er ist mir nach Hause gefolgt.* 'He followed me home.'

b. *Sie hat den Weg bis an den Fluß verfolgt.* 'She pursued the path to the river.'

c. *Die Römer haben die Christen verfolgt.* 'The Romans persecuted the Christians.'

The differences in morphosyntax correlate with the semantic differences between the two verbs, both of which describe roughly the same situation but construe it very differently. The object of *folgen* is more in control, potent (e.g. determines the direction)—hardly an affected entity—while the subject is less potent, less in control—it is in fact more an undergoer (theme), as paraphrases like *nachgehen/-laufen* 'to go/run after' show. With *verfolgen*, on the other hand, the subject is far more active, potent, and in control—it is construed as actually acting upon the object, which is not potent or in control but rather affected. The difference in object case marking here is not simply an arbitrary syntactic phenomenon but rather motivated by the differences in meaning. For more on this, cf. Smith (1987:chap. 5, esp. 378ff., 392f.).

Turning to Dutch, the loss of case marking has clearly left its mark on the perfect aux. Since Dutch inflectional morphology no longer marks less affected (dative) vs. more affected (accusative) objects, we find apparently transitive verbs taking BE (22; cf. ANS:519 and Donaldson 1981:142). However, the transitivity of these verbs is not at all clear. In fact, the German equivalents (*nahen*, *entgegenkommen*) still govern a dative object and take BE, as was previously the case in Dutch, which indicates that the objects of these verbs were originally viewed as less affected (goal, not patient). Since these are verbs of motion, they continue to take BE in modern Dutch, even though the motivation is now less transparent since no longer overtly coded by morphosyntactic distinctions.

(22) a.*De vijand is de stad genaderd.* 'The enemy approached the city.'

    b.*Ik ben hem op straat tegengekomen.* 'I ran into him on the street.'

Just as Hawkins (1985) has noted for English, the collapse of case marking in Dutch has brought about a merger of different semantic roles into a single, semantically ambiguous grammatical relation of object. Given that there is no morphosyntactic coding to fall back on, speakers of Dutch must rely on meaning to determine whether the clause is transitive and thus which aux is appropriate. This leads in certain circumstances to a shift in aux depending on the meaning intended. Thus, like all motional activity verbs in Dutch, *volgen* 'to follow' takes BE when telic/punctual (23a), but HAVE when expressing a durative activity (23b). However, when the verb is used in the figurative—clearly **not** mutative!—senses of 'to listen to', 'to attend', or 'to imitate' the aux is always HAVE (23c-e; ANS:522-23 and Donaldson 1981:145).

(23) a.*Ik ben hem tot de voordeur van zijn huis gevolgd.*
    'I followed him to the front door of his house.'

    b.*De politie heeft hem weken lang gevolgd.* 'The police followed him for weeks.'

    c.*Jan heeft de spreker aandachtig gevolgd.* 'Jan followed the speaker attentively.'

    d.*Ik heb colleges bij hem gevolgd/gelopen.* 'I attended lectures by him.'

    e.*Ze hebben het verkeerd voorbeeld gevolgd.* 'They followed the wrong example.'

The following examples (c & f adapted from ANS:520, 522; others from Donaldson 1981:142, 145) also seem arguably transitive but take BE in the perfect.

(24) a.*Ik heb/ben mijn paraplu/je naam vergeten.* 'I forgot my umbrella/your name.'

    b.*Ik ben/heb mijn horloge verloren.* 'I lost my watch.'

    c. *Hij is een zaak in de stad begonnen.* 'He started a business in the city.'

    d.*Zij is al aan (met) haar huiswerk begonnen.*
    'She began on (with) her housework already.'

    e. *De winter is gisteren begonnen.* 'Winter began yesterday.'

Taking 'forget' as representative, observe that the transitivity of this verb is not clear. Is forgetting something that one does or something that happens to one? In fact, the verb used to be—and still is in certain German dialects—intransitive, i.e. the object oblique, either a genitive or prepositional object (*Ich habe darauf/dessen vergessen*; cf. Kern 1912:79ff. for Dutch; and Curme 1960:513 for German). With the previously mentioned case loss in Dutch the different semantic roles coded by the earlier morphosyntactic differences were no longer marked on the surface, causing a collapsing of semantic roles into a single object relation. The presence of other verbs in the language which 'looked' transitive but acted intransitive may well have helped the reanalysis of 'forget' as a verb which takes BE as its perfect aux. Moreover, the subject is certainly not your prototypical actor (i.e. agentlike) subject; in fact, the subject could just as well be construed as an undergoer, as is the case in other languages. We can cite here Latin

obliviscor, a deponent (medio-) passive verb, which codes the undergoer subject of an intransitive clause. In addition Foley & Van Valin (1984:96) note that in Eastern Pomo 'forget' is one of the verbs morphosyntactically marked for an undergoer subject.

Furthermore, *vergeten* previously also occurred in an impersonal undergoer construction: *des* [gen.] *(het) is mij* [dat.] *vergeten*, which Kern (1912) glosses as 'it has gone from my memory'. This fits very well the conventional imagery often invoked in Dutch and German with respect to mental contents, the so-called 'conduit metaphor' (cf. Langacker 1987:161; further references there), in which mental contents are imaged as objects which enter and exit mental space, thereby motivating the use of BE as the perfect aux: D *te binnen schieten* lit. 'to shoot inside' and G *einfallen* lit. 'to fall inside', both taking dative experiencer objects and meaning 'to occur to someone'. The most telling cases are paraphrases of 'forget' which employ this metaphor and take dative objects and BE: D *ontschieten* lit. 'to shoot away', G *entfallen* lit. 'to fall away'. Cf. also older expressions in German like *einem aus dem/in den Sinn/Kopf gehen/kommen* lit. 'to go/come out of/into one's mind/head'. Note also that grammars of Dutch often state that HAVE is used to mean 'to neglect to do, leave behind', whereas BE is used in the meaning 'not to remember'; in actual practice the current trend seems to be toward BE always. Interestingly, Curme (1960:513) claims that in some forms of German there is a similar meaning difference: the accusative object is found when the verb means 'to leave behind', but with the prepositional object the meaning is 'not to think of'. Both these observations fit our analysis: the reading involving loss of mental content (conduit metaphor) is coded in both languages as intransitive, with an undergoer subject, whereas the other, more active meaning is coded as transitive.

Given these observations it is not surprising that a verb like *vergeten* might be reinterpreted to take BE as its perfect aux: maybe we couldn't have predicted it, but we certainly can make good sense of it. Kern (1912) and Paul (1905) also note that the participial form of the verb formerly could mean 'forgetful, unmindful', which may also have helped motivate this reinterpretation. In view of the similarity of meaning, it is not unusual that the verb 'to lose' also is seeing a shift to BE; cf. the similar meaning in *ik ben mijn sleutels kwijt* 'I am rid of [= have lost] my keys.' Finally, with aspectual verbs like *beginnen* the same differences of interpretation can be found as with 'forget'. Note first of all that this verb has a transitive (24c) and an intransitive (24e) usage (cf. Perlmutter 1970 on English); the intransitive use is not problematic for our present concerns. Moreover, as Kern (1912) and Paul (1905) point out, the perfect passive may well have played a role here. As far as the 'transitive' usage is concerned, even today there are alternate intransitive constructions with an oblique object (cf. 24d).

We have tried to show here that besides *Aktionsart* transitivity is intimately connected with the choice of perfect aux and that this concept is quite complex. In simple prototypical cases there is little or no room for doubt as to the (in-)transitivity of a given clause, but in non-prototypical cases the issue is not at all clear. In particular, there is possibility of overlap, differences in interpretation and therefore different auxiliaries.

5. Differences in conventional imagery and construal. Finally, if we take conceptual imagery and the meaning differences potentially signalled by morphology seriously we can make sense of examples which some formal syntacticians find puzzling. For instance, Haider (1985:235) rejects the claim made by Heidolph (1984:3.1, §114; cited by Haider as §15) that mutative-perfective verbs take BE: "What kind of *Aktionsart* difference conditions the different choice of auxiliary for verbs *begegnen* — *treffen*; *helfen* versus *zu Hilfe kommen*, *einen Fehler bemerken* versus *auf einen Fehler stoßen...*" Of course Haider conveniently ignores the fact that the aux is a function not just of *Aktionsart* but also transitivity. Taking just one example, both *begegnen* and *treffen* mean

approximately 'to meet', but the former takes BE, the latter HAVE. This seems to be an arbitrary syntactic difference between the two verbs, provided we are satisfied with the very rough-hewn sort of semantics that Haider apparently envisages. However, on more careful inspection other differences quickly surface: the two verbs construe approximately the same situation in very different ways. For example, *treffen*, which literally means 'to hit, strike,' is definitely transitive and takes an accusative direct object (denoting a clearly affected entity, a patient, thus low in potency and control) and its subject is highly potent, in control, and the energy source. It obviously construes the situation in a highly transitive fashion. *Begegnen*, on the other hand, which means more 'to encounter', takes a dative object—denoting a less affected entity—and does not have such a literal meaning of impacting an object; rather it implies motion toward that goal. For more on these verbs from the viewpoint of cognitive grammar, cf. Smith (1987:391f.). Perhaps we could not predict a priori that this difference in perfect auxiliary would exist, but certainly it is not arbitrary either, because it can be seen to be motivated by the differences in meaning, inter alia the affectedness of the object—whether it represents the goal of the motion or the entity affected by the action.

Similarly, Hoekstra (1984:186) notes that *opvallen* 'to occur to one' "is semantically very close to *treffen* ['to strike one's attention], but *treffen* has all the reverse [syntactic properties]." Thus, while *opvallen* takes BE, cannot passivize, and its participle must be predicated of its subject, *treffen* takes HAVE, allows passive and its participle must be predicated of its object. Hoekstra sees here "an indication of the doubtful status of the claim that initial grammatical relations [i.e. unaccusativity, TFS] are predictable on the basis of semantic roles." But this totally disregards the clear semantic differences between the two verbs, which—while both employing the conduit metaphor mentioned earlier—construe roughly the same situation in very different ways. In fact the two construals of the situation very nicely approximate the mutative and transitive prototypes: whereas *opvallen* represents the mental object as coming (up) into consciousness (cf. E *It occurs to me.*), *treffen* portrays the idea as actually making contact with the mental organ (cf. E *It strikes me.*). The properties observed by Hoekstra then fall out naturally: the difference in passivizability is due to the difference between actor vs. undergoer subjects, and the participle is always predicated of the undergoer, which is the subject of *opvallen* but the object of *treffen*.

Therefore, perfect aux choice is certainly understandable, and even largely predictable (though perhaps not fully: on predictability vs. motivation cf. Langacker 1987:47ff.; Lakoff 1987:438f.) based on our framework, which takes semantic roles and construal seriously into account. What one can't do is predict, or even understand, perfect aux choice based on the very general meaning characterizations given by Haider and Hoekstra: one has to understand (as native speakers but not always linguists do) how a given verb construes a situation. There is surely nothing unusual or surprising in this; it should by now be common knowledge, at least among linguists. Both within the same language and across related languages we can find any number of expressions which construe the same basic situation in very different ways, even though their meaning is generally similar. Lexical converses like 'give' vs. 'receive' or 'buy' vs. 'sell' are obvious and well-known examples of this. To take an example affecting perfect aux, German and Dutch have different verbs meaning roughly 'to happen' but taking different perfect auxiliaries: G *geschehen* and D *gebeuren* take BE, but G *stattfinden* (cf. also *sich ereignen*) and D *plaatshebben* take HAVE. Despite their somewhat similar meaning, however, these verbs aren't synonyms: they construe the situation very differently. *Geschehen/gebeuren* are clearly intransitive mutatives (which can also mean 'to happen to someone' with a dative object in German); cf. also G *zustoßen* 'to happen to someone', which literally means 'to bump, push (in)to someone' and clearly involves a movement metaphor.

Stattfinden/plaatshebben correspond more to the transitive prototype: they're patently derived from old transitive constructions meaning literally 'to find/have place'.

Across these languages there are also similar differences in conventional imagery. Just to take one example, in German the verbs meaning 'to gain/lose weight' take HAVE (25a), but their Dutch counterparts BE (25b; cf. Donaldson 1981:142). This might seem strange until one realizes what conventional imagery is involved: the varying images here motivate the different auxiliaries. In German the expressions are based on a transitive verb and literally mean 'to take off/on weight' (cf. E 'to take off/put on weight'!), whereas in Dutch the expressions are intransitive mutatives meaning literally 'to fall off, come on (by so much) weight'. Although we doubtless could not predict what images each language would select to express these contents, we can certainly understand (and probably could predict, if we didn't already know) the choice of perfect auxiliaries based on our understanding of the conventional imagery behind them.

(25) a.*Zij is twee kilo afgevallen/aangekomen.*

b. *Sie hat zwei Kilo abgenommen/zugenommen.* 'She lost/gained two kilos.'

6. Conclusion. The present paper continues a line of research begun in previous work (Shannon to appear a,b) on the perfect auxiliary in German and Dutch. As opposed to recent proposals informed by the 'unaccusative hypothesis', we view perfect aux selection not as governed by formal syntactic criteria but rather in terms of semantic factors. In our view, perfect aux choice is a function of *Aktionsart* and transitivity, based on the transitive (HAVE) and mutative (BE) prototypes. Situations which do not fit either prototype vary according to the interpretations given them regarding transitivity and *Aktionsart*. Important differences include the presence of an object and the semantic role of the subject—for transitives an actor and for mutatives an undergoer. Concerning *Aktionsart* (cf. Dowty's aspectual classes), the prototypes are both perfective, so that imperfectives (states and activities) are not covered by them; HAVE has become the default verb here in German and Dutch. Moreover, the criteria are 'fuzzy'; specifically the perfectivity or transitivity of a clause may vary. Finally, one must take differences in conceptual imagery seriously in order to truly understand many cases of perfect aux selection. Roughly synonymous verbs can construe a situation very differently, thereby motivating opposite auxilaries—a point often overlooked or ignored by formal syntacticians. Consequently, the absolute predictability which linguists so often seek is usually not a realistic goal. What we can and must do, however, is understand and appreciate the varying motivations for perfect aux selection which are based on conceptual content and are a function of both *Aktionsart* and transitivity.

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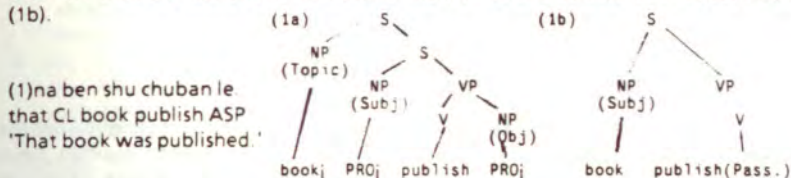
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Passivization in Chinese rather than topicalization

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0. Structural ambiguity

Chinese is a SVO language with optional sentence-initial topics. Yet, neither topic nor subject is indicated by case marking or verb-subject agreement. The language also allows pro-drop freely. These peculiarities, put together, make structurally ambiguous sentences whose predicators are transitive and whose sole preverb NPs bear the theme/patient role. Sentences like (1) has two structural analyses (1a) and (1b).

(1a)

```
              S
         /         \
        NP           S
      (Topic)    /       \
               NP          VP
              (Subj)    /      \
               |       V        NP
               |       |       (Obj)
               |       |        |
             book_i   PRO_j   publish  PRO_i
```

(1b)

```
        S
     /     \
    NP       VP
  (Subj)     |
    |        V
    |        |
  book   publish(Pass.)
```

(1) na ben shu chuban le.
that CL book publish ASP
'That book was published.'

The analysis (1a) (Li & Thompson 1981) considers the 'book' as topic followed by a null agentive subjec, but the analysis (1b) (Wang 1957; Chao 1968) considers the same preverb NP as the subject of the passivized predicator *chuban* 'publish' which, for lack of passive morpheme in Chinese, is homonymous to its active counterpart.

In this paper, I am going to argue for analysis (b) and against (a), that is, the construction concerned is passive. My argument is 1) cross-linguistic characteristics of topic and subject verify the NP concerned to be subject rather than topic; 2)the morpholexical nature of passivization in Chinese is further shown in the interaction between passivization and other morpholexical processes such as resultativization and locative inversion and 3)the homophony of active and passive forms of verbs is witnessed in head-final compound nouns N[V N], in which the verb component has either active or passive reading in relation to the noun component.

1. Subject and topic verifying tests

Both subject and topic are notions of universal grammar. Although they are coded differently from language to language, they have the same response to certain grammatical processes cross-linguistically (Keenan 1975; Li & Thompson 1975). In other words, NPs verify themselves as undertaking a certain GF by how they behave rather than how they look. If the same terms are going to be used for research on Chinese, what they refer to in this language has to have the same behavior as their namesake does in other languages. However, as far as I know, neither those who consider the preverb NP in (1) as topic, nor those who consider it as subject provide any evidence for its topichood or subjecthood. They both overlook the self-verifying properties of GFs displayed when facing some grammatical processes and rely solely on word order. Yet, since the NP concerned is both sentence-initial (a position necessary to be topic in Chinese) and preverb (a position necessary to be subject in Chinese), the clues from word order would lead to three identifications for 'the book'

in (1) -- the topic, the subject, or both in one. I am now going to check the NP in question with characteristic properties of subject/topic and pick up one identification out of the three.

1.1. Cleavability. A subject can be cleft, but a topic cannot. A topic has to be of given information, that is, 'the knowledge which the speaker assumes to be in the consciousness of the addressee at the time of utterance (Chafe 1975).' For example, while when uttering (2a), the speaker may or may not assume that the addressee is thinking of Lee at that moment, he certainly does, when uttering (2a').

(2)a. qiche zuotian zai San Jose ya-shang le Lisi.
　　car yesterday LOC San Jose hit-injured ASP Lee
　　'The car hit Lee to injury at San Jose yesterday.'
a'. (Lisi), qiche zuotian zai San Jose ya-shang le.
　　(Lee), car yesterday LOC San Jose hit-injured ASP
　　'(Lee), the car hit him to injury at San Jose yesterday.'

On the other hand, in Chinese, preverb constituents can be cleft to highlight what the speaker assumes as new information, that is, 'what the speaker assumes he is introducing into the addressee's consciousness by what he says (Chafe 1975). In Chinese, cleaving is done by prefixing the cleft with *shi-*. Although sentences in (2a-b') state the same fact, they differ in the speakers' assumption about how much the addressee knows the detail of the accident: (2a) has nothing in it assumed as already given, whereas (2a') has the assumption that the addressee has Lee in his consciousness and (2b-b') have the assumption that Lee's being injured at San Jose yesterday is known to the addressee, but what injured him is assumed to be the new information.

b. shi-qiche zuotian zai San Jose ya-shang le Lisi.
　　SHI-car yesterday LOC San Jose hit-injured ASP Lee
　　'It was a car that hit Lee to injury at San Jose yesterday.'
b'. Lisi, shi-qiche zuotian zai San Jose ya-shang le.
　　Lee, SHI-car yesterday LOC San Jose hit-injured ASP
　　'Lee, it was a car that hit him to injury at San Jose yesterday.'

The very function of cleaving to introduce new information to the discourse makes it inapplicable to topic as shown in (2c), since topics are, by definition, of given information.

c. (*shi)-Lisi, qiche zuotian zai San Jose ya-shang le.
　　(*SHI)-Lee, car yesterday LOC San Jose hit-injured ASP
　　'(*It is) Lee (that), a car hit him to injury at San Jose yesterday.'

Yet, the preverb NP in both (2d) and (1) can be cleft, as shown in (2d') and (2e), which indicates that these NPs are subjects, not topics.

d. Lisi ya-shang le.　　　　　d'. Shi-Lisi ya-shang le.
　　Lee hit-injured ASP　　　　　SHI-Lee hit-injured ASP
　　'Lee was hit to injury.'　　　　'It was Lee who was hit to injury.'

e. Shi-na ben shu chuban le. (cf (1))
  SHI-that CL book publish ASP
  'It is that book that was published.'

1.2. Questionability. A subject can be questioned, but a topic cannot. Another contrast between a topic and a subject also follows the giveness of topic: a subject can be questioned, but a topic cannot, since when one is asking a wh-question, he certainly does not know its referent yet, but a topic, by definition, cannot be something whose referent is unknown. The contrast in acceptability between (3a') and (3b') is a contrast in questionability between subject and topic.

(3)a. haizi gaosu Lisi PRO le.   a'. shui gaosu Lisi PRO le?
       child tell Lee PRO ASP   who tell Lee PRO ASP
       'The child told Lee (about it).'   'Who told Lee (about it)?'
   b. Lisi$_i$, haizi gaosu ta$_i$ PRO le.   b'. *shui$_i$, haizi gaosu ta$_i$ PRO le?
       Lee$_i$, child tell him$_i$ PRO ASP   who$_i$, child tell him$_i$ PRO ASP
       'Lee$_i$, the child told him$_i$ (about it).'   '*It is who that the child told(about)it?'

However, the preverb NP in (3c) and (1) can be questioned, as shown in (3c') and (3d), which indicates that these NPs are subjects not topics.

c. najian shi gaosu Lisi le.   c'. shenmo gaosu Lisi le?
   that matter tell Lee ASP   what tell Lee ASP
   'The matter was told to Lee.'   'What was told to Lee?'
d. shenmo chuban le? (cf (1))
   what publish ASP
   'What was published?'

1.3. Anaphora. A topic, but not a subject, binds a pronominal GF; a subject, but not a topic, binds a reflexive. While a topic may corefer with a pronominal GF, overt or null, a subject may not. Just as contrastive are their responses to a reflexive-- a subject, but not a topic, binds a reflexive, although in English they must be subjects in the same clause where the reflexives are, in Chinese they could also be in clauses that dominate the ones where the reflexives are. For example

(4)a. Lisi$_j$, John$_i$ jiao le ta$_{j/*i}$ ziji$_{i/*j}$ de kanjia benling.
       Lee$_j$, John$_i$ teach ASP him$_{j/*i}$ self$_{i/*j}$ POSS best repertoire
       'Lee$_j$, John$_i$ taught him$_j$ the best of his$_i$ repertoire.'
   b. John$_j$, Lisi$_i$ gen ta$_{j/*i}$ xue le ziji$_{i/*j}$ de kanjia benling.
       John$_j$, Lee$_i$ from him$_{j/*i}$ learn ASP self$_{i/*j}$ POSS best repertoire
       'John$_j$, Lee$_i$ learned from him$_j$ the best of his$_i$ repertoire.'
   c. Lisi$_i$, lingdao$_j$ xiafang ta$_i$ daole ziji$_{*i}$ zui taoyan de nongchang.
       Lee$_i$, leader$_j$ demote him$_i$ to self$_{*i}$ most dislike MOD farm
       'Lee$_i$, the leader$_j$ demoted him$_i$ to the farm he$_j$ disliked most.'

Anaphora in sentences with their sole preverb NP bearing the theme/patient role also argues for the subjecthood of the NP: 1) Lee, as the sole preverb NP, binds the reflexive in (4c'), in contrast to (4c), where Lee, as topic, does not bind the reflexive;

c'. Lisi₁ xiafang daole ziji₁ zui taoyan de nongchang.
  Lee₁ demote to self₁ most dislike MOD farm
  'Lee₁ was demoted to a farm he₁ disliked most.'

2) Lee has disjoint reference with *ta*, the 3rd/SG pronoun in (4e') in contrast to (4d), where Lee, as topic, corefers with the pronoun; 3) if Lee were the topic of (4e), the only difference between (4e) and (4e') should be the absence/presence of a resumptive pronoun and the meaning difference attested should not occur.

d. Lisi₁, lingdao₁ xiafang ta₁ daole nongchang.
  Lee₁ leader₁ demote him₁ to farm
  'Lee₁, the leader₁ demoted him₁ to a farm.'
e. Lisi xiafang daole nongchang.   e'. Lisi₁ xiafang ta•₁ daole nongchang.
  Lee demote to farm   Lee₁ demote him•₁ to farm
  'Lee was demoted to the farm.'   'Lee₁ demoted him₁ to a farm.'

1.4. Adjunct control.   A subject, but not a topic, controls ADJs. As observed both cross-linguistically and in Chinese in particular (Y. Hashimoto 1971), adjuncts are controlled by subject, not by topic. The adverbials 'orally coach personally instruct' and 'ear hear, mind memorize' describe teaching and learning, respectively. In (5a-a'), 'teach' is the predicator, but in (5b-b'), 'learn' is the predicator. The contrast between the acceptable (5a) and (5b') and the awkward (5a') and (5b) comes from the semantic mismatch between the adjunct and the subject in the latter, but not in the former: a teaching process can be carried out by 'orally coach personally instruct' in (5a), but a learning process cannot in (5a') and it is the other way round with 'ear hear, mind memorize'.

(5)a. Lisi₁, John₁ (yan-chuan-shen-jiao) jiao le ta₁ benling.
  Lee₁, John₁ (orally-coach-personally-instruct) teach ASP him₁ skills
  'Lee₁, John₁, (by oral coach and personal instruct), taught him₁ the skills.'
a'. Lisi₁, John₁ (?? er-ting-xin-ji) jiao le ta₁ benling
  Lee₁, John₁ (?? ear-hear-mind-memorize) teach ASP him₁ skills
  'Lee₁, John₁, (?? by ear-hear-mind-memorize), taught him₁ the skills.'
b. John₁, Lisi₁ (?? yan-chuan-shen-jiao) gen ta₁ xue le benling.
  John₁, Lee₁ (??orally coach personally) instruct from him₁ learn ASP skills
  'John₁, Lee₁, (?? by oral coach and personal instruct), learned from him₁ the skills.'
b'. John₁, Lisi₁ (er-ting-xin-ji) gen ta₁ xue le benling.
  John₁, Lee₁ (ear-hear-mind-memorize) from him₁ learn ASP skills
  'John₁, Lee₁, (by ear-hear-mind-memorize), learned from him₁ skills.'

The adjunct in sentences whose sole preverb NP bears the theme/patient role is controlled by the very NP as shown in (5c') and (5d'). The awkawdness of the former is due to the mismatch between the adjunct 'mercilessly' and the subject 'Lee', the victim of the demotion, in contrast to (5c), in which 'the authorities,' as subject, matches the adjunct perfectly. However, when the adjunct is replaced by 'indifferent', the acceptability also changes: Lee, as subject in (5d'), has no conflict with 'indifferent' as do the authorities, as subject of (5d).

c. shangji (haobuliuqingde) xiafang Lisi daole nongchang.
   authorities (mercilessly) demote Lee to farm
   'The authorities (mercilessly) demoted Lee to the farm.'
c'. Lisi (??haobuliuqingde) xiafang daole nongchang.
   Lee (??mercilessly) demote to farm
   'Lee (??mercilessly) was demoted to a farm.'
d. Lisi₁, shangji (??manbuzaihude) xiafang PRO₁ daole nongchang.
   Lee₁, authorities (??indifferent) demote PRO₁ to farm
   'Lee, the authorities, (??indifferently), demoted to the farm.'
d'.Lisi₁ (manbuzaihude) xiafang daole nongchang
   Lee (indifferent) demote to farm
   '(Indifferent), Lee was demoted to a farm.'

1.5 Subordinate clause control. A subject, but not a topic, may be pro, if it is of a subordinate clause and corefers to the subject of the main clause. In complex sentences composed of *yinwei + S₁...suoyi + S₂* 'because S₁, S₂' or *suiran + S₁...danshi + S₂* 'althoughS₁, S₂', for example, the subject of S₁, but not its topic, is controlled by the subject of S₂, as shown in (6a-6c),respectively.

(6)a. yinwei PRO₁ mai le che, suoyi Lisi₁ you le qian.
      because PRO₁ sell ASP car, therefore Lee₁ have ASP money
      'Because (he₁) sold the car, Lee₁ got the money.'
  b. *yinwei [ₛ PRO₁, (ₛ Lisi mai le PRO₁)], suoyi che₁, cheng le zhangsan de
      because [ₛ PRO₁, (ₛ Lee sell ASP PRO₁)], therefore car₁, become ASP John's
     (Intended meaning) 'The car₁, because Lee sold it₁, it₁ became John's.'
  c. *suiran [ₛ PRO₁, (ₛ shangji xiafang PRO₁ daole nongchang)], danshi Lisi₁ hen gaoxing
      though [ₛ PRO₁, authorities demote PRO₁ to farm)], however Lee₁ very happy
     (Intended meaning) 'Lee, although the authorities demoted him to the farm, he was very happy.'

Compare (6c') with (6c) in acceptability, the subject status of the null pronominal in (6c') is obvious: backward binding of the topic in the subordinate clause is bad in (b-c), but (6c') and (6d) are acceptable. This argues for the subjecthood rather than the topichood of the pro in the subordinate clause in (6c') and (6d).

c'. suiran PRO₁ xiafang daole nongchang, danshi Lisi₁ hen gaoxing.
      though PRO₁ demote to farm, however Lee₁ very happy
      'Although he₁ was demoted to the farm, Lee was very happy.'
 d. suiran PRO₁ chuban le, danshi na ben shu₁ bu chuming.   (cf (1))
      though PRO₁ publish ASP, however that CL book₁ not famous
      'Although published, the book is not famous.'

1.6. Comp control. A subject, but not a topic, may be pro, if it is of a complememt clause and corefers to the subject of the main clause. In (8a), Lee, the subject of the sentential complement of 'hope' can be null and controlled by the main subject, but in (8b) the topic of the sentential complement 'Lee' cannot

(8)a. Lisi₁ xiwang (ₛ PRO₁ kanjin zhang-xiaojie).
   Lee₁ hope (ₛPRO₁ see Miss Zhang)
   'Lee hoped to see Miss Zhang.'
b. * Lisi₁ xiwang [ₛ· PRO₁ (ₛ zhang-xiaojie kanjin PRO₁)].
   Lee₁ hope [ₛ· PRO₁ (ₛ Miss Zhang see PRO₁)]
   (intended meaning) 'Lee₁ hoped that Miss Zhang saw him₁.'

The acceptability of (8c-8d) shows that in both complements, the pro controlled by the main subject is the complement's subject, not its topic. The transitive predicators *mai* 'bury' and *tisheng* 'promote' are actually passivized and have their theme-bearing arguments mapped to the subject of the sentential complement, which is controlled by the main subject in turn.

c. Lisi₁ xiwang PRO₁ si hou mai zai laojia.
   Lee₁ hope PRO₁ death after burry at hometown
   'Lee hopes to be buried at his hometown after death.'
d. Lisi₁ xiwang PRO₁ tisheng wei kezhang.
   Lee₁ hope PRO₁ promote as section-chief
   'Lee hopes to be promoted to be the section chief.'

1.7. Imperatives. The deleted 'you' in imperatives is the subject, not the topic. It is universal that imperatives have the understood subject 'you', which is also the case in Chinese(Li and Thompson 1981). The reflexive *ziji* is not specified for person or number. Yet, its unequivocal reading 'yourself' in (9a) and the ungrammaticality of (9b) caused by replacing the reflexive with a 2nd/SG pronoun shows that the deleted NP in imperatives is the subject 'you'.

(9)   a. Bie xiao-kan ziji.   b. *Bie xiao-kan ni.
           don't despise self   don't despise you
'Don't look down upon yourself (*himself/*myself)!'

The subject in imperatives is always the addressee regardless of the thematic role it bears. The imperatives in minimal pairs which contrast in voice between (a) and (b) in (10-11) have the underlying 'you' as agentive subject in (a), but as the theme subject in (b).

(10) {a. xiangqinmen / b. laodi} xuan ge xiang zhang {a zhu shi/ b. gangan} ba
{a. dear-folks/b. old brother} elect CL village chief {a. manage things/ b. do} PART
a. 'Dear folks! Elect someone as the village chief to take the responsibility!'
b. 'Old brother! Be elected as the village chief to have your way!'
(11) {a. xiaozhang/ b. haizi}! Baosong {a.wo erzi /b.∅} shang daxue gei wo zhengkouqi.
{a. schoolmaster/b. child}! Send {a. my son/b. ∅} go university give me honor
a. 'Schoolmaster! Send my son to a university to bring me the honor.'
b. 'Sonny! Be sent to a university to bring me the honor.'

Imperatives with predicators which, when in active voice, take the stationery or the edible as instrument subjects and human patients as objects such as *ban* 'trip' in (12a) and *cheng* 'cram the stomach of' in (12b) further prove that the human patients, after

the application of the passive rule, are assigned to be the passive predicators' subjects, since the two warnings in (12) are obviously addressed to a pedestrian or a friend at dinner table instead of, say, a tree stub or a pizza.

(12)a. liushen, bie ban zhao. b. shao chi, bie cheng zhao.
    watch-out, not trip ASP   little eat, not cram ASP
  'Watch out! Don't be tripped.'   'Eat a little a bit! Don't be crammed.'

1.8. Summary

The chart below sums up the contrastive responses of subject and topic to the eight tests, respectively. To all those tests, the sole preverbal NP bearing the theme/patient role responses like a subject, but to none of them does it response like a topic. Therefore, its subjecthood is proved and its topichood is falsified.

Tests GFs	Cleft	Q	Corefer to pro	Reflxv binding	ADJ control	subordinate clause	Comp control	Deletion in Imp.
SUBJ	+	+	−	+	+	+	+	+
TOPIC	−	−	+	−	−	−	−	−

2. Interaction between passivization and other morpholexical processes

2.1. Passivization and resultativization

In Chinese, two propositions in a cause-and-effect relation can be put into a single sentence like the following.

(13)a. wo quan le ta.   a'. ta zou le.   a''. wo quan-zou le ta.
    I advise ASP him   he leave ASP   I advise-leave ASP him
  'I persuaded him.'   'He left.'   'I persuaded him to go.'
  b. wo dou le ta.   b'. ta xiao le.   b''. wo dou-xiao le ta.
    I tease ASP him   he laugh ASP   I tease-laugh ASP him
  'I teased him.'   'He laughed.'   'I teased him to laugh.'

The verb sequences 'advise-leave' and 'tease-laugh' are called resultative compounds in literature (Thompson 1973). Resultative compounding is very productive in Chinese. It can be formalized as the following.

$$V_1 < \theta_i ... > + V_2 < \theta_j > \; --> [v_1 + v_2]V_3$$
'θ_i became the state denoted by v_2 as a result of $v_1$ing $<$theme$_i>$, if i = j'; or
'θ_i, by $v_1$ing, caused θ_j to be in the state denoted by v_2, otherwise.

The rule says that the compound derived from the morpholexical process can be either intransitive or transitive, depending on whether the two arguments subcategorized for by v_1 and v_2, respectively, are identical in reference or not. (13a'') and (13b'') examplify the transitive resultative compounds and (13c-d), the intransitive ones.

(13)c. ta zou-lei le.   d. ta chi-pang le.
    he walk-tired ASP   he eat-fat ASP
  'He walked himself tired '   'He ate himself fat.'

The evidence for a compound V_3 to be a lexical entry independent of v_1 and v_2, is 1) no aspect can be put between the two components of V_3, although both v_1 and v_2 can take aspect, when used as individual verbs; 2) the meaning of V_3 is different from the compositional meaning of v_1 and v_2 as shown in (13e-f'). In (13 e') and (f'), when v_1 and v_2 are individual verbs, it is not necessary that the action denoted by v_2 occured, whereas in (13e) and (13f), when v_1 and v_2 are components of the compound, it is necessary that the action enoted by v_2 did occur.

(13)e. wo quan-zou le ta, (*keshi ta mei zou).   e'. wo quan ta zou le, (keshi ta mei zou).
   I advise-leave ASP him but he not leave   I advise him leave ASP but he not leave
  'I persuaded him to go, (*but he didn't).   'I exhorted him to go, but he didn't.
  f. wo dou-xiao le ta, (*keshi ta mei xiao)   f'. wo dou ta xiao le, (keshi ta mei xiao).
   I tease-laugh ASP him but he not laugh   I tease him laugh ASP but he not laugh
  'I teased him to laugh, (*but he didn't).   'I teased him to laugh, but he didn't.

3) in coordination construction, if the coordinates each have their main predicator and complememt predicator in a sequence and if they have the same main predicator, the same verb can be deleted from its second mentioning on as shown in (14a), but if the coordinates have compounds as their predicators, even if the compounds have the same v_1 component, it can not be deleted as shown in (14b).

(14)a. ta xiang chi yurou, (xiang) chuan sichou, (xiang) zhu gaolou.
    he want eat fish-meat, (want) wear silk, (want) live building
   'He wants to eat good food, wear good clothes and live in a good house.'
  b. ta ku-hong le yanjing, */(ku)-ya le sangzi, */(ku) -jung le keren.
   he cry-red ASP eye */(cry)-hoarse ASP voice, */(cry)-embarrassed ASP guest
  'He cried so that his eyes got red, his voice became hoarse and the guest was embarrassed.'

The morpholexical nature of the resultative rule so proved, in turn, helps to prove the morpholexical nature of the passive rule. Since the passive rule feeds the resultative rule, as shown in (15), it has to be at the same level where the resultative rule applies. If resultative rule applies in the lexicon, it is impossible for the passive rule to be at the syntax or discourse level as so entailed by considering passive construction as topicalization.

(15)a. dayan chou-bai le jiaye.
    opium smoke-poor ASP family
   'Opium, by being smoked, made the family poor.'
  b. pangxie chi-huai le duzi.
    crab eat-sick ASP stomach
   'Crabs, by being eaten, made someone's stomach sick.'

The derivation of (15)

$$i. \quad smoke < agent_i \ patient_j >$$
$$\textbf{Passivization}$$
$$smoked < patient_j >$$
$$ii. \quad smoked < patient_j > \ + \ poor < theme_k >$$
$$\textbf{(Resultativization)}$$
$$smoked\text{-}poor < causer_j, \ causee_k >$$

2.2. Passivization and locative inversion

2.2.1. Locative inversion and subject postposing

Chinese locative phrases may be either PP or NP, depending on where they are in sentences. (The Chinese locative preposition is *zai*). For example

(16)a.pingguo */(zai) shu-shang zhang zhe. a'. pingguo zhang */(zai) shu-shang.
   apples */(PREP) tree-top grow ASP   apples grow */(PREP) tree-top
      'The apples grow on the tree.'   'The apples grow on the tree.'
a''. (zai) shu-shang zhang zhe pingguo.
   (PREP) tree-top grow ASP apples
      'On the tree grow apples.'

The locative phrases have to be PP, if the subject 'apples' stays preverbal as shown in (a-a'), but may be NP, if the subject is postposed as shown in (16a''). Since a locative phrase takes the form of an NP only when the subject is postposed, the acceptability of an locative NP indicates that the subject has been postposed.

2.2.2. Parallel IOC-invertibility of passivized transitives to intransitives

However, not all sentences with locative phrases can have their subjects postposed and, meanwhile, have the subject position filled up by the inverted locative in form of an NP. Transitive verbs cannot undergo locative inversion. For example

(16)b.xiaohai zai qiang-shang xie zhe (zi). b'. *qiang-shang xie zhe xiaohair (zi).
   child PREP wall-top write ASP (words)   wall-top write ASP child (words)
 'The child is writing (words) on the wall.' '*On the wall is writing(words) a child.'

Yet, the acceptable locative NP in (17a') indicates that passivized transitives like *xie* 'written' in (17a) may undergo locative inversion. The predicator *xie* 'written' in (17a-a') is the passive form of its homonymoys active form *xie* 'write' in (16b-b').

(17)a. zi zai qiang-shang xie zhe.   a'. qiang-shang xie zhe zi. (cf 16b')
   word PREP wall-top write ASP   wall-top write ASP word
 'Words are written on the wall.'   'On the wall are written words.'

Someone may suspect that *xie* in (17a') is still active and the difference between (16b) and (17a') is that the latter takes pro, but the former takes 'child', as their subjects, respectively. But if *xie* in (17a') were active with a null agentive subject, replacing it with an overt NP would be acceptable, which is not what we find in (17b).

(17)b. xiaohair */(zai) qiang-shang xie zhe zi. (cf 16b)
    child */(PREP) wall-top write ASP words
    'The child is writing (words) */on the wall.'

With the agentive subject 'child', the locative phrase has to be PP as in (16b), not NP as shown in (17b). What is more, the ambiguous (17c), in which 'the policeman' can be the subject either of the active *guan* 'keep' or of the passive *guan* 'kept', is no longer ambiguous, after it undergoes locative inversion in (17c'): 'the policeman' is the captive, not the jailer.

(17)c. jingcha guan zai wu-li.
  police keep LOC room-inside
 'The policeman is keeping (someone)in the room.'
or 'The policeman is kept in the room.'
c'. wu-li guan zhe jingcha
  room-inside keep ASP policeman
 'In the room was kept a policeman.'

The contrast between (16b') and (17a') in invertibility and the one between (17c) and (17c') in ambiguity confirm what Bresnan and Kanerva (1989) find about locative inversion in Chichewa: verbs whose expressed top thematic role is the theme/patient role undergo locative inversion, but verbs that have any expressed thematic role higher than the theme/patient role do not. Therefore, transitive verbs have to passivize so that their theme/patient role becomes the highest of the expressed roles, before they undergo locative inversion.

2.2.3. Subjecthood of the inverted locative phrase

In literature, the inverted LOC is considered as topic and the postposed NP, as subject (Li & Thompson). I need only to use the subject/topic verifying tests once more to show that in the LOC-inverted construction, the inverted LOC (rather than the postverbal NP) is the subject, not the topic.

i) **cleavability**: A subject can be cleft, but a topic cannot. The LOC NP can be cleft, but the postposed NP cannot, as shown in (18a-b) and (18a'-b'), respectively.

(18)a. Shi-wu-li zhan zhe ren.   a' wu-li zhan zhe (*shi)-ren.
 SHI-room-inside stand ASP person   room-inside stand ASP SHI-person
'It is in the room where a person stands.' '*In the room, it is a person who stands.'
b. Shi-wu-li fang zhe che.   b'. *wu-li fang zhe shi-che.
 SHI-room-inside put ASP bike   room-inside put ASP SHI-bike
'It is in the room where a bike is put.' '*In the room it is a bike that is placed.'

ii) **Questionability**: A subject can be questioned, but a topic cannot. The LOC NP can be questioned as shown in (19).

(19)a. nar zhan zhe ren?   b. nar fang zhe che?
 where stand ASP person   where put ASP bike
'Where does a person stand?'   'Where is the bike put?'

iii) **Adjunct control:** A subject, but not a topic, controls ADJs. The LOC NP controls the adjunct in (20a) and (20b') as does 'ten people' in (20a') and (20b). The unacceptability of (a') and (b') results from the mismatch between the subject 'people' and the adjunct 'to its full capacity', 'the room' and 'nervously'.

(20)a. wu-li (manmande) zhan zhe shi ge ren.
　　　room-inside (full-and-full) stand ASP ten CL person
　　'In the room, (to its full capacity), stand ten people.'
a'. shi ge ren (*manmande) zhan zai wu-li.
　　ten CL person (*full-and-full) stand LOC room-inside
　　'Ten people (*to its full capacity) stand in the room.'
b. shi ge ren (jinzhangde) zhan zai wu-li.
　　ten CL person (nervously) stand LOC room-inside
　　'Ten people (nervously) stand in the room.'
b'. wu-li (*jinzhangde) zhan zhe shi ge ren.
　　room-inside (*nervously) stand ASP ten CL person
　　'In the room, (*nervously), stand ten people.'

iv) **Subordination control:** A subject, but not a topic, may be pro, if it is of a subordinate clause and corefers to the subject of the main clause. The LOC, but not the postposed NP, in a subordinate clause is backward bound by the subject of the main clause as shown in the contrast between (21a-b) and (21 a'-b').

(21)a. *yinwei tai-shang zuo zhe PRO$_i$, suoyi zhuxituan$_i$ xiande hen zhongyao.
　　because rostrum-top sit ASP PRO$_i$, therefore presidium$_i$ appear very important
　　(intended meaning)'Sitting on the rostrum, the presidium look important.'
a'. yinwei PRO$_i$ zuo zhe zhuxituan, suoyi tai-shang$_i$ xiande hen yongji.
　　because PRO$_i$ sit ASP presidium, therefore rostrum-top$_i$ appear very crowded
　　(lit.)'Being sat-on by the presidium, the rostrum-top looks crowded.'
b. *yinwei chuang-shang$_i$ chang shui PRO$_j$, suoyi xiaohair$_j$ buxihuan dipu
　　because bed-surface often sleep PRO$_j$, therefore child$_j$ dislike sleep-on-floor
　　(intended meaning)'Because the child$_j$ often sleeps in bed, he$_j$ does not like to sleep on the floor.'
b'. yinwei PRO$_i$ chang shui xiaohair, suoyi chuang-shang$_i$ you henduo wanju.
　　because PRO$_i$ often sleep child, therefore bed-surface$_i$ has many toy
　　'Because in the bed often sleep children, it has many toys on it.'

2.2.4. Interaction among resultativization, passivization and loc-inversion

The sentences (23b-d) used to be considered as different versions of (23a), differing only in whether the locative PP or its object, the locative NP is being topicalized.

(23)a. wo zai qiang-shang tie le huar.　　　　b. zai qiang-shang, wo tie le huar.
　　I PREP wall-surface post ASP picture　　　　PREP wall-surface I post ASP picture
　　'I posted the picture on the wall.'　　　　'On the wall, I posted a picture.'
c. qiang-shang, wo zai nar tie le huar.　　　d. qiang-shang tie le huar.
wall-surface, I PREP there post ASP picture　　wall-surface post ASP picture
　　'The wall, I posted the picture on it.'　　　'On the wall is posted a picture.'

It should be clear by now that the locative phrase is the topic in (b-c), but not in (d)--
The verb in (23d) has undergone passivization and locative inversion so that the
locative NP there is the subject.

In Chinese, the obliques, the locative in (23) and the recipient in (24) can both be
topicalized by preposing, to the sentence-initial position, either the PP or its object NP
as shown in (b-c) in (23-24). If we considered the locative NP in (23d) as topic, we
would have difficuly accounting for the contrastive acceptability between (23d) and
(24d): if the locative NP in (23d) were the topic, why couldn't the recipient NP in (24d)
be the topic? If the NP in (23d) is considered as subject, (24d) poses no problem:
locative inversion applies to the passive verb 'posted' and makes 'wall-surface' the
subject, whereas it does not apply to 'told', since the verb does not subcategorize for
any locative role for the rule to apply.

(24)a. Wo gei xiaohai jiang le gushi.   b. Gei xiaohai, wo jiang le gushi.
    I to/for child tell ASP story   to/for child, I tell ASP story
       'I told the child a story.'   'To the child, I told a story.'
c. Xiaohai, wo gei ta jiang le gushi.   d. * Xiaohai jiang le gushi.
    child, I to/for him tell ASP story   child tell ASP story
    'The child, I told him a story.'   ('The child told the story to someone.')

Let me sum up this section by a demonstration of the interaction among
resultativization, passivization and locative inversion. Such an example is (26).

(26)a. shuini di-shang gui-teng le xiga.
  cement floor-surface kneel-painful ASP knees
'The knees hurt as a result of kneeling on the cement floor.'
b. huokang-shang shui-hao le guanjieyan
  heated bed-surface sleep-heal ASP arthritis
'Arthritis healed as a result of sleeping in a heated bed.'

The derivation of (26)

$$\text{i) kneel} < \text{theme}_i, \text{LOC}_j > + \text{painful} < \text{theme}_k >$$
$$\text{(resultativization)}$$
$$\text{kneel-painful} < \text{causer}_i, \text{causee}_k, \text{LOC}_j >$$

$$\text{ii) kneel-painful} < \text{causer}_i, \text{causee}_k, \text{LOC}_j >$$
$$\text{(passivization)}$$
$$\text{kneel-painful} < \text{causee}_k, \text{LOC}_j >$$

$$\text{iii) kneel-painful} < \text{causee}_k, \text{LOC}_j >$$
$$\text{(loc-inversion)}$$
$$\text{kneel-painful} < \text{causee}_k, \text{LOC}_j >$$
$$[+\sigma r_j]$$

3. Compounds

The homophony of Chinese active and passive verbs can be better seen in compounds,
since compounding takes place in the lexicon, where no topic or pro-drop is involved
yet for us to suspect that the homophony is an artifact of topicalization or pro-drop

Chinese compounds are mostly head-final: 'oil-vegetable' is a kind of vegetable not a kind of oil and 'vegetable-oil' is just the opposite. Similar pairs are 'chicken-meat' v.s. 'meat-chicken' (as opposed to 'egg-chicken', the one raised for eggs), 'dog-fish' v.s. 'wolf-dog' and 'egg-yellow(yolk)' v.s. 'yellow-grease(butter)'. Compound verbs are also head final 'fast-draw(sketch)', 'downward-put(demote)', 'together-sing(chorus)'. The compound nouns in (27) are of the same $[V + N]_N$ structure, the verb component being used as modifiers to the noun component. Yet, as shown in the English translation, the noun components in (a) are the agent of the verb components but those in (b), the theme/patient. In other words, take the first pair for example, the same gu means 'employing' in (a), but 'employed' in (b). It may be suspected that the noun components in (27) by themselves have voice specification and thus make further voice specification in verbs dispensable (since the agent/patient distinction may be encoded in the head component like the suffixes -er(-or)/ -ee in English words emplyor and employee). To show that the noun component is neutral in voice, we have the same noun component appear in both(a) and (b), there being three minimal pairs in each two, with the pattern of A + B, A + C, D + C, and D + E.

(27)

a.
A B	D C	A B	D C
gu zhu	jiao yuan	xuan min	lie shou
employ owner	teach person	elect people	hunt hand
'employer'	'teacher'	'voters'	'hunter'

b.
A C	D E	A C	D E
gu yuan	jiao cai	xuan shou	lie wu
employ person	teach material	elect hand	hunt stuff
'employee'	'textbook'	'champions'	'game'

a.
A B	D C	A B	D C
yang fu	zhi nu	kao guan	xue sheng
raise father	weave girl	test official	study youngster
'fosterfather'	'weaving goddess'	'test administrator'	'student'

b.
A C	D E	A C	D E
yang nu	zhi wu	kao sheng	xue ke
raise girl	weave stuff	test youngster	study subject
'fosterdaughter'	'textiles'	'test takers'	'subject'

a.
A B	D C	A B	D C
tiao fu	bao zi	zhu gong	lao tie
carry man	plane suff.	cast worker	bake/brand iron
'porter'	'carpenter plane'	'caster'	'a brand'

b.
A C	D E	A C	D E
tiao zi	bao hua	zhu tie	lao bing
carry suff.	plane flower	cast iron	bake/brand cake
'load'	'planedust'	'cast iron'	'pancake'

a.
A B	D C	A B	D C	D C
yong hu	shi ju	jian dao	shi zhi	geng niu
use household	eat instrument	cut knife	test paper	plough bull
'subscribers' or 'customers'	'cutlery'	'scissors'	'test paper'	'a draught bull'

b.
A C	D E	A C	D E	A C
yong ju	shi pin	jian zhi	geng di	yan niu
use instrument	eat stuff	cut paper	plough field	castrate bull
'tools'	'food'	'papercut'	'tillage'	'a castrated bull'

As is clear from the examples above: the noun component is neutral in voice and the verb component can be active or passive depending on individual compounds.

4. Conclusion

In this paper, I have shown that sentences whose predicators are otherwise transitive and whose sole preverbal NP bears the theme/patient role are passive. It has been a myth in literature that the sole preverb NP is the topic, not the subject, of the sentence. This is understandable, since the NP concerned does bear the GF of object in 'basic sentences' (Keenan, 1976) and there is no subject-verb agreement or case marking in Chinese to indicate its subjecthood. However, if topichood and subjecthood are defined in terms of their respective cross-linguistic properties instead of superficial, language-specific means by which they are encoded, the NP under investigation proves to be subject in all the tests to which subject and topic have opposite responses.

Having been taken for topicalization, the passive construction used to serve as main evidence for the topic prominence of the language (Li & Thompson 1975). Now that the topichood of the NP concerned is falsified, the same evidence leads to the opposite conclusion: Chinese is no less subject-prominent than those languages in which subjects are case marked and/or agree with predicators in number, person and gender-- a subject plays a central role in grammatical processes such as anaphora, imperative and control in Chinese as much as in other languages. So what is characteristic of Chinese is, instead of topic prominence, its meager morphology, which puzzles linguists by leveling off a lot of distinctions such as the distinction between active and passive voices as shown in this paper.

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Coordinate Ellipsis and the ECP
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This paper is taken primarily from Chapter Three of my dissertation which I defended this past summer at the University of Washington. In it I addressed two main topics, coordination and German syntax. The coordinate ellipsis types that I discuss here are also found in German in a very similar form, and therefore my analysis gains cross-linguistic support from this fact.

1. The ellipsis types

The ellipsis types that I will address in this paper have been popularly called Gapping, VP Ellipsis and Right Node Raising (RNR). A paradigmatic example of Gapping appears in (1):

(1)   Joe wrote a novel, and Jim e a poem

and an example of VP Ellipsis in (2a):

(2)a. Joe wrote a novel, but Jim didn't e

The central idea of my analysis will be that gaps seen in these constructions are properly governed and have their antecedents within the governing category as any anaphor does. Government in the ellipsis types in (1) and (2) comes from either a head within the elliptical conjunct, as in (2a), or from a previous conjunct, as in (1). Another form of VP ellipsis requires, as I will defend, a government relation as in Gapping; it is exemplified in constructions (2b) and (c):

(2)b. Joe wrote a novel, but not Jim e
     c. ?Joe wrote a novel, and Jim e, too

My judgment on (2c) can be explained by a comparison with (2a) or (b), both of which have an element with anaphoric properties in the elliptical conjunct which provides a clearer interpretation. If 'did' is inserted before 'too' in (2c), the construction is fully as acceptable as (2b) or (2a), but then it no longer fits into the category of Coordinate VP Ellipsis which, in my view, is defined by the government relation between the empty verb phrase and INFL in the previous conjunct; this inter-conjunctive relation is required simply because there is no eligible governor available in the elliptical conjunct. In (2b) this eligible governor is the auxiliary 'did'. I will assume that 'not' is not an eligible governor in (2b), and that the initial INFL must therefore govern the elliptical VP in that construction. This INFL in (2b) and (c) is not lexically realized, but it is a real syntactic position and an eligible governor because it is coindexed with the verbal head 'wrote'.

The notion of government in VP ellipsis of the sort in (2a) is taken from the 1986 Ph.D. dissertation of Lobeck. In her dissertation coordinate relations play no role. I wish to show here that in VP ellipsis of the sort in (2b), as well as in Gapping, a coordinate relation from a "full" conjunct to another is crucial to the acceptability of the ellipsis.

The third form of coordinate ellipsis is RNR. It is seen in constructions (3a) and (b):[1]

(3)a. Joe wrote well e, but Jim only poorly e, a biting letter to the editor
   b. Sue explained to the committee e, and the committee understood well e, that their would be no pay raises

RNR is somewhat unique amongst coordinate ellipsis types because it does not require a government relation from a full conjunct to an elliptical one. Rather, the elliptical head or phrase is governed by a head within the conjunct. RNR constructions must be classified as coordinate structures because interpretation of the gaps requires coordinate symmetry as seen in feature match-up. I will explain this principle in the forthcoming discussion.[2]

2. Coordination and ellipsis

The foregoing discussion of ellipsis types and proper government of gaps arises out of a notion of coordination which posits that elliptical constructions are generated without deletion, contrary to the approach in van Oirsouw 1987, for instance; empty categories or gaps arise from non-generation in the base.[3] Ellipsis in coordinate structures follows from the same principles that operate in non-elliptical, and even in non-coordinate, structures. This notion is in keeping with the principles and parameters approach of the Government-Binding framework. Just as government is crucial to an account of empty and lexical categories in simple sentences, so also is it important to an account of coordinate ellipsis. I wish to show with the remainder of this paper that coordinate structures are subject to the same principles as simple sentences, particularly in regard to ellipsis. The only unique property of coordination is symmetry, central to the notion of coordination. Stated simply, symmetry can be seen in the fact that most coordinate structures involve the coordination of like syntactic categories. However, a closer look at the data shows that cross-categorial coordination is easily possible, as in (4):

(4)   Joe is a Republican and very conservative

As studies have shown, the conjuncts of such coordinate structures share features which qualify them as symmetrical.[4] In my dissertation I stated the principle of "feature match-up" to capture the level of symmetry required by this and any other coordinate structure. Feature match-up results fundamentally from symmetrical semantic properties, not from syntactic symmetry, though syntactic symmetry generally follows.

The crucial role of semantic properties in coordination is also seen in coordinate ellipsis. In Gapping, for instance, there must be not only the government relation mentioned above, but also a balance or match-up of complements and modifiers, as seen in:

(5)a. Joe wrote a novel for his sister and Jim e a poem
   b. Joe wrote a novel for his sister and Jim e a poem for his mother
   c. *Joe wrote a novel for his sister and Jim e a poem in school

In (5a) 'for his sister' must be interpreted in the elliptical conjunct simply

because coordination requires symmetry; more precisely, it requires that the elliptical verbal head, properly governed by the initial verbal head, 'wrote', must inherit its modifier 'for his mother'. In other words, I assume every verbal head is assigned a theta grid as described in Stowell's 1981 MIT dissertation and assumed in studies like Wilkins 1988. The theta grid that I assume includes an index for modifiers, and it is transferred by feature match-up in Gapping constructions to the empty verbal head.

In (5c) we see that an elliptical clause may not contain a modifier which is non-symmetrical with a modifier in the full initial clause with which it is matched. The reason is clear: the index of the initial verbal head has been transferred, and any element which conflicts with this index creates unacceptability. The same principle operates in coordinate VP ellipsis whether the government of the elliptical VP comes from within or without the conjunct. Here, the lexical verb's maximal projection, VP, is transferred (by coindexation) to the elliptical conjunct, thereby disallowing the introduction of additional elements in the elliptical conjunct, as seen in (6):

(6)a. Joe wrote a novel for his sister, but Jim didn't e (*for his mother)
b. Joe wrote a novel about rats, and Jim too e (*about cats)

The role of feature match-up in coordinate ellipsis is to provide symmetrical interpretation. Feature match-up can be seen even in RNR which does not require maximal structural symmetry, as in:

(7)a. Jim knows e, and George has a good friend who surmises e, what the scoop is on the salary increase
b. Sue just met e, and Sally just proposed to a guy who knew intimately e, a woman famed for her surreal art
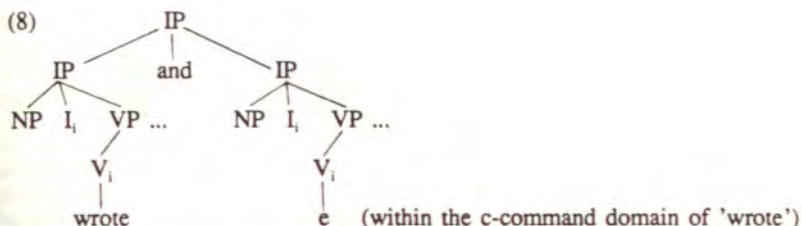
If we assume, as I do, that feature match-up takes place by feature percolation to the coordinate node, it is clear how these RNR constructions are subject to this principle even though the gaps are not structurally symmetrical.

There are therefore two crucial principles at work in coordinate ellipsis, government and feature match-up. Only the second is unique to coordination, and it can be described, on one level, as the symmetrical application of Θ-role assignment, necessary for coordinate structures. Seen this way, coordinate ellipsis requires no principles which are not required by simple sentences.

3. Why the ECP is applicable to coordinate ellipsis

The last major question we need to address is the relevance of the ECP to such cases of coordinate ellipsis.[5] To answer this question, we look more closely at the government relations I suggested for the three ellipsis types.

For Gapping I assume that the lexical verbal head in the initial conjunct c-commands the empty verbal head in the gapped conjunct. In other words, in my theory the category IP does not block this c-command relation, simply because the verbal head is coindexed with INFL, the source of its inflectional features, if any, and INFL is a verbal category. This relation is illustrated in (8):

(8)

```
                        IP
               _____|_____
              IP      and       IP
          ____|____         ____|____
        NP  I_i  VP ...    NP  I_i  VP ...
              \                   \
               V_i                 V_i
               |                   |
             wrote                 e    (within the c-command domain of 'wrote')
```

A relevant question at this point is: what does it mean that a verbal head c-commands an empty verbal category? The c-command relation, the basis of government here, is fundamental because only this relation enables the empty verbal head to govern its complements. In effect, the lexical verbal head is the governor for the complements of the elliptical verb. For this reason, intransitive verbs, having no complements, do not work well for gapping. Consider (9a) and (b) in comparison to (9c):

(9)a. ?Joe walked to the university today, and Jim yesterday
   b. *Joe walked to the university today because his brother had the car, and Jim yesterday
   c. Joe drove his car to the university today because his bike was broken, and Jim his new truck

(9a) is not as bad as (9b), I presume, simply because of the shorter linear distance between the verbal head 'walked' and the empty verbal head in the second conjunct.

Government by c-command is a prerequisite for Gapping, as (10) shows:
   (10)   *Joe wrote a novel [_CP however [_IP Jim e a poem]]

Whenever a blocking node arises, unacceptability results. CP is such a blocking node, not only for government in Gapping, but also in coordinate VP ellipsis whenever there is no available governor in the elliptical conjunct.

In Gapping and coordinate VP ellipsis, one verbal head always governs another; in RNR the category governed will most often be nominal, but it is possible for an entire IP or VP to be governed, as in (11a) and (b):

(11)a. Joe wondered in what respect e and Jim to what extent e each party would deal with the issues
   b. Joe hoped that the Republicans e and Jim that the Democrats e would dominate the debate

While it may seem natural to use the ECP in an explanation of nominal RNR gaps, can we argue that the ECP has relevance to the government relations I suggested earlier for Gapping and VP ellipsis and to those cases of RNR in which a non-nominal category is empty?[6] More specifically, what features do the empty categories have which make them subject to the ECP? Chomsky's 1982 definition of an empty category at least indirectly requires that the different types of empty categories be nominal. That is, the terms 'variable', 'anaphor', 'PRO', and 'pro' appear to apply in his algorithm only to nominal categories.

Must we conclude that the empty categories in coordinate ellipsis do not fall under Chomsky's algorithm, or can we claim that the feature specification [+anaphor] also applies to verbal categories? It is clear that the empty categories in Gapping and Coordinate VP Ellipsis are subject to at least one same constraint as nominal anaphors. In the examples of Gapping in (1) and (5) we see that in each case the empty category is bound within its governing category, given the government relations described earlier. The uniqueness of the relations in coordinate ellipsis can be described by the fact that the governing category and the empty category are not only structurally and semantically symmetrical but also categorially identical. Notice, however, that phonetic identity is **not** a requirement as illustrated in (12):[7]

(12)a. Joe has written many novels and Sue and Jill (have written) many poems
   b. Joe has written good novels, but not Sue and Jill (have written...)

Clearly, then, the gaps observed in Gapping and Coordinate VP Ellipsis are not recoverable by phonetic identity but by an underlying grammatical relation. Government, with the well-formedness constraint of coordinate symmetry, appears to be the principle involved.

To further illustrate the role of government here, we examine how (13) and (14) contrast with good cases of Gapping and Coordinate VP Ellipsis cited earlier:

(13)a. *Joe wrote a novel for his sister and Sue said [$_{CP}$ that Jim e for his brother]
   b. *Joe wrote a novel for his sister and [$_{CP}$ after that Jim e a poem for her]
(14)a. *Joe wrote a novel for his sister and Sue said [$_{CP}$ that Jim e too]
   b. *Joe wrote a novel for his sister but [$_{CP}$ after that not Jim e]

In each case the required c-command relation is blocked by a CP node; the lack of coordinate symmetry is one symptom of the lack of the required c-command relation. If one makes the two conjuncts symmetrical in respect to the fronted element in the embedded clause, acceptability does not result; in other words, symmetry alone is not sufficient for well-formedness; we see this fact in (15):

(15)a. *Last month Joe wrote a novel for his sister and after that Jim e a poem for her
   b. *Jill said that Joe wrote a novel for his sister and Sue (said) that Jim e too

The above data only suggest that the c-command relation must exist and that symmetry is not the source of interpretation but a reflection of coordinate well-formedness which has its basis in a coordinate government relation. The data do not prove, however, that the governing category contains the antecedent for the empty category. This fact is suggested by the constructions in (16); in each it is impossible to interpret the empty category by any other lexical item than the one which governs it and stands in coordinate symmetry with it:

(16)a. Joe wrote a novel for his sister because Sue researched the locale, and Jim e a lengthy article on butterflies
  b. Joe got lots of publicity from his book because Sue spent lots of time researching, and Jim e lots of cold cash

In both constructions the more linearly local verbal head is not necessarily the antecedent of the empty verbal head; the antecedent must be the head which is both able to c-command the empty verbal head and is symmetrical with it. If the embedded verbal head meets these criteria, as in (14b), then its relation with the empty verbal head in effect blocks out the same relation with the matrix verbal head. What we see is that where symmetry can be created in multiple ways as allowed by multiple c-command possibilities, non-syntactic factors such as intonation, semantic compatibility between parts to be interpreted symmetrically and possibly other factors as well will affect which interpretation is chosen, but in every good interpretation the antecedent must c-command the empty verbal head. Interpretation of a non-c-commanding verbal head as antecedent is not possible, as in (17):

(17) Because Sue spent lots of time researching, Joe got lots of publicity from his book and Jim e lots of cold cash

In (17) the adverbial clause no longer contains an eligible antecedent for the empty verb simply because the CP node which dominates it blocks this relation; the adverbial now has scope over the entire coordinate structure and the second conjunct can no longer be matched with it as a symmetrical embedded adverbial clause as in (16b). The construction illustrates how potential government relations in coordinate structures may be eliminated by a certain surface realization.

Coordinate constructions with multiple verbal heads and one empty one show that the interpretation of the latter cannot proceed unambiguously because of the eligibility of more than one verbal head as the antecedent; consider (18):

(18) Joe wrote a novel, Jim drafted a song and Sue e a poem

Both 'wrote' and 'drafted' have a c-command domain which extends to the empty verbal head. However, most speakers would tend to favor the linearly more local verb head as an antecedent if forced to interpret this construction. In that case the domain of 'drafted' appears to block the domain of 'wrote'. I will not pursue that question here.

In summary, the data show that empty categories in coordinate ellipsis fall within the c-command domain of a lexical verbal head. Where no c-command, and therefore no government, relation exists, interpretation cannot proceed. We are led to the suggestion, therefore, that empty verbal heads, when governed in this way, have anaphoric properties not unlike nominal categories. I find this no mystery, given the lexical index assigned to verbs in the form of a theta grid. This theta grid provides the interpretation of purely nominal and other at least partially nominal categories such as adjectives. The lexical category 'verb' allows, I believe, a complex of many properties; it is very possible, therefore to assign [+anaphor] to an empty verbal category,

properly governed by a lexical head of the same kind which thereby provides the necessary index for the empty head.

4. Other approaches

This approach to coordinate ellipsis is more appealing than others which require a more complicated grammar. An example of the latter is found in the 1987 dissertation of Chao. Her approach requires a "defective X' schema" that is "universally available" and therefore based on the assumption that a syntactic projection exists which is made up of H- heads, that is, lexically empty heads. Another approach which posits additional categories, thus complicating the grammar, is the GPSG approach using slash categories. Neither of these approaches treats Gapping or RNR as unique syntactic phenomena of coordination which they clearly are.

My aim here has been to make particular application to coordinate ellipsis of the principles which allow empty categories in simple sentences. In this way the obviously syntactic properties of coordination are given proper treatment and the grammar gains explanatory power and elegance.

Notes

1. Evidence whichs show that two gaps must be assumed, one in each conjunct, comes from data like:

(i) Jim believes that Sue, and George that (Mary, will /*Mary'll) be the fastest
(ii) The referee claims that we, and the fans that (they, are /*they're) up to bat first

2. This principle is central to my dissertation approach to coordination in general. My main motivation for it is the attempt to capture the semantic constraints on well-formedness in coordinate structures.

3. See Chao 1987 for another account of ellipsis which also assumes that gaps are a product of non-generation, but only through a set of phrase-structure rules reserved for ellipsis.

4. See Gazdar, et al. for one account.

5. For an account of across-the-board deletion which utilizes the ECP, see Woolford 1987.

6. Certain cases of RNR in German appear, in one analysis, to contain an empty V' category:

(i) Ilse schrieb ihrem Vater e und Erika ihrer Mutter e [ᵥ einen langen Brief über die Ferien [ᵥ e]]

7. Robert Ingria called to my attention that Gapping does not allow an empty verbal head to be interpreted with a different tense than its antecedent, but different number is acceptable, as the example in (12) shows. The reason, as he points out, is that tense but not number is a semantically significant feature, at least in constructions like Gapping which lack a lexical verbal head but contain all relevant subjects which determine verb number agreement. This fact supports the analysis of Gapping that I present here which draws on the theta grid of the verb as one source of constraints on Gapping.

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Tones from articulatory sources:
some historical data in search of an explanation[1]

Graham Thurgood

0.0 Introduction. An analysis of the historical evidence shows that certain discussed below have evolved in syllables starting with a voiceless consonant followed by a voiced consonant—clusters with mixed voicing. These conditioning factors are relatively straight-forward and uncontroversial. Thus, it is not the description of their conditioning factors which is of interest here; instead, the interest lies in why these conditioning factors had the effect they did. In a number of these cases, the origins must be explained in terms of the laryngeal adjustments necessary to accommodate the voicing conflicts in the onset.

1.0 Proto-Lolo-Burmese *3. All reconstructions of proto-Lolo-Burmese (=PLB), the larger subgroup within which Burmese is found, agree that three tones need be reconstructed for the non-stopped syllables. The first two tones are numerically quite common; the third tone, PLB *3, is restricted to about fifty words or so. It is the origins of this third tone PLB *3 and its Burmese reflex, the so-called Burmese 'creaky' tone[2], which are of interest; the oldest layer of creaky-toned words within Burmese are reflexes of the original fifty or so words with PLB *3.

	Written Tibetan	Written Burmese
'saddle'	sga	ká
'lean against'	snye-ba	ŋái; hŋái
'ripe'	smin-pa	hmáñ
'swell up; distend'	sbo-pa	pwá

Table 1:   Written Tibetan and Written Burmese.

In the examples of Table 1,[3] it is the tones not the initials that are of interest. Tibetan like Burmese is a Tibeto-Burman language but is outside the Lolo-Burmese subgroup.

The origins of Burmese creaky tone (and PLB *3) provide a clear example of a tone with articulatory origins. In terms of the historical conditioning factors, this tone evolved in non-stopped syllables beginning with an initial /s-/ followed by a voiced consonant. That is, this particular tone originated in phonetic combinations which can be schematically represented as syllables of the form *s-ga(N) [i.e., *s- +voiced consonant+vowel (+nasal)].

The argument for an articulatory origin. It is the creakiness of the reflexes not the statement of the conditioning factors that suggests an articulatory rather than an acoustic origin for the tone. The creakiness of the Burmese 'creaky' tone (and, in many cases, of PLB *3) is, as the name implies, creakiness, laryngealization, or vocal "fry".[4]

Where does this creakiness come from? All but one source can be ruled out. The creaky phonation is not inherited; extra-Lolo-Burmese languages show no evidence of creakiness. The creaky phonation is not the product of the loss of final stops; in only occurs in historically non-stopped syllables. The creaky phonation is not the product of the voiced consonant before the vowel; pre-vocalic voiced consonants correlate with the development of breathy rather than creaky phonation.

The origin must lie in the one potential source remaining: the creaky phonation must have originated in the laryngeal adjustments necessary to produce the initial consonant "cluster", that is, to produce an *s- followed by a voiced consonant. The laryngeal adjustments necessary to produce this type of 'cluster' also produced both the new tone (PLB *3) with its co-occurring phonation type.[5] The creaky phonation was just a by-product of the laryngeal adjustments which more importantly produced the new tone.

Intriguingly, the initial cluster itself did not survive, perhaps because it is articulatorily unstable.

2.0 Lisu (and Lahu) stopped tone reflexes. In this example, it is not the phonation features of the tone but its relationship to the other tone's in the tonal system that argue for its
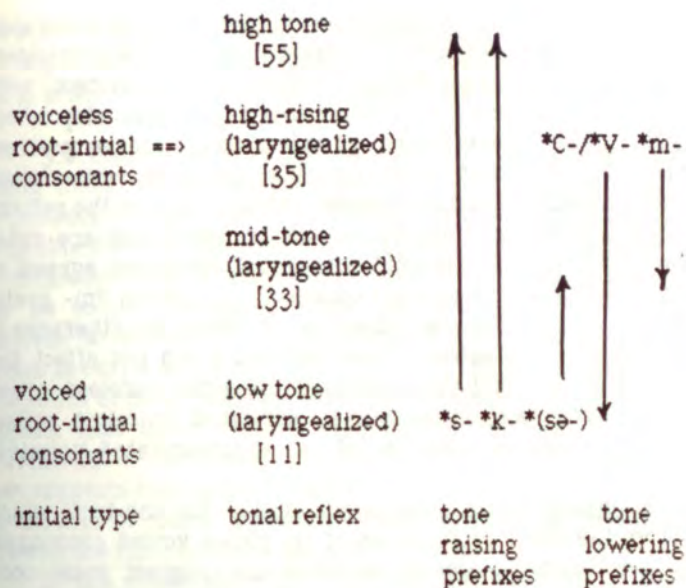
articulatory origins. Essentially, one of latter developing stopped tones of Lisu (and of closely-related Lahu) evolves from earlier lexical items of the form *sgak, where the initial consonant is an /s-/ and the following consonant is voiced.[6]

Since the relative chronology of the tonal developments is of interest, tables will be given to represent successive stages. In the first stage, the voicing of the consonant immediately before the vowel determined the tone class. This produced two tones, a high-rising tone [35 and laryngealized] and a low-tone [11 and laryngealized].

voiceless		high-rising
root-initial consonants	==============>	(laryngealized) [35][7]
voiced root-initial consonants	==============>[8]	low tone (laryngealized) [11]

Table 2.1a: Tones of Lisu root-initial consonants (Stage 1)

The evidence for this first stage where the initial tone assignment comes from the voicing of the root initial consonant without regard to the prefixes comes from examining the comparative data from related dialects. In all cases, at least one of the related dialects has modern reflexes which cannot be explained on the basis of any other assumption. Thus, in modern Akha the reflex of *m-pak syllables is high-toned with a voiced initial---the same tone as unprefixed voiceless initials; obviously, the tone assignment came from the voiceless initial before it voiced through interaction with the voiced *m- prefix. Again, in modern Akha the reflex of *s-bak syllables is low-toned with a voiceless initial---the same tone as unprefixed voiced initials; obviously, the tone assignment came from the voiced initial before it devoiced through interaction with the voiceless *s- prefix.

	high tone [55]		
voiceless root-initial ==> consonants	high-rising (laryngealized) [35]		*C-/*V- *m-
	mid-tone (laryngealized) [33]		
voiced root-initial consonants	low tone (laryngealized) [11]	*s- *k- *(sə-)	
initial type	tonal reflex	tone raising prefixes	tone lowering prefixes

Tone lowering prefixes:

*C- voiced stop
*V- vocalic
*m- nasal

Tone raising prefixes:

*s-   spirantal (older)
*(sə-) 'flesh' prefix (more recent)[9]
*k-   velar animal prefix (and other voiceless stops)

Table 2.1b: Voicing, prefixes, and tone height (Stage 2)

Similarly, in modern Lahu the reflex of *m-pak syllables is a high-abrupt tone with a voiced initial---the same tone as unprefixed voiceless initials; obviously, the tone assignment came from the voiceless initial before it voiced through interaction with the voiced *m- prefix.[10]

Interaction with prefixes brought about the emergence of the rest of the stopped tones. a. The presence of a voiceless prefix before a voiced root-initial introduced a voicing conflict into the

system, with the result that a number of low-toned words developed a higher tone. b. The presence of a voiced prefix before a voiceless root-initial also introduces a voicing conflict into the system, with the result that a number of high-rising toned words develop lower tones. In the most general terms, it shows that voiceless prefixes before voiced initials raised the tone class of the reflex, while voiced prefixes before voiceless initials lowered the tone class of the reflex.

Just as interesting (but not shown on the table) are cases where the prefix and the original root-initial consonant agreed in voicing; in these cases, nothing happened.   Thus, an *m- prefix before a voiced initial had no effect at all, tonal or otherwise.[11] Similarly, an *s- prefix before a voiceless initial did not affect the tone class, but it did affect the aspiration of the the voiceless initial; an unprefixed voiceless initial has an aspirated voiceless reflex, while an *s- prefixed voiceless initial has an unaspirated voiceless reflex.

The argument for an articulatory origin. For the tone which resulted from the onset combination of *s- plus a voiced consonant, there are two distinct pieces of evidence that suggest vocal cord involvement in the change. The first is the problem of getting an extra high tone from what the comparative evidence makes it clear was originally a low tone. Of course, if the assumption is made that this tone arose through the vocal cord articulation of the *s- + voiced consonant of the onset, its marked high pitch is simply the product of vocal cord tension and not particularly remarkable. However, if the tone is explained in terms of an acoustic "impression" left on the vowel by the preceding voiceless initial,[12] then the difficulty is to get the tone from low to high without merging with various other tones in between---some laryngealized and some not.

The other suggestion of vocal cord involvement in the origins is the apparent loss laryngealization on the vowel.   In modern Lisu, all the other reflexes of stopped syllables have laryngealization on the vowel[13] except those from the *s- + voiced consonant onset. There is no reason not to assume that these forms did not also have laryngealization prior to the tone formation. Thus, the apparent loss of this phonation feature suggests vocal cord involvement in the tone forming process.

The assumption is being made that the high pitch height and the loss of laryngealization are interrelated events.   Within the context of Southeast Asian tonal systems, it is extremely common to

find tones with co-occurring phonation types---in fact, it would not be completely misleading to say within the Southeast Asian context that is often what is meant by the term tone.[14]

3.0 Conclusion. In the data above, it is at least argued that certain tones originated in the vocal cord movements required for the production of consonantal onsets with mixed voicing. Perhaps the problem lies in the "conflicts" inherent in the timing involved in the transition from a voiceless to a voiced segment. That is, there may be some difficulty involved in making the transition from voiceless to voiced in a form such as *sga, where the voiceless portion is only a single segment long. In any case, the frequent co-occurrence of phonation type changes with the birth of tones at least suggests that tone birth is intimately involved with vocal cord adjustments.[15] In these cases, further analysis of three of these cases suggests that the tones arose in the physiology of the laryngeal articulation of these syllables, syllables with a voicing conflict between the consonants of the syllable onset.

If the some tones evolve from the vocal cord movements necessary for the production of consonantal[16] onsets with mixed voicing, can the analysis be pushed further? Certainly, the complete Lisu tonal system described above can be described fairly well in such terms (If you are curious, simply examine Tables 2.1a & 2.1b).

Endnotes:

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[1] I shall be astonished if all my errors should prove minor. I will be grateful to those who take the time and effort to point out both major and minor flaws. I freely acknowledge my lack of expertise in phonetics, but I have offered this speculation nonetheless in the hopes that it is not totally misguided and thus may be of use. I also wish to thank Ian Maddieson for discussion of some of this material.

[2] Although now there are now not fifty but around four hundred creaky-toned words in Modern Burmese, these additional forms are the result of various secondary developments within the history of Burmese itself (Thurgood 1977b, 1981) and are not of interest to us here.

[3]This table contains only a small fraction of the relevant data (for more data, see Thurgood 1981; 1976).

[4]Certainly, at least within the context of Southeast Asian languages, tones are often more than just a phonemicized pitch patterns. Indeed, what is referred to in the literature as a "tone" frequently also includes a co-occurring phonation type. (cf. Thurgood 1980).

[5]The creaky phonation of the so-called creaky tone of Burmese is not, impressionistically, as salient in modern Burmese as the tone's pitch features.

[6]For ease of explication, this is being presented largely in terms of its Lisu reflexes but in actuality this only part of the development of stopped syllable tonal reflexes in Loloish languages (see Matisoff 1972).

[7]Chao tone symbols. The highest pitch is 5; the lowest pitch is 1. The first number indicates the starting point; the last numbers indicates the end point.

[8]This arrow may be somewhat misleading. With voiceless root-initials, it may be the conflict between the articulation of the voiceless initial consonant and the following voiced vowel that leads to the high pitch. With voiced root-initials, it is not clear that any change at all occurs in the pitch of the following vowel; that is, there has been no change in the pitch of the following vowel.

[9]These two spirantal prefixes are reconstructed at different time depths. The *(sə-) is a recent reduction of a classifying morpheme still found in neighboring Akha.

[10]An alternate suggestion would be to propose that each language underwent tonogenesis independently. The comparative evidence, however, is clear on this point. The Loloish languages underwent one and the same two-way split at the Common Loloish stage; not only is the split typologically identical but more importantly it also includes exactly the same set of words.

[11]Obviously, then, no Lisu internal evidence exists for such prefixes. However, evidence for such prefixes exists in closely-related Lahu where a plain voiced initial devoiced except when it had been preceded by an *m- prefix.

[12]The chain would be *s-bak › *spak › *pa. The modern forms do, of course, have a voiceless initial so this aspect of the analysis is certainly accurate.

[13]With the exception of a small number of forms in the modern language with initial palatal affricates.

[14]It is also pertinent to note that phonation types and tones are not randomly correlated but that laryngealization tends to be associated with high tones, while breathy voice tends to be associated with low tones.

[15]Larry Hyman quite correctly described my analysis as "folk" phonetics—a characterization which I would not deny.

[16]Perhaps the "consonantal" could be dropped from the description.

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On The WH-Island Parameter.*

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0. Introduction

Rizzi (1980; 1982) has convincingly argued that in Italian, the bounding nodes for the Subjacency Condition of Chomsky (1973; 1977) are NP and S', whereas in English they are NP and S. This different choice is standardly known as the WH-Island Parameter since it crucially allows for apparent WH-Island Constraint violations in Italian-like languages, but not in English-like languages.

Rizzi's insight led Chomsky (1981) to the formulation of the rules under (1) and (2) and the characterization of clausal bounding nodes under (3):

(1) S' ---> (COMP) S
(2) COMP ---> [+, - WH], where [- WH] = *that* in English and equivalents in other languages (e.g. *que* in Spanish).
(3) a. S' is a bounding node in the context: ___ [+, - WH]
 b. S is a bounding node in the context: [+, - WH] ___
 c. S is a bounding node when governed.

In Chomsky's framework (1981), case (3c) distinguishes between raising and control structures, assuming S'-Deletion for raising predicates. The WH-Island Parameter involves (3b) and where (3b) does not hold, e.g. Italian, we have apparent WH-Island Constraint violations.

In this paper, I would like to explore another alternative that appears to be available as part of the WH-Island Parameter, namely that of doubly-filled COMPs, which Rizzi (1980; 1982) thoroughly discusses and dismisses in favor of the hypothesis that NP and S' are the bounding nodes in Italian. If Rizzi is indeed correct, I would like to suggest that (3b) is an option for languages that allow for singly-filled COMPs (the unmarked case), whereas languages that allow for doubly-filled COMPs, e.g. Spanish, make use of this property and permit a wider range of apparent violations of the WH-Island Constraint than Italian-like languages.

1. Doubly-filled COMPs in Spanish

In the view adopted in this paper, the doubly-filled COMP option is marked, which means that the language acquirer requires positive evidence for it in order to successfully construct or develop the relevant language-specific grammar. Such evidence is readily available in Spanish as the examples under (4) show:

(4) a. Te preguntan [(que) PARA QUE$_1$] quieres el préstamo e$_1$.

'They ask you [(that) for what purpose] you want the loan.
(They ask you what you want the loan for.)

b. Murmuró [(que) CON QUIEN$_1$] podía ir e$_1$.

'He asked-by-murmuring [(that) with whom] he could go.
(He asked, by murmuring, who he could go with.)

c. Pensó [(que) CUALES$_1$] e$_1$ serían adecuadas.

'He wondered [[that] which-ones] would be appropriate.'
(He wondered which ones would be appropriate.)

d. Repitió[(que) QUE LIBROS$_1$] querían comprar e$_1$.

'He asked again [(that) which books] they wanted to buy.'
(He asked again which books they wanted to buy.)

The examples under (4) are Rivero's (1980), who formalizes the rule of COMP expansion in Spanish, allowing for two COMP positions. I have placed the elements in COMP in brackets and indicated the optional presence of the complementizer *que* in parentheses. The stressed Q (= Question)-Phrase is in CAPs, a convention I will use throughout this paper to indicate that such a phrase is marked by a sharp raising-falling intonation pattern.

On the basis of evidence such as this, which positively marks Spanish as having the option of two positions in COMP, the language acquirer proceeds to construct a grammar that allows for all the relevant grammatical and ungrammatical constructions discussed by Rizzi (1980; 1982: 49-76), i.e. the language acquirer eventually develops full linguistic competence in Spanish, not Italian (or English).

3. The WH-Island Constraint

In Spanish, like in Italian, the WH-Island Constraint (cf. Ross (1967)) can be freely violated:

(5) a. [$_{NP}$ El encargo [$_{S'}$ que$_1$ [$_S$ no sabías [$_{S'}$ A QUIEN$_2$
[$_S$ confiarían e$_1$ e$_2$]]]]] te ha sido confiado precisamente a tí.
'The task that you didn't know to whom
they would entrust has been entrusted precisely to you.'

b. [$_{NP}$ Tu hermano, [$_{S'}$ a quien$_1$ [$_S$ me pregunto [$_{S'}$ QUE HISTORIAS$_2$
[$_S$ contarían e$_2$ e$_1$]]]]], estaba muy confundido.
'Your brother, to whom I wonder what stories
they told, was very confused.'

c. [$_{NP}$ La nueva idea de Jorge, [$_{S'}$ de la cual$_1$ [$_S$ me imagino
[$_S$ QUE COSAS$_2$ [$_S$ estarás pensando e$_2$ e$_1$]]]]],
pronto será de público dominio.
'Jorge's new idea, of which I imagine
what you are thinking,
will soon become known to everyone.'

Like in Rizzi's Italian data, these examples involve no resumptive pronoun and in all three instances a relative pronoun has been moved over an indirect question.

The claim that Spanish COMP has indeed two positions is confirmed by the grammaticality of the examples under (6):

(6) a. ¿Este es [$_{NP}$ el encargo [$_{S'}$ que$_1$ A QUIEN$_2$ [$_S$ no sabías
[$_{S'}$ que [$_S$ confiarían e$_1$ e$_2$]]]]] ?
'This is the task that to whom you didn't know
that they would entrust?'

b. ¿De modo que este es [$_{NP}$ tu hermano, [$_{S'}$ a quien$_2$ QUE HISTO-
RIAS$_1$ [$_S$ te preguntas [$_{S'}$ que [$_S$ contaron e$_2$ e$_1$]]]]]?
'So this is your brother to whom what sto-
ries you wonder they told?'

c. ¿Esta es [$_{NP}$ la nueva idea de Jorge [$_{S'}$ de la cual$_1$ QUE COSAS$_2$
[$_S$ te imaginas [$_{S'}$ que [$_S$ estoy pensando e$_2$ e$_1$]]]]]
'This is Jorge's new idea of which what
you imagine that I am thinking?

In the case of the examples under (6), both the relative pronoun and the Q-Phrase have been extracted from the most embedded S to the COMP position of the relative clause.

In principle, the examples under (5) can be analyzed á la Rizzi (1980; 1982) under the assumption that Spanish is like Italian with respect to its choice of S' (and not S) as a bounding node for Subjancecy. In the first cycle, the Q-Phrase moves from its extraction site to the innermost COMP--which is unproblematic in anyone's analysis--, and in the second cycle, the relative pronoun moves from its extraction site to the outer COMP over two Ss and one S'. Since S' and not S is assumed to be the bounding node for Subjacency, the examples are perfectly grammatical.[1]

However, since we know that Spanish allows for doubly-filled COMPs as examples (4) and (6) show, the following analysis of the examples under (5) is also possible: In the first cycle, both the relative pronoun and the Q-Phrase move--either simultaneously or one immediately after the other--to the innermost COMP and, in the second cycle, the relative pronoun moves to the outer COMP over one S and one S', leaving the Q-Phrase behind. Since according to the rules under (3) above only S' is bounding in the case of these examples, they are perfectly grammatical. Even the examples under (6) can be analyzed in this fashion once the fact that Spanish allows for doubly-filled COMPs is acknowkedged. Indeed, in the first cycle, both the relative pronoun and the Q-Phrase move--either simultaneously or one immediately after the other--to the innermost COMP and from there to the outer COMP over one S and one S', in the second cycle, with no violation of the Subjacency Condition.

Another alternative is that neither S nor S' are bounding and that the Subjacency Condition simply does not hold in Spanish. However, Spanish--like Italian--obeys the Complex NP Constraint of Ross (1967), which has been subsumed under the terms of the Subjacency Condition (cf. Chomsky (1973; 1977)):

(7) a. *[$_{NP}$ Este encargo [$_{S'}$ que$_1$ [$_S$ no sabía [$_{NP}$ la noticia

[$_{S'}$ e$_1$ que [$_S$ te habían confiado e$_1$]]]]]] ...

'This task that I didn't know the news that they had entrusted you...'

b. *[$_{NP}$ Tu hermano, [$_{S'}$ a quien$_1$ [$_S$ temo [$_{NP}$ la posibilidad

[$_{S'}$ e$_1$ que [$_S$ hayan contado todo e$_1$]]]]]] ...

'Your brother, to whom I am afraid of the possibility that they have told everything...'

c. *[$_{NP}$ La nueva idea de Jorge [$_{S'}$ de la cual$_1$ [$_S$ facilmente me
imagino [$_{NP}$ la eventualidad [$_{S'}$ e$_1$ que
[$_S$ Pedro tenga una idea negativa e$_1$]]]]]] ...
'Jorge's new idea, of which I easily imagine the event that
Pedro has a negative opinion...'

Given the ungrammaticality of the examples under (7), at least NP
and S' must be bounding nodes for Subjacency effects in Spanish.

4. The Predictions of the Doubly-filled COMP Hypothesis

Let us now examine the consequences of the doubly-filled COMP
hypothesis vis-á-vis those of Rizzi's approach. Consider examples (8),
(9), and (10):

(8) a. Realmente no sé [$_{S'}$ QUIEN$_1$ [$_S$ e$_1$ puede haber adivinado
[$_{S'}$ A QUIEN$_2$ [confiaríamos **este encargo** e$_2$]]]]
'I really do not know who could have guessed
to whom we would entrust this task.'
b. **Este encargo**, [$_{S'}$ **que**$_1$ [$_S$ realmente no sé
[$_{S'}$ QUIEN$_2$ [$_S$ e$_2$ puede haber adivinado
[$_{S'}$ A QUIEN$_3$ [$_S$ confiaríamos **e**$_1$ e$_3$]]]]]]],
me está creando un saco de problemas.
'This task which I really do not know
who could have guessed
to whom we would entrust
is creating lots of problems for me.'
(9) a. Realmente no imagino [$_{S'}$ CUANTA GENTE$_1$ [$_S$ e$_1$ sabe
[$_{S'}$ A DONDE$_2$ [$_S$ van enviar **esta chica** e$_2$]]]]
'I really cannot imagine how many people know
where they are going to send this girl.'
b. **Esta chica**, [$_{S'}$ **que**$_1$ [$_S$ realmente no imagino
[$_{S'}$ CUANTA GENTE$_2$ [$_S$ e$_2$ sabe
[$_{S'}$ A DONDE$_3$ [$_S$ van a enviar **e**$_1$ e$_3$]]]]]]],
está absolutamente desesperada.
'This girl, who I really cannot imagine
how many people know
where they are going to send, is absolutely desperate.'

(10) a. Me pregunto [$_{S'}$ A QUIEN$_1$ [$_S$ podría consultar e$_1$

[$_{S'}$ CUANDO$_2$ [$_S$ hablaré sobre **este tema** e$_2$]]]]

'I wonder who I could ask

when I must talk about this topic.'

b. **Este tema,** [$_{S'}$ **sobre el cual**$_1$ [$_S$ me pregunto

[$_{S'}$ A QUIEN$_2$ [$_S$ podría consultar e$_2$

[$_{S'}$ CUANDO$_3$ [$_S$ hablaré **e$_1$** e$_3$]]]]]],

me tiene sin cuidado.

This topic, about which I wonder

who I could ask

when I must talk,

doesn't really worry me.

In Italian, all (b) examples are ungrammatical since they involve relativization of the the NP in bold face in the (a) examples, over two S' with their COMPs filled by a Q-Phrase. However, all (b) examples are perfectly grammatical in Spanish. One possible explanation for the Spanish facts would be that S' is not a bounding node or that Subjacency simply does not hold in the language. Nevertheless, this possibility is out given the ungrammaticality of the examples under (7), which can only be explained in terms of Subjacency and the bounding nature of S'. Thus, the only possible explanation for the grammatical status of the Spanish examples under (8b), (9b) and (10b) is the one provided by the doubly-filled COMP hypothesis. Let us consider the derivation of example (8b). In the first cycle, the relative pronoun *que* and the Q-Phrase *a quién* move--either simultaneously or one immediately after the other--to the innermost COMP. In the second cycle, the relative pronoun *que* moves to the intermediate COMP (leaving the Q-Phrase *a quién* behind) and the Q-Phrase *quién,* which belongs to the intermediate S, also moves to the intermediate COMP. Finally, in the third cycle, the relative pronoun *que* moves to the outer COMP. In this analysis, the relative pronoun *que* climbs from COMP-to-COMP in a successive cyclic manner until it reaches the outer COMP, leaving behind in each step the relevant Q-Phrases.

Although the doubly-filled COMP hypothesis opens a Pandora's box with respect to WH-Movement in Spanish, specifically regarding the conditions under which doubly-filled COMPs are possible at S/Structure, the evidence examined in this paper indicates that it is

the only possible explanation for the grammaticality of examples such as (4), (6), (8b), (9b), and (10b), assuming that S' is a bounding node for Subjacency in the language. However one question remains as far as the Subjacency Condition is concernd, namely whether S is also bounding or not. The simplest possible assumption is that it is, i.e. that both S' and S are bounding for Subjacency effects, since the parametric variation observable in the language as far as the WH-Island Constraint is concerned does not depend on the choice of S' or S as bounding nodes, but rather on the possibility of having a doubly-filled COMP, as argued above. The examples under (11) show that this is precisely the case:

(11) a. ¡Yo no sabía [$_{S'}$ QUE REGALOS$_1$ [$_S$ te preguntabas
        [$_{S'}$ DONDE$_2$ [$_S$ dejaríamos e$_1$ e$_2$ **a estos chicos**]]]]!
        'I didn't know what presents you were-wondering
        where we would leave for these kids!'

    b. *Aquí están **estos chicos** [$_{S'}$ **a quienes**$_1$ [$_S$ yo no sabía
        [$_{S'}$ QUE REGALOS$_2$ [$_S$ te preguntabas
        [$_{S'}$ DONDE [$_S$ dejaríamos e$_2$ e$_3$ **e$_1$**]]]]]].
        'Here are these kids to whom I didn't know
        what presents you were-wondering where we would leave.'

The (b) example involves relativization of the NP in bold face in the (a) example. In the first cycle, the Q-Phrases *qué regalos* and *dónde* move to the innermost COMP. In the second cycle there are several possibilities: If the Q-Phrase *qué regalos* moves to the intermediate COMP first and the relative pronoun *a quienes* moves to the innermost COMP next, we have a violation of the strict cycle condition (cf. Chomsky (1973)). If the relative pronoun *a quienes* moves directly to the outer COMP, it crosses over two S' with their respective COMPs filled by a Q-Phrase, and we have a violation of the Subjancy Condition. If the relative pronoun *a quienes* moves in the second cycle to the intermediate COMP before que Q-Phrase *qué regalos,* crossing over the innermost S and S', which are in the environment [+WH]_____ and _____[+WH] respectively, there shouldn't be any problem, and it should be able to proceed to the outmost COMP after the Q-Phrase *qué regalos* has moved to the intermediate COMP, provided that S is not a bounding node in the environment [+WH]_____ Since in this case the structure should be grammatical but the actual

example is not, we must conclude that a violation of the Subjancency Condition is involved and that both S' and S are bounding nodes in Spanish, as per the terms of the rules under (3) above.[2]

5. Conclusion

In this paper I examined some Spanish examples involving WH-Island Constraint violations and concluded that they are to be attributed to the doubly-filled COMP property, which must be part of the WH-Island Parameter. In the view advanced here, the WH-Island Parameter involves either singly-filled or doubly filled COMPs, which allows for English and Italian-like languages on the one hand, and Spanish-like languages on the other. Given the singly-filled COMP option, languages may choose S as a bounding node for Subjacency or not, which accounts for the differences observable in the case of English and Italian, as discussed by Chomsky (1981). In the case of languages that make use of the doubly-filled COMP option, both S' and S are bounding for Subjacency effects. Thus, the Wh-Island Parameter can be expressed as in (12) below:

(12) The Wh-Island Parameter:

    A. Singly-filled COMP option:
      a. S' is a bounding node in the environment: ___[+WH]
      b. S is a bounding node in the environment: [+WH___

      Where (b) does not hold, we have apparent violations of
      the WH-Island Condition, e.g. Italian.

    B. Doubly-filled COMP option: both S' and S are bounding
      nodes in the environments ___[+WH] and [+WH]___,
      respectively, e.g. Spanish.

ENDNOTES

1. An alternative approach is that of Adams (1984/85). However, given the terms of her proposal, (8b) in the main text should be ungrammatical since the trace in the innermost COMP wouldn't be antecedent governed as she requires, i.e. the trace bearing the same index in the next COMP does not c-command the trace in the innermost COMP (cf. Adams (1984/85) for the details of her approach). The following is the relevant analysis of (8b):

(1) ... encargo$_1$ [que$_1$ [... [**t$_1$** QUIEN$_2$ [t$_2$ ... [**t$_1$** A QUIEN $_3$ [... t$_1$ t$_3$ ...

The fact that (8b) is grammatical does not make Adams' approach (1984/85) extendable to Spanish.

2. As far as the Subject Condition is concerned, it holds if the subject is in preverbal position but not if the subject is postverbal. Thus, (ia) below constitutes further evidence that S is a bounding node in Spanish. If it was not, the extraction from the subject NP in preverbal position should be possible over S, as in Italian, where S is not bounding (cf. Rizzi (1980; 1982)).

(i) a. *De qué$_1$ dijiste [que t$_1$ [$_S$ [$_{NP}$ una botella t$_1$]
　　 te cayó en la cabeza]]?
　 b. De qué$_1$ dijiste [$_{S'}$ que t$_1$ [S t$_1$ [$_{VP}$ te cayó [$_{NP}$ una botella t$_1$]
　　 en la cabeza]]]?
　　 'Of what did you say a bottle fell on your head?'

Interestingly enough, (ib) constitutes evidence that postverbal subjects are under VP in Spanish, as argued in Contreras (1982) and Westphal (1986).

The ungrammaticality of (ia) is certainly not a consequence of verb preposing/subject-verb inversion due to WH-Movement since this does not mandatorily trigger such a process contrary to Torrego (1984):

(ii) Qué$_1$ dijiste [que [Pedro le trajo t$_1$ a María]]?
　　 'What did-you-say that Pedro brought for Mary?'

Thus, the only possible explanation for the ungrammaticality of (ia) is that it involves a violation of Subjacency, i.e. S and NP are bounding nodes in Spanish.

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HALF-LINES AND THE TONE STRUCTURE OF CHINESE REGULATED VERSE [1]

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1. INTRODUCTION

In the framework of Liberman and Prince (1977), Chen (1979) observes that the tone structure in Chinese regulated verse lines is hierarchically organized: a verse line is divided into half-lines which in turn are divided into feet. Yip (1980) confirms Chen's observation with further arguments, while presenting somewhat different labeling rules. However, half-lines have been justified largely from recitation facts and syntactic division. Half-lines are not truely recognized as independent prosodic categories in their analyses. As a result, in actual treatment of the tone structure either a special condition is needed (see Chen) or heptasyllabic and pentasyllabic lines must be treated separately (see Yip). In this paper, I shall offer evidence on a phonological basis to show that half-lines as well as metrical feet are independent prosodic categories in Chinese regulated verse. I argue that specifying the independent status of half-lines is consistent with the claim that the tone structure of Chinese regulated verse is phonologically hierarchical, and consequently allows for a unified and straightforward account of the hierarchy.

2. CHINESE REGULATED VERSE AND PREVIOUS ANALYSES

Chinese regulated verse has a highly formalized character. Assuming E and O stand for even tone and oblique tone respectively, the basic canonical tone patterns are shown in (1). [2]

(1)   a.   Heptasyllabic A   Pentasyllabic A

1.	O	O	E	E	E	O	O		1.		E	E	E	O	O
2.	E	E	O	O	O	E	E		2.		O	O	O	E	E
3.	E	E	O	O	E	E	O		3.		O	O	E	E	O
4.	O	O	E	E	O	O	E		4.		E	E	O	O	E
5.	O	O	E	E	E	O	O		5.		E	E	E	O	O
6.	E	E	O	O	O	E	E		6.		O	O	O	E	E
7.	E	E	O	O	E	E	O		7.		O	O	E	E	O
8.	O	O	E	E	O	O	E		8.		E	E	O	O	E

---

[1] I wish to thank Dawn Bates for her helpful comments and suggestions.

[2] In poetry, the four Chinese tones are divided into two general tone categories, even and oblique. See Wang (1957) and Chen (1979) for the data and related discussions.

(1) b.   Heptasyllabic B   Pentasyllabic B

1.	E E O O E E O	1. O O E E O
2.	O O E E O O E	2. E E O O E
3.	O O E E E O O	3. E E E O O
4.	E E O O O E E	4. O O O E E
5.	E E O O E E O	5. O O E E O
6.	O O E E O O E	6. E E O O E
7.	O O E E E O O	7. E E E O O
8.	E E O O O E E	8. O O O E E

As we may have noticed, actually only eight verse lines are permitted: four for heptasyllabic verses and four for pentasyllabic verses:

(2)   Heptasyllabic   Pentasyllabic

O O E E E O O	E E E O O
E E O O O E E	O O O E E
E E O O E E O	O O E E O
O O E E O O E	E E O O E

Chen (1979) proposes an analysis, demonstrating that these tone patterns could be best accounted for in terms of a binary hierarchy. The basic rules Chen proposes are shown in (3):

(3) a. Hierarchical Structure
A metrical line is hierachically structured with exclusively binary branchings. The second half-line can be either right-(R) or left-branching (L).
b. Tone Assignment
Opposite tones (T and T') are assigned to sister constituents down to the level of the metrical foot in this fashion:

$$T \longrightarrow T' \quad T \; ; \qquad\qquad T' \longrightarrow T \quad T'$$
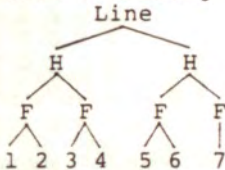
c. Tone Specification
T may assume the value of either E or O, and T' is opposite to T, subject to the Tonotactic Condition.
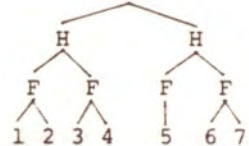d. Tonotactic Condition
If Tone Assignment produces four consecutive syllables carrying an identical tone, the tones of the second half-line undergo alpha-switching (E to O, and vice versa).

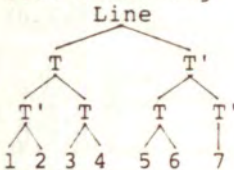The structures in (4) are examples of the derivation for heptasyllabic lines.[3]
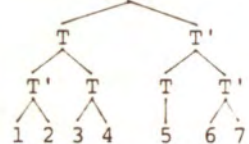
(4) a. Hierarchical Structure

Left-branching Line

```
        H               H
      F   F           F   F
     /\  /\          /\   |
    1 2 3 4         5 6   7
```
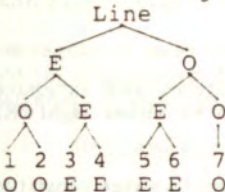
Right-branching Line

```
        H               H
      F   F           F   F
     /\  /\          |   /\
    1 2 3 4         5   6 7
```

b. Tone Assignment

Left-branching Line

```
        T               T'
     T'  T           T   T'
    /\  /\          /\   |
    1 2 3 4         5 6   7
```

Right-branching Line

```
        T               T'
     T'  T           T   T'
    /\  /\          |   /\
    1 2 3 4         5   6 7
```

c. Tone Specification

Left-branching Line

```
        E               O
     O   E           E   O
    /\  /\          /\   |
    1 2 3 4         5 6   7
    O O E E         E E   O
```

Right-branching Line

```
        E               O
     O   E           E   O
    /\  /\          |   /\
    1 2 3 4         5   6 7
    O O E E         E   O O
```
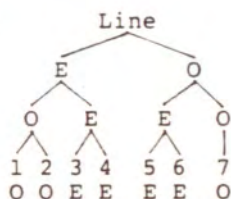
In the structures, H stands for a half-line and F stands for a metrical foot. In Chen's analysis, well-formed structures, as shown in (4c), result from the right-branching structures after the application of the Tone Specification but not from the left-branching structures, where patterns with four consecutive syllables carrying the same tone are produced. Thus, a left-branching structure needs to be readjusted by the Tonotactic Condition as shown in (5).

---

[3] Derivations for pentasyllabic lines are exactly in the same fashion.

(5) a.

```
              Line
         ┌─────┴─────┐
         E           O
        ╱╲          ╱╲
       O  E       E   O
      ╱╲ ╱╲      ╱╲   │
      1 2 3 4    5 6   7
      O O E E    E E   O
```

b.

```
              Line
         ┌─────┴─────┐
         E           E
        ╱╲          ╱╲
       O  E       O   E
      ╱╲ ╱╲      ╱╲   │
      1 2 3 4    5 6   7
      O O E E    O O   E
```
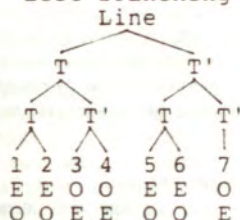
----->
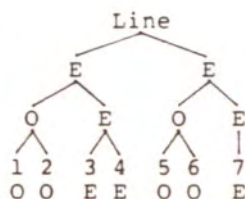
To reject Chen's treatment in terms of the Tonotactic Condition and to relate tone assignment directly to the metrical tree, Yip (1980) treat heptasyllabic and pentasyllabic verse lines with two labeling rules:
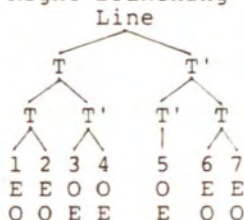
(6) a. Labeling Convention 1   (for heptasyllabic lines)
In a pair of sister nodes N_1 N_2, N_1 is labeled T if and only if it branches.

Left-branching Line

```
              T
         ┌────┴────┐
         T         T'
        ╱╲        ╱╲
       T  T'     T   T'
      ╱╲ ╱╲     ╱╲   │
      1 2 3 4   5 6   7
      E E O O   E E   O
      O O E E   O O   E
```

Right-branching Line

```
              T
         ┌────┴────┐
         T         T'
        ╱╲        ╱╲
       T  T'     T'   T
      ╱╲ ╱╲     │    ╱╲
      1 2 3 4   5   6 7
      E E O O   O   E E
      O O E E   E   O O
```

b. Labeling Convention 2   (for pentasyllabic lines)
In a pair of sister nodes N_1 N_2, N_2 is labeled T if and only if it branches.
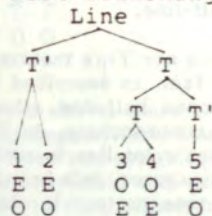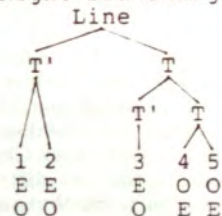
Left-branching Line

```
        T'         T
        ╱╲        ╱╲
       │  │     T    T'
       1  2    ╱╲   │
       E  E    3 4   5
       O  O    O O   E
               E E   O
```

Right-branching Line

```
        T'          T
       ╱╲        ┌──┴──┐
       │ │      T'      T
       1 2      │      ╱╲
       E E      3     4 5
       O O      E     O O
                O     E E
```
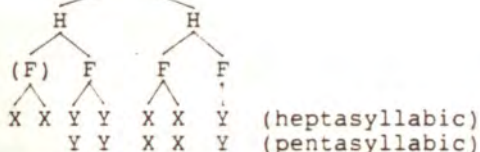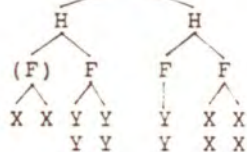
3. FURTHER GENERALIZATIONS

Consider now the structures in (7), which, as shown in Chen (1979), uniformly represent the tone patterns of both heptasyllabic and pentasyllabic verse lines:

(7) Left-branching   Right-branching
         Line   Line

```
       H         H                H         H
      /\        /\               /\        /\
   (F)  F     F    F          (F)  F      F    F
   /\  /\    /\    |          /\  /\      |   /\
  X X Y Y   X X    Y  (heptasyllabic)  X X Y Y   Y   X X
      Y Y   X X    Y  (pentasyllabic)      Y Y   Y   X X
```

In the structures, X and Y are distinct variables. In terms of tone specification, X and Y may assume as their values either E or O as long as one is opposite to the other. Obviously, alternating between the two values, only four possible lines are to be generated for heptasyllabic verses and four for pentasyllabic verses. They are just all and only those permitted verse lines. Given the representations in (7), descriptive generalizations include apparently:

(8) a. Syllables within a foot have the same tone.
    b. Two sister feet, namely, the feet within the same half-line, always have opposite tones.
    c. The two adjacent non-sister feet, that is, the second foot in the first half-line and the first foot in the second half-line, have the same tone if and only if the first foot in the second half-line is monosyllabic; otherwise, they have opposite tones.
    d. The tone pattern of a heptasyllabic line is exactly like that of a corresponding pentasyllabic line except that a heptasyllabic line has one more foot prefixed in the first half-line.

It should be noted that neither Chen's nor Yip's treatment captures all these generalizations. Chen ignores the fact, as described in (8c), that the tone value of the first foot in the second half-line alternates crucially according to whether it is branching or nonbranching. As Yip (1980) notes, the problem with Chen's tone assignment rules lies in assigning the same tone to the two different underlying structures, left-branching and right-branching. Further, although a desired tone pattern is obtained after the application of the Tonotactic Condition, the readjusted structure is not well-formed, because sister nodes, namely, half-lines, have the same value (see the structure in (5b) above). As is well known, the essence of metrical phonology is relative "prominence", and a universal principle of metrical phonology independently disallows structures like those in (9).

(9)   *   /\   *   /\

                  E   E   O   O
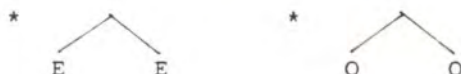
Yip's analysis relates the tone alternations directly to metrical structures. But it is not quite right that heptasyllabic and pentasyllabic verse lines are generated by two separate rules, since there is a systematic correspondence between them. Yip fails to capture the generalization between heptasyllabic and pentasyllabic verse lines, described in (8d). Any analysis which has systematic exceptions or misses systematic phenomena with respect to the object in question cannot be an optimal treatment.

4. HALF-LINES ARE INDEPENDENT PROSODIC CATEGORIES

Assuming half-lines as independent prosodic categories may appear odd and farfetched at first sight. But with a close observation, we can see that this is a correct assumption. As we have seen, the relation between two adjacent feet is not always the same. The first and second feet always have opposite tones and so do the third and fourth feet, but this is not true of the second and third feet. They carry the same tone if and only if the third foot is monosyllabic, otherwise, they have opposite tones. Remember that the third and fourth feet always have opposite tones even though one of them is monosyllabic. Given a hierarchical representation, it becomes apparent that adjacent feet within a half-line must have opposite tones, while the two adjacent feet across half-lines are not thus constrained. Clearly, half-lines are prosodic units with intrinsic content. [4]

Wang (1957) in his influential work on Chinese versification shows that both heptasyllabic and pentasyllabic lines can be derived from two basic schemes, which could be depicted as follows:

(10) a. (/\ ) E E   E↙↘ O O   b. (/\ ) O O   O↙↘ E E

       O O   E E
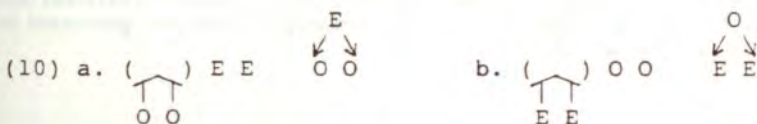
In the schemes above, there are four basic syllables, arranged in contrasting pairs. For heptasyllabic lines, add two syllables with a tone opposite to that of the first two syllables to the position denoted by the parenthesis. For both heptasyllabic and pentasyllabic lines, add a syllable carrying a tone opposite to that, either at the left or right side, of the last two syllables. These schemes offer an elegant and insightful description of all and

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[4] The independent status of feet is obvious since they are tone-bearing units. See Chen (1979) for detailed discussion.

only the permissible lines for both heptasyllabic and pentasyllabic verses. Note that if we use variables instead of actual tone values, assuming distinct variables always carry opposite tones, the two schemes immediately collapse into one form:

(11)

$$(\overbrace{}) \quad Y \quad Y \qquad \overset{Y}{\underset{X\ X}{\swarrow\ \searrow}}$$

$$\underset{X\ X}{}$$
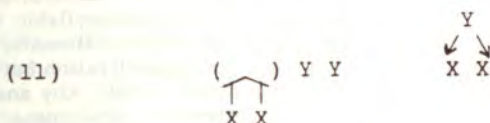
Wang's (1957) analysis, though not hierarchical, implies the independent status of half-lines. Wang divides the four basic syllables into two subgroups, distinct from each other in terms of tone. Relevant rules, such as adding syllables, further apply within each group. The notion of subgroups in effect suggests the notion of half-lines. Wang's idea is interesting because it indicates that half-lines are potentially distinct in terms of tone although the tone is not directly assigned to them. This just reflects the idea of labeling. In the present case, labels are not symbols of tones, but the features which are potentially related to tones and may only be associated with tones at a particular level, i.e. the foot level. Wang's analysis is important because it provides independent evidence for the existance of half-lines as prosodic categories. Most unfortunately, Chen dismisses Wang as descriptive and linear without paying much attention.
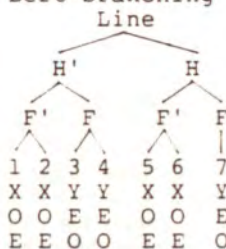
5. A UNIFIED ACCOUNT OF THE TONE STRUCTURE

Given half-lines as independent categories, the relationship between heptasyllabic and pentasyllabic lines is apparently that of branching vs nonbranching in terms of the first half-line. Then, a unified treatment naturally follows. Both heptasllabic and pentasyllabic lines are generated by the labeling rule in (12). [5]

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[5] This is along the same lines as James Huang's idea noted in Yip (1980). Note that this is not just a technical matter. In metrical phonology, the notion of sisterhood is usually defined with respect to a particular prosodic level. Thus, sisters nodes are those segments which are adjacent to each other at the same prosodic level. From this point of view, Kiparsky's suggestion of making distinctions between nonbranching, branching and 'super-branching' (also noted in Yip (1980)) doesn't seem attractive, because with respect to the half-line level and the foot level, the distinction between nodes is simply that of branching vs. nonbranching.
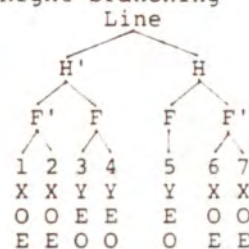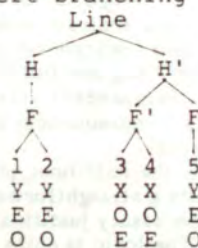
(12) Labeling Rule

In a pair of sister nodes $[N_1,N_2]$, N_1 is labeled N' iff it branches, otherwise, N_2 is labeled N'.

In the rule, N_1 and N_2 always have labels opposite to each other. This labeling rule, in effect, is exactly like Yip's Labeling Convention 1. The difference is that the analysis proposed here uses this single labeling rule to generate the correct tone patterns for both heptasyllabic and pentasyllabic verse lines. [6] Further, consistent with the general assumption of the metrical theory, the sister nodes N_1 and N_2 in (12) refer to two adjacent nodes at the same prosodic level, such as the foot level or half-line level. Now consider the derivations shown in (13).

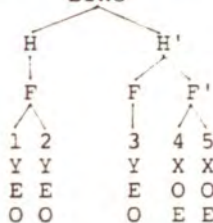(13) a. Heptasyllabic

```
        Left-branching                    Right-branching
              Line                              Line

         H'          H                     H'          H
        /\          /\  |                  /\          |   \
      F'   F      F'   F                 F'   F        F    F'
     /\   /\     /\    |                /\   /\        |   /\
     1 2  3 4    5 6   7                1 2  3 4       5   6 7
     X X  Y Y    X X   Y                X X  Y Y       Y   X X
     O O  E E    O O   E    (X = O)     O O  E E       E   O O
     E E  O O    E E   O    (X = E)     E E  O O       O   E E
```

b. Pentasyllabic

```
        Left-branching                    Right-branching
              Line                              Line

         H          H'                    H            H'
         |          /\                    |            /  \
         F        F'   F                  F           F    F'
        /\       /\    |                 /\           |   /\
        1 2      3 4   5                 1 2          3   4 5
        Y Y      X X   Y                 Y Y          Y   X X
        E E      O O   E    (X = O)      E E          E   O O
        O O      E E   O    (X = E)      O O          O   E E
```

---

[6] Yip (1980) points out that her treatment is of particular interest because it is consistant with the proposal (Halle and Vergnaud, 1978) that metrical trees in all languages are labelled by one of universal conventions, Labelling Convention 1, or its mirror image Labelling Convention 2. Notice that the present treatment is perfectly consistent with the proposal.

For pentasyllabic verse, the foot (being the only foot) in the first half-line is not labeled by the Labeling Rule and the foot simply inherits the label of its mother. The labeling rule is unaware that the foot is branching when it applies at the half-line level. We can see that as the varibles are specified, alternating between E and O, only four passible lines are generated for heptasyllabic verses and four for pentasyllabic verses The labeling rule correctly generates all and only the permitted lines.

The notions of prosodic level and prosodic categories are not new and have been widely accepted in the literature concerning various languages. Selkirk (1980) discusses the role of prosodic categories and indicates that English stress makes a special appeal to the syllable and foot and their internal structures. Kiparsky (1979) has a similar discussion, arguing that in English phonology the foot is independently motivated because phonological processes are actually bounded by it; therefore phonological rules make crucial use of the foot as relevant domain. Hayes (1981) presents examples from other languages, supporting the same argument.

6. CONCLUSION

The canonical tone patterns of Chinese regulated verse have a hierarchical structure. It is hierarchical because the syllables are grouped in terms of the feet which in turn are organized in terms of the half-lines, submitting to the relevant tone conditions as shown above. As a result, the relation between any two contiguous feet in a line as well as the relation between any two contiguous syllables is not simply a matter of linear adjacency. As we have seen, it is either the relation between two sister feet within a half- line or the relation between two non-sister feet across half-lines.

Thus, half-lines are essential prosodic categories in the tone structure of Chinese regulated verse. The traditional analysis Wang (1957) provides indepentent support for recognizing their existence. Previous metrical analyses neither capture the insight from Wang nor fully realize the essentiality of specifying the half-lines with independent status, although they virtually employ the notion half-line. As a consequence, they fail to represent the tone structure in a satisfactory way.

In the present analysis, by contrast, the half-lines play a crucial role. This is crucial because it not only permits a straightforward representation of the tone structure but also provides necessary justification for the claim that there is a phonological hierarchy. The logic is quite simple: the claim does not truelly stand until the independent status of the half-line as well as the foot is fully recognized.

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Relative Clause Acquisition in Second Language: The Effects of Reversed Branching Direction*

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University of California at Berkeley

A major problem in second language learning research is accounting for the influence of learners' first language (L1). However, it has been recognized that language transfer from first language is a complex phenomenon, which cannot be accounted for merely by contrastive analysis derived from specific facts about the target language and the learner's native language. Thus, in order to search for the mechanisms of language transfer, language universals and markedness theories have been incorporated into the cross-linguistic perspectives in second language learning (Eckman, Bell & Nelson 1984; Gass & Selinker 1983; Rutherford 1984).

To look at this fundamental issue, this study focuses on the acquisition of relative clause formation in a second language (L2). I will first review previous studies, and then present the design, method, and results of my study. The present study investigates the effects of reversed branching direction (L1 vs. L2), in light of language universals and transfer. At the end, I will point out three conclusions we can draw.

1. BACKGROUND
Previous studies have presented conflicting results on the significance of language transfer and of universal principles.

1.1. Language transfer and contrastive analysis
Schachter (1974) investigated the structure of English relative clauses (RCs) in free compositions of adult L2 learners. She found that the number of RCs used differed from speakers of one language group to speakers of another. She interpreted the results as an indication that one's native language plays an active role in the form of avoidance. She hypothesized that the Chinese and Japanese speakers found English RCs more difficult than did the Arabic and Persian speakers, and therefore avoided them. She attributed the difference between the two groups (Chinese and Japanese vs. Arabic and Persian) to the different positions of relative clauses with respect to the head noun. In Chinese and Japanese, relative clauses are prenominal (unlike in English), whereas in Persian and Arabic they are postnominal (as in English).

Hakuta (1974, 1976), in his case study of a Japanese child acquiring English as a second language, also found that the Japanese child produced RCs less frequently than the Spanish-speaking child, supporting Schachter's hypothesis of 'structural avoidance.'

1.2. Universal principles and language universals
There are also many cases of errors that cannot be attributed simply to a learner's native language. As an alternative, researchers have investigated intralingual complexities as a significant variable in L2 acquisition. In an attempt to define a potential natural sequence for the structural complexity of RCs, three important linguistic hypotheses have been proposed: the Center-Embeddedness Hypothesis, the Parallel Function Hypothesis, and the Accessibility Hierarchy Hypothesis. The first two were initially devised and tested in the context of L1

acquisition. The Accessibility Hierarchy Hypothesis was originally based on typological studies of many languages.

Kuno (1974) hypothesized that center-embedding is perceptually difficult. This is supported by Slobin's (1973) Operating Principle D4 ("Avoid interruptions of underlying linguistic units."). For example, OS and OO types (non-center-embedded) are easier than SS and SO types (center-embedded) in English:

OS: He likes almost all movies that have a happy ending.

OO: I usually like food that I can eat with my fingers.

SS: The boy who kissed Mary was one of the tennis players.

SO: The movie that we saw in New York was interesting.

Hakuta (1981) supported the basic idea of this hypothesis, showing the other two to be inadequate, by studying Japanese children's first language acquisition by means of imitation tasks.

Elsewhere, Sheldon (1974) proposed the Parallel Function Hypothesis, claiming that relative clauses that exhibit a parallel function with the head noun will be acquired more easily than those that do not. For example, SS and OO types (parallel function) would be easier than SO and OS types (non-parallel-function).

The Accessibility Hierarchy Hypothesis ("AHH") was proposed originally by Keenan and Comrie (1972, 1977, 1979), arguing that there exists a universal hierarchy of grammatical relations out of which relativization can take place, based on a survey of over 40 languages. The Accessibility Hierarchy ("AH") is (from highest to lowest): Subject (SU), Direct Object (DO), Indirect Object (IO), Object of Preposition (OPREP), Genitive (GEN), and Object of Comparative Particle (OCOMP). The first version of the AHH proposed that if some given type of RC exists in a language, then all RC types higher in the hierarchy will also exist in that language; and that frequency of use will be greater for RC types higher in the hierarchy. The AHH can be extended to include the proposition that higher RC types are easier to learn. Under this hypothesis, OS and SS types would be easier than OO and SO types.

1.3. Language universals and language transfer

The following studies have incorporated the above universal proposals into second language research.

Ioup and Kruse (1977) examined these three plausible hypotheses by eliciting grammaticality judgements on English RCs from adult L2 learners. Their results showed no significant differences among groups based on language backgrounds. They concluded that syntactic interference from the native language is not a significant learning variable in L2 acquisition, and that the Center-Embeddedness Hypothesis offers insights into the linguistic behavior of learners.

Gass (1979, 1980, 1982) examined the Accessibility Hierarchy Hypothesis in adult L2 learning, using grammaticality judgement tests and sentence combining tasks, and the results supported the AHH. With regard to the significance of language transfer in accounting for their errors, pronoun retention was the only variable for which transfer effects were evident. She also analyzed percentages of relative clauses in free written composition; the frequency distributions of RCs did conform to the AH with the exception of genitive RCs (Gass 1982). One of the most important findings was that in more marked relative clause constructions, learners tend to judge RCs with pronoun reflexes as grammatical,

regardless of whether their native RC has a resumptive pronoun in that position of the AH.

1.4. The effects of reversed branching direction in relation to language universals and transfer

Most of the studies mentioned above did not examine the effect of reversed branching direction (L1 vs. L2) in the acquisition of RC formation, in relation to language universals and transfer. It is difficult to examine this effect, since it may not be observed directly in the form of simple language transfer from the features of the native language. Ioup and Kruse (1977) and Gass (1979, 1980, 1982) found that grammaticality judgement errors resulting from opposite positions of RCs occurred infrequently, in their elicitation of grammaticality judgements given in a written form. The results indicate that even Japanese and Chinese native speakers 'know' a relative clause should come after the head noun. However, when processing sentences in real time, they may still have problems caused by the reversed positions.

The importance of Schachter's studies (1974, 1976) and Hakuta's study (1976) is that they suggested that Japanese and Chinese speakers might have difficulty because of the reversed branching direction. Under Schachter's hypothesis (1974), it would be reasonable to expect that, if forced to use RCs, Japanese and Chinese speakers would in fact make many errors. These, however, are open questions until they are tested by some means other than avoidance. We are compelled to study where the difficulties can occur and what kinds of errors are made.

2. RESEARCH DESIGN

The primary purpose of this study is to examine the effects of branching direction reversal (L1 vs. L2) in relative clause acquisition in adults' second language, here specifically for Japanese speakers learning English. In order to examine the complex nature of language transfer, the design also takes into account some universal principles and the markedness of RCs, such as the Accessibility Hierarchy Hypothesis, and the Center-Embeddedness Hypothesis. The effects were examined in terms of learners' strategies and difficulty in processing sentences in elicited imitation tasks. As a control, Spanish speakers learning English are compared. Japanese and Spanish speakers learning English were chosen because Japanese RCs precede the head noun (unlike English RCs) and Spanish RCs follow the head noun (like English RCs).

The specific questions asked are these: **1)** Do L2 learners whose NL has a left-branching direction, in which RCs come before the head noun, have more difficulty in acquiring or processing an English sentence with a right-branching RC than those whose NL has a right-branching direction, as in English? That is, do Japanese native speakers have more difficulty than Spanish speakers in processing English sentences with RCs? **2A)** If it is the case that Japanese speakers have more difficulty, where does the difficulty occur ? Can the effect of the reversal of PBD be found in all RCs, or is it found specifically in particular kinds of RCs ? **2B)** To what extent could universal principles, such as the Accessibility Hierarchy Hypothesis (Keenan and Comrie), the Embeddedness Hypothesis (Kuno), and the Parallel Function Hypothesis, predict learners' difficulties in processing sentences containing RCs (for both Japanese and Spanish speakers) ? **3)** When learners are forced to process and use RCs, what

strategies do they use to overcome their difficulties in dealing with such sentences? Are there patterns (or errors) unique to Japanese learners?

3. METHOD
3.1. Subjects
The subjects were 21 students in the English Language Institute of the University of Michigan: eleven Japanese speakers and, as a control, ten Spanish speakers, all of whom had the same range of scores in the listening section (range: 10-15, Spanish: $\overline{X}$=13.2, Sd=1.8, Japanese: $\overline{X}$=13.0, Sd=1.4) as well as in the other parts of their Michigan placement tests (range: 64-85, Spanish: $\overline{X}$=74.7, Sd=7.4, Japanese: $\overline{X}$=74.4, Sd=7.1) (see Note 1). Five native speakers were given the same tasks as a control; all the responses were word perfect repetition.

3.2. Test sentences
Table 1: Selected Test Sentences

#1. SU:	(OS)(N-CE)	He likes almost all movies that have a happy ending.
#2. SU:	(SS)(CE)	The boy who kissed Mary was one of the tennis players.
#3. DO:	(OO)(N-CE)	I usually like food that I can eat with my fingers.
#4. DO:	(SO)(CE)	The movie that we saw in New York was interesting.
#5. IO:	(N-CE)	I met the boy that I taught English to three years ago.
#6. IO:	(CE)	The boy that Mary sent a letter to was very short.
#7.OPREP:	(N-CE)	I want to go back to the store that we bought this dog at.
#8.OPREP:	(CE)	The lady that I talked with was very interesting.
#9. GEN:	(N-CE)	I was sorry for the children whose mother had died.
#10.GEN:	(CE)	Children whose fathers are doctors are not always healthy.
#11.OCOMP:	(N-CE)	She talked about the boy that Tom studies harder than.
#12.OCOMP:	(CE)	The girl that Mary is taller than runs very fast.

CE = center-embedded, N-CE = non-center-embedded

SU = subject, DO = direct object, IO = indirect object, OPREP = object of preposition, GEN = genitive, OCOMP = object of comparative particle

Twelve sentences of 13-14 syllables with relative clauses were selected, as shown in Table 1. The 12 sentences consisted of two sentences with RCs from each of the six positions in the Accessibility Hierarchy. One of the two for each position had center-embedded and the other non-center-embedded RCs. That is, there were six center-embedded RCs and non-center-embedded ones as a whole. In order to keep the relative markers neutral, the complementizer 'that' was used in all cases except the genitive where 'whose' was used. Before the test sentences, one example and two throw-away sentences, which did not include RCs, were given. The twelve test sentences were randomized. The test sentences were recorded by a male native speaker of English.

3.3. Procedure
Each subject was tested individually. Instructions were given in written form first and any of the questions they asked were answered in English. Ss were asked to repeat each sentence recorded by a native speaker. Each interview was recorded and later transcribed.

3.4. Analysis of the data
The transcribed data were analyzed as follows. Judgements of 'correct' (score = 1) and 'incorrect' (score = 0) responses were made for each sentence, as

well as for each clause (main and subordinate). A sentence was judged 'correct' if and only if both its clauses were 'correct' (i.e. full sentence = 1 iff subordinate clause = 1 and main clause = 1).

For a response (sentence or clause) to be judged 'correct', word-perfect repetition was not required. Also allowed were modified responses (paraphrases) that preserved the full meaning and were grammatically accurate. Minor grammatical errors and morphological errors, such as those involving subject-verb agreement, agreement in number (singular/plural), and change of tense and aspect, were ignored. Grammatical errors related to relative clause formation, such as resumptive pronouns and wrong choice of relative markers, were also disregarded. On the other hand, a response was scored as 0 ('incorrect') if the meaning differed substantially from the original, or if grammatical errors reflected learners' incomplete comprehension. The reason for this "generous scoring" is that this study is not primarily intended to measure grammatical accuracy. Rather, it examines the degree of difficulty learners have in processing complex sentences, and learners' strategies in dealing with them.

The ways the sentences were changed or misinterpreted by the subjects were, however, examined separately. Grammatical errors related to relative clause formation, such as resumptive pronouns were also analyzed separately.

4. RESULTS and DISCUSSION
4.1. Spanish speakers vs. Japanese speakers (Question 1 & Question 2A)

We begin by comparing the Spanish and Japanese group-average scores for each of the twelve test sentences.

Figures 1, 2, and 3 show the percentage of 'correct' responses to each sentence; Figure 1 for full sentences, Figure 2 for subordinate clauses, and Figure 3 for main clauses. The most general result was that Spanish speakers performed much better than Japanese speakers. Other important results were that both Spanish and Japanese speakers repeated main clauses better than subordinate clauses, and that a greater performance gap between Spanish and Japanese speakers was observed in the repetition of subordinate clauses rather than in main clauses.

Group differences were tested on each sentence by means of two-tailed binomial tests. The results are summarized in Table 2.

The analysis of full sentence responses showed that there were statistically significant differences ($p < 0.05$) between the Spanish group's and the Japanese group's scores on sentences #1 (SU), #3 & #4 (DO), #5 & #6 (IO), and #9 (GEN). With regard to subordinate clauses, there also appeared significant differences between the two groups' scores for sentences #1 (SU), #3 (DO), #5 & #6 (IO) and #9 & #10 (GEN).

Thus, in both full sentence scores and subordinate clause scores, differences between Spanish speakers and Japanese speakers were generally significant in the responses to the RCs in the higher portion of the accessibility hierarchy (SU, DO, and IO) as well as to Genitive RCs. In other words, it was in the sentences with highly accessible RCs that Spanish speakers tended to outperform Japanese speakers significantly. The sentences with less accessible RCs, on the other hand, were so difficult for both groups that the difference between the groups was not significant. These findings conform to our prediction that RCs of the lower positions in the accessibility hierarchy would be more difficult for both Spanish and Japanese speakers, and that the group differences would be more pronounced in the higher positions of the hierarchy. The results for sentences
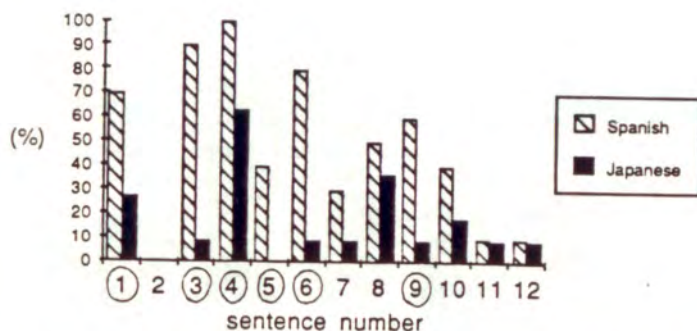
323

Figure 1. Full Sentence Scores: Spanish vs. Japanese (Individual Sentences)

Figure 2. Subordinate Clause Scores: Spanish vs. Japanese (Individual Sentences)
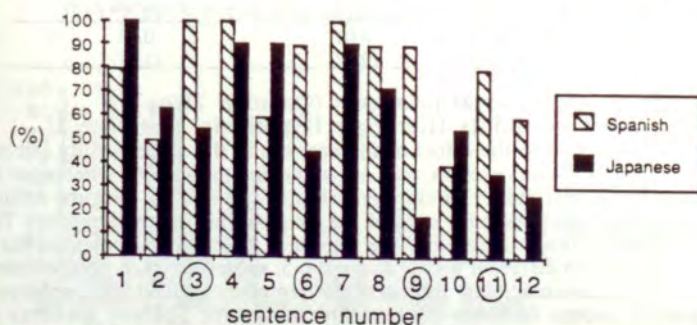

Figure 3. Main Clause Scores: Spanish vs. Japanese (Individual Sentences)

A circled number means that the difference between Japanese group average and Spanish group average is significant at the 5% level (two-tailed binomial test).

with genitive RCs would not be surprising if we can assume that genitive RCs are more accessible for learners than the accessibility hierarchy would predict. This was actually supported in this study, as was the case in Gass's study.

The results for main clauses, however, were not consistent with the tendencies discussed above. Although significantly higher scores for Spanish speakers were found in four sentences (#3, #6, #9 and #11) (p < 0.05), Japanese speakers scored better than Spanish speakers on main clauses in four sentences (#1, #2, #5, and #10), but not significantly.

Table 2: Results of Binomial Tests.
Spanish Group Average minus Japanese Group Average.
Z-statistics in parentheses. *Significant at the 5% level (two-tailed test)

sentence number	sentence type	Full Sentence	Subordinate Clause	Main Clause
#1	SU / N-CE	0.43 (1.96*)	0.53 (2.42*)	- 0.20 (- 1.56)
#2	SU / CE	0.00 (0.00)	0.10 (1.07)	- 0.14 (- 0.63)
#3	DO / N-CE	0.81 (3.71*)	0.72 (3.29*)	0.45 (2.44*)
#4	DO / CE	0.36 (2.12*)	0.27 (1.78)	0.09 (0.98)
#5	IO / N-CE	0.40 (2.33*)	0.40 (2.33*)	- 0.31 (- 1.66)
#6	IO / CE	0.71 (3.28*)	0.71 (3.28*)	0.45 (2.16*)
#7	OPREP / N-CE	0.21 (1.22)	0.21 (1.22)	0.09 (0.98)
#8	OPREP / CE	0.14 (0.63)	0.15 (0.67)	0.17 (1.01)
#9	GEN / N-CE	0.51 (2.47*)	0.51 (2.47*)	0.72 (3.29*)
#10	GEN / CE	0.22 (1.11)	0.52 (2.40*)	- 0.15 (- 0.67)
#11	OCOMP / N-CE	0.01 (0.07)	0.02 (0.11)	0.44 (2.02*)
#12	OCOMP / CE	0.01 (0.07)	0.01 (0.07)	0.33 (1.51)

4.2. Effect of universal principles (Question 2B):
The Accessibility Hierarchy Hypothesis (see Note 2)

We now turn to the effect of markedness in the Accessibility Hierarchy of relativization. In this section, data are organized to examine whether or not they reflect the Accessibility Hierarchy (Figures 4,5,and 6). Figure 4 shows the average response scores for each of the six positions in the hierarchy. To give a more detailed understanding of the effects of grammatical position, the sample was split in two different ways. In Figure 5, scores for each position are shown for non-center-embedded RCs and for center-embedded RCs separately. In Figure 6, scores for each position are shown for Spanish speakers and for Japanese speakers separately.

Figure 4 lends qualified support to the Accessibility Hierarchy Hypothesis. Out of the fifteen pairwise comparisons that can be made between positions, 9.5
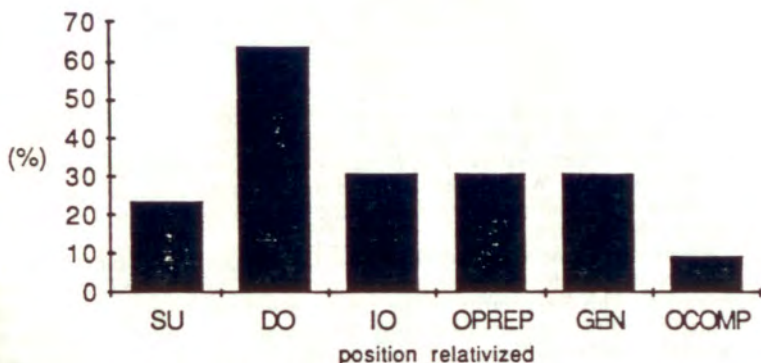
Figure 4. Grouped by Position
(Full Sentence Scores; Spanish and Japanese Combined)
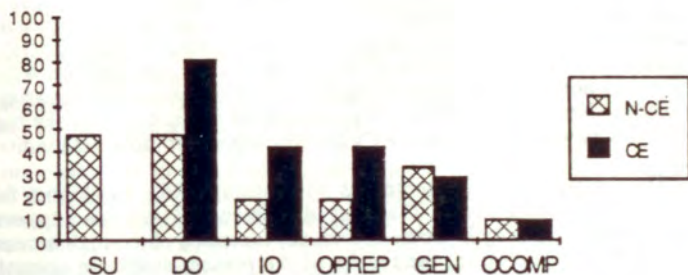

Figure 5. Grouped by Position:
Non-center-embedded (N-CE) vs. Center-embedded (CE)
(Full Sentence Scores; Spanish and Japanese Combined)

Figure 6. Grouped by Position: Spanish vs. Japanese (Full Sentence Scores)

fit the hypothesis and **5.5** do not. The violations are: SU < DO, SU <IO, SU <OPREP, SU <GEN, IO = OPREP, IO = GEN, and OPREP = GEN. (I.e. SU < DO means that the average score for sentences with subject RCs is lower than that for sentences with direct-object RCs, which is contrary to AHH predictions. Equality was counted as 0.5 of a violation.)

However, the sources of these violations can be seen much more clearly in the split-sample charts, Figures 5 and 6. It becomes apparent in Figure 5 that the relatively low score on subject RCs is mainly due to the low score for sentence #2 (center-embedded). We also see in Figure 6 that it is the Japanese speakers who scored so low on indirect-object RCs, while Spanish speakers' performance was closer to AHH predictions.

Relatively low accessibility of a subject RC, especially in sentence #2, and indirect object RCs for Japanese speakers is contradictory to prediction and even perplexing. This irregularity in the results may have been caused by varied familiarity and perceptual accessibility of individual lexical items, and sentence structures of the main clauses. These factors could not be homogenized across subjects and sentences, since the task included only twelve sentences and the number of the subjects was limited due to vicissitudes of field research. Thus, individual lexical items may have facilitated or impeded sentence processing. The comparatively low score on sentence #2 was actually related to frequent comprehension errors of 'Mary' as 'marry'. Other irregularities may have been caused by lexical semantics, another factor involved in the learners' sentence processing strategies, which will be discussed later (see Section 4.3.1). This factor was not designed to be a variable, nor controlled in preparing the test sentences. Yet, it will give us one possible *post hoc* account for the high scores for sentences with direct-object RCs and low scores for those with indirect-object RCs.

The average score for sentences with genitive RCs was higher than AHH predictions. Recall that Gass' study presented results supporting the Accessibility Hierarchy Hypothesis with the exception of too high accessibility of genitive RCs. Therefore, the results of the present study are consistent with Gass' findings.

4.3. Sentence processing strategies (Question 3)
4.3.1. Types of misinterpretation and paraphrasing

In this section, we will examine the ways in which relative clauses were misinterpreted or paraphrased by the learners. In a typical case, learners converted non-subject RCs into subject RCs. They do it in one of two ways: Either they drop the subject in the subordinate clause, or they convert it into another argument, so that either way the head noun ends up being the subject of the predicate in the relative clause.

For example, in the repetition of sentence #5, seven subjects took the relativized indirect object as the relativized *subject* of the subordinate clause, as shown in responses 5a) through 5g) below.

I MET THE BOY THAT I TAUGHT ENGLISH TO THREE YEARS AGO. (#5)
5a) I am the boy that taught English three years ago.   (Spanish-Sp)
5b) I am a boy that taught English for three years ago.   (Sp)
5c) I am the boy who taught you English at three years ago.(Sp)
5d) I met a boy who learned English three years ago.   (Japanese-Jp)
5e) I met a boy that taught me three years ago.   (Jp)

5f) I met the boy who spoke English about three years ago. (Jp)

5g) I met a boy who talks English three years ago.   (Jp)

5h) I met a boy he /to:/ told me English /ko:/. (Jp)

5i) I met a boy he taught me English three years ago. (Jp) .

As is shown in responses 5h) and 5i), two Japanese speakers used the pronoun 'he' instead of 'who' or 'that' to anaphorically bind the two nouns referring to 'a boy'. Regardless of whether we interpret these responses as evidence of avoiding the RC use, or simply as the wrong use of 'relative markers,' the point to be made here is that the first noun 'boy' is being interpreted as the subject of the second predicate, 'told' and 'taught', and that the original subject of the second predicate (in the subordinate clause) is interpreted as the Dative (Object) argument of the predicate.

The same phenomenon can be observed in the repetition of sentence #6 by six Japanese speakers. Two of them used subject RCs in their responses (see responses 6a and 6b). Responses from four more Japanese speakers exhibit similar misinterpretations, although they did not construct proper English relative clause using a subject relative marker (see 6c,6d,6e,and 6f):

THE BOY THAT MARY SENT A LETTER TO WAS VERY SHORT. (#6).

6a) The boy who sent the letter is very short.   (Jp)

6b) The boy who sent a letter to us is very short. (Jp)

6c) The boy sent a letter to Mary is too short.   (Jp)

6d) The boy sent a letter to Mary is a short.   (Jp)

6e) The boy and Mary sent the letter very short.   (Jp)

6f) The boy sent a letter is very short.   (Jp)

We notice that, in all responses 6a) through 6f), the head noun, 'the boy', which filled the gap in the Dative position of the predicate 'sent' in the subordinate clause of the original sentence, became the subject of the predicate. In other words, the boy became the agent instead of the recipient. The original subject/agent of the subordinate clause (Mary) was either ignored (6a,6b,6f), or interpreted as the recipient (6c,6d). Actually, only one Japanese speaker succeeded in interpreting 'Mary' as the agent and 'the boy' as the recipient of the verb 'sent'. This tendency exhibited by Japanese speakers contrasts sharply with the fact that all of the Spanish speakers succeeded in identifying the correct agent and recipient. The Japanese speakers' relatively low score on Indirect Object RCs was due to the kind of error being discussed here.

The same kind of changes were observed in the responses to test sentences #8, #11, and #12.

As we have seen, the misinterpretation as well as the paraphrases of RCs in learners' responses reflected an inclination toward subject RCs. We can interpret this inclination toward subject RCs as an indication of high accessibility of the syntactic subject for relativization.

However, it seems more plausible to attribute this to a sentence processing strategy based on canonical word order. This strategy, proposed by Bever (1970), interprets a <u>Noun-Verb-Noun sequence</u> as <u>Agent-Action-Patient</u>. This is the correct interpretation for many simple active sentences, and for English subject RCs, but not for other RCs. That is, English subject RCs tend to preserve this canonical word order while other RCs do not. This strategy is evidenced in the observation of first language development of English-speaking

children. For example, overgeneralizing this strategy, English-speaking children of around age **four** systematically misinterpret **reversible passive** sentences, choosing the first noun of the sentence as the agent. Second language learners also seem to use this positional strategy, taking the first noun as agent, when complex sentences are too difficult to process.

Furthermore, among the non-subject RCs, the head noun and the subject in the subordinate clause are semantically **irreversible** in test sentences #3, #4, and #7. (Test sentences are shown in Table 1 in Section 3.2.) That is, if you switch the head noun with the subject in the RC, the sentence doesn't make sense. For example, in #4 ("The movie that we saw in New York was interesting."), "we saw the movie." would become "the movie saw us", which does not make sense. On the other hand, in test sentences #5,#6,#8,#11,and #12, the two nouns are reversible. For example, in #5 ("I met the boy that I taught English to three years ago."), "I taught the boy" would become "the boy taught me", which still makes sense. It was in these **reversible** sentences that the change into subject RCs occurred, rather than in the irreversible sentences. This suggests that learners may be using lexical semantic strategies when processing sentences with RCs. That would enable them to accurately interpret RCs in which lexical items are **irreversible.** On the other hand, with RCs in which lexical items are reversible, they rely on the canonical word order, taking the first noun as agent. This generally results in the kind of misinterpretations I have been discussing here.

4.3.2. Resumptive pronouns

Finally, let us look briefly at resumptive pronouns. Responses 8a), 11a), 11b), and 11c) below show some examples in which learners inserted resumptive pronouns. Notice that these resumptive pronouns were added in cases where both the original RCs and the RCs created were low in the accessibility hierarchy.

THE LADY THAT I TALKED WITH WAS VERY INTERESTING. (#8)
8a) The lady that I talked with <u>her</u> is very interesting.(Sp)
SHE TALKED ABOUT THE BOY THAT TOM STUDIES HARDER THAN. (#11)
11a) She talked about the boy that Tom taught <u>him</u>.(Jp)
11b) She talked about the boy with whom she studies hard with <u>them</u>.(Sp)
11c) She talked about the boy that Tommy studied harder than <u>them</u>.(Sp)

5. CONCLUSIONS

From this study, we can draw three main conclusions, which answer the three questions posed in Section 2 (Research Design) of the paper.

Pertaining to Question 1, this study showed that native speakers of Japanese have more difficulty with English RCs than do Spanish speakers. Since it was a controlled study, it is plausible to attribute this difference mainly to the effect of the reversed branching direction (L1 vs. L2). In other words, this study suggested that branching direction reversal is a significant factor which causes difficulty in L2 sentence processing.

Principal branching direction is one of the proposed parameters in Universal Grammar, which is claimed to be effective in first language acquisition. Flynn (1981, 1984) studied second language acquisition of temporal subordinate clauses, and showed that the principal branching direction parameter was an

important factor in second language acquisition, proposing a parameter-setting model of L2 acquisition based on the Government and Binding Theory.

The present study provided additional evidence supporting the significance of the L1 branching direction in L2 acquisition. However, we cannot interpret this as evidence supporting the parameter-setting model of L2 acquisition proposed by Flynn. We need to recall that, in Gass's study and Ioup and Kruse's study using grammaticality judgement elicitation, the effects of reversed branching direction were found to be insignificant, while they were found to be significant in the current study. This suggests that the effect is not a monolithic phenomenon, and that learners do not overcome the mismatch of branching direction instantaneously by having knowledge about it. Thus, the issue is not just whether the learner has set a value for the branching direction parameter in her knowledge of the target language. It seems that a richer model is needed to account for the complex nature of the effects and to investigate how the mismatch is overcome.

Pertaining to Question 2 (from the Research Design section), the response scores provided qualified evidence in favor of the Accessibility Hierarchy Hypothesis regarding predictions of learners' difficulty. Moreover, frequent occurrence of resumptive pronouns in RCs in the lower portion of the hierarchy supports the claim that RCs in the lower portion of the accessibility hierarchy are more marked and thus more difficult for learners to process. The hierarchy also provides an important framework for analyzing the effects of different native languages. It was in the sentences with highly accessible RCs that Spanish speakers tended to outperform Japanese speakers significantly

Pertaining to Question 3, the observation of changes made in learners' responses leads us to believe that a first attempt at comprehension involves using lexical information from words in the sentences they hear. They process a difficult sentence, using pragmatic/semantic strategies based on the lexical semantics of the words they have comprehended . When they are unable to use the lexical semantics in reversible sentences, they then depend on the positional sentence processing strategy, taking the first noun as agent. This tendency is even more pronounced in Japanese speakers, possibly because they are less able to rely on proper syntactic information than Spanish speakers. This may result from either the Japanese speakers' difficulties in processing complex sentences or directly from characteristics of sentence processing strategies used in the Japanese language.

The fact that this semantic/pragmatic factor was neither designed to be a variable nor controlled in preparing the test sentences, may have impaired observation of the other universal principles which were indeed intended as variables. Yet comparison of the two native language groups, which was the primary purpose of this research, remains valid. Furthermore, the examination of changes made by learners based on semantic/pragmatic factors permitted comparisons of the two native language groups in another light. It revealed lexical semantics as one of the strategies for processing complex sentences and raised an important issue for further research.

NOTES

1. The listening section of their Michigan placement test included twelve target sentences containing no relative clause formation although six of them were complex sentences containing other types of subordinate clauses.

2. Space does not allow presentation of results regarding the Center-embeddedness Hypothesis and the Parallel Function Hypothesis. But, essentially the results of this study did not support these hypotheses.

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To compare the non-imperatives and imperatives given so far requires one make the following generalization: the appearence of subject NP is contingent on the feature [+ or - Tense] in INFL, which assigns the abstract nominative Case. The imperatives in (7) are properly derived since an INFL with [-Tense] cannot assign Case.

Notice that problem arises when one considers the question of how to der: imperatives with subjects in languages, since [-Tense] does not license a NP with a Case.

> (8) You eat the cake!
>   You be quiet!
>   Someboby open the door!

To accommodate the imperatives with subjects, one has to make the opposite argument for a proper derivation of an NP subject. That is, one has to assume that imperatives with subjects are just like normal indicatives which have subjects. The NP subjects in imperatives are licensed by the Case assigner--INFL with [+Tense]. To do so, one runs into the difficulty in maintaining the distinction between imperatives and non-imperatives that has been drawn earlier, ie. imperatives are tenseless non-finite clauses just like infinitives which require no subject NP, whereas indicative sentences are tensed finite clauses and must have a subject NP.

1.3 Some Alternatives

There appear to be several possible approaches to this problem, each of which has its drawbacks.

1.3.1

The first approach simply asserts that imperatives must be viewed as containing a "stronger" INFL than infinitival clause. The imperative INFL (Imp-Infl) will govern the subject and allow imperative subjects to appear. Since imperative subjects are optional, they have to be taken as a variation of the empty category pro --nonanaphoric pronominal elements whose range is limited to you, everybody/somebody and etc. As it is known that English prohibits the occurence of pro due to the assumption that INFL cannot be a proper governor to license argument drop (as opposed to Italian or Spanish, where INFL properly governs the subject position and permits pro), one must postulate that pro is only allowed in imperatives but not in indicatives. In other words, in English Imp-Infl properly governs the subject position and normal INFL does not.

This idea, however, will not explain when and why you may occur or cannot occur in the following data unless one evokes some lexical explanations which are not likely to fall under any principles we know in GB.

> (9) Do eat the cake!
>   *Do you eat the cake!
>   Don't you eat the cake!
>   *Do not you eat the cake!
>   Do not eat the cake!

1.3.2

The second approach is to assume that an imperative subject does not land in the real subject position (NP of S) but rather in Topic position that is adjoined to IP. In order to obey the binding theory, Top must be adjoined to IP instead of being located within CP (10).

Case assigner -- a tensed VP ie. INFL[+Tense], because the infinitival clause is characterized as being non-tensed ie. INFL [-Tense].

> (2) a. John wanted [[___to buy a book about linguistics]]
>   b.*John wanted [[John to buy a book about linguistics]]

1.2 Imperative as a Problem

Imperatives have been characterized as being tenseless and without AUX elements (Steele et al 1981). They are more or less similar to infinitives in that both are tenseless clauses. On these grounds, one may account for the fact that imperatives are usually without subjects. By the basic Phrase Structure Rule: S --> NP INFL VP, where INFL is [+Tense] in finite clause and INFL is [-Tense] in non-finite clause like infinitives and imperatives,[3] we will have the D-Structure representation in (3):

> (3)   NP INFL VP
>   / \
>   AGR Tense

The category INFL contains elements AGR and Tense. For indicative sentences, we will have the structure:

> (4) NP [$_{INFL}$ AGR [+Tense]] VP

An INFL with [+Tense] obligatorily assigns Case to the nominative subject NP since [$_{INFL}$] is a governor governing the NP. Therefore one can have the grammatical sentences in (5a,b) but not (5c,d):

> (5) a. John likes Chinese food.
>   b. Mary ate an apple last night.
>   c.* ___ likes Chinese food.
>   d.* ___ ate an apple last night.

The starred sentences are ruled out for lack of subjects by the Case Filter of Chomsky & Lasnik (1977) or by Case Theory, which requires a nominative Case be assigned to the subject position and Case has to be associated with being phonetically realized. Ruling out the starred sentences with such an analysis gives us the possibility of deriving subjectless imperatives with the following structure:

> (6) NP [$_{INFL}$ AGR [-Tense]] VP

Structure (6), being [-Tense], requires no Case be assigned at S-Structure to the NP and therefore no subject NP occurs. Structure (6) represents imperatives such as:

> (7) Eat an apple everyday!
>   Go to the Chinese restaurant!
>   Be quiet!

---

[3]. One may raise many questions regarding the category INFL as to whether it is equal to the earlier category Aux and what are the exact derivations of Aux elements and affix-hopping rules. I omit such issues since they are not crucial to the present discussion. But the issues remain.

To compare the non-imperatives and imperatives given so far requires one to make the following generalization: the appearance of subject NP is contingent on the feature [+ or - Tense] in INFL, which assigns the abstract nominative Case. The imperatives in (7) are properly derived since an INFL with [-Tense] cannot assign Case.

Notice that problem arises when one considers the question of how to derive imperatives with subjects in languages, since [-Tense] does not license a NP with a Case.

(8)   You eat the cake!
      You be quiet!
      Someboby open the door!

To accommodate the imperatives with subjects, one has to make the opposite argument for a proper derivation of an NP subject. That is, one has to assume that imperatives with subjects are just like normal indicatives which have subjects. The NP subjects in imperatives are licensed by the Case assigner--INFL with [+Tense]. To do so, one runs into the difficulty in maintaining the distinction between imperatives and non-imperatives that has been drawn earlier, ie. imperatives are tenseless non-finite clauses just like infinitives which require no subject NP, whereas indicative sentences are tensed finite clauses and must have a subject NP.

1.3 Some Alternatives

There appear to be several possible approaches to this problem, each of which has its drawbacks.

1.3.1

The first approach simply asserts that imperatives must be viewed as containing a "stronger" INFL than infinitival clause. The imperative INFL (Imp-Infl) will govern the subject and allow imperative subjects to appear. Since imperative subjects are optional, they have to be taken as a variation of the empty category pro --nonanaphoric pronominal elements whose range is limited to you, everybody/somebody and etc. As it is known that English prohibits the occurence of pro due to the assumption that INFL cannot be a proper governor to license argument drop (as opposed to Italian or Spanish, where INFL properly governs the subject position and permits pro), one must postulate that pro is only allowed in imperatives but not in indicatives. In other words, in English Imp-Infl properly governs the subject position and normal INFL does not.

This idea, however, will not explain when and why you may occur or cannot occur in the following data unless one evokes some lexical explanations which are not likely to fall under any principles we know in GB.

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      *Do you eat the cake!
      Don't you eat the cake!
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      Do not eat the cake!

1.3.2

The second approach is to assume that an imperative subject does not land in the real subject position (NP of S) but rather in Topic position that is adjoined to IP. In order to obey the binding theory, Top must be adjoined to IP instead of being located within CP (10).

(10)
```
        CP
       /  \
    Spec   C'
          /  \
         C    IP
             /  \
           Top   IP
                /  \
              NP    I'
                   /  \
                Infl   VP
```

As a result, imperative subjects do not depend on INFL to receive Case hence subjects will occur in imperatives despite the fact that INFL is [-Tense]. But where does an imperative subject receive Case if the Case assigner is not INFL? I assume, following Lebeaux (1986), that there are phrasal structural case assignment operations in addition to structural case assignment in terms of government and lexical case assignment in terms of case marking properties on lexical items. It is assumed that Case can be assigned to an element in terms of its position in a phrase structure. A Topic position could optionally receive a Case, and hence allow an overt NP.

(11)
```
        IP
       /  \
    Top    IP
   +Case
```
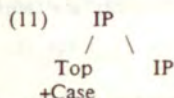
This idea is inspired by Gruber (1967)'s view on early speech. Gruber observes that children speak a different grammar than adults. He suggests that the language children speak is topic/comment oriented and the language adults speak is subject/predicate oriented. It is often possible to hear children saying:

(12)   Me eat an apple.
        Me did it.

The reason for the word "me", an accusative pronoun, to appear before the predicate is not because "me" occupies the subject NP position, but because "me" is in the Topic position. Suppose that "Me" were in the NP position, one would expect the correct form   "I" --the correct nominative form in adult grammar. I "me" is assumed to be in the Topic position in (13), one explains why "me" does not change into the nominative form "I" in early speech.

(13)
```
          S'
         / \
       Top   S
            / \
          NP   VP
              / \
             V   NP
```
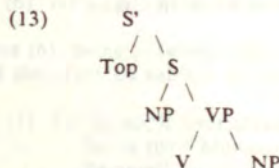
To extend this view to abstract Cases, one may think of the possibility of an imperative subject occupying the Topic position but not the NP position (14):

(14)
```
              S"
             / \
          Top   S'
         /     / \
        /    Comp  S
   Imp Subj      /|\
                NP    \
                 INFL  VP
```

One must assume that Topic is adjoined to IP as in (10) to satisfy the binding
theory and allow (15):

(15) Wash yourself!
You wash yourself!

As one can see the drawback of this proposal is still the unexplained
interaction between you, do, don't and do not in (9).

1.3.3
The third possible approach is given by Pollock (1987). Pollock gives an
analysis of English auxiliary element do interacting with the main verb do. He
assumes that in negative imperatives do is not an auxiliary but a causative verb
and not is dominated by Negative Phrase (NegP) and counts as a head for verb
movement in (17):

(16) Don't you have finished your homework when I come back.
Don't you be singing when I come back.

(17)
```
              IP
               \
                ..
                VP
               / \
             Do   CP
                    \
                     IP
                    / \
                  NP   I'
                  you / \
                     I    NegP
                   -finit / \
                        Neg   AgrP
                        not   / \
                            Agr  VP
                                 /
                                 V
                             be singing..
                             have finished..
```
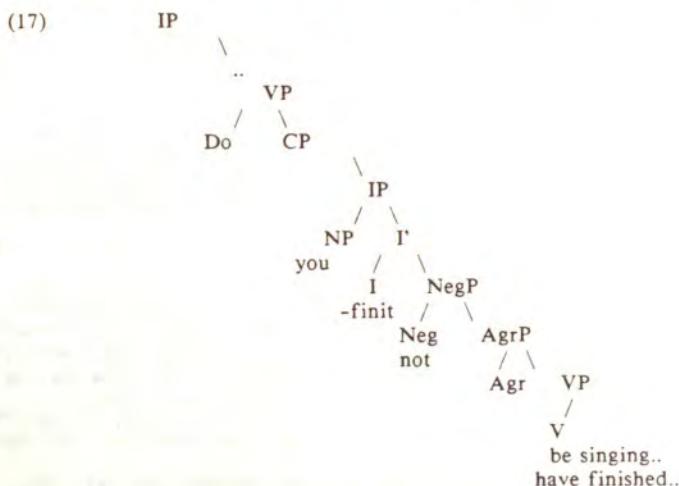
Since imperative IP is [-finit], subject NP can only receive Case from the
causative verb don't (after Neg moves to join it) which is assumed to properly
govern NP of the subject of the non-finite clause. Regarding sentences in (18),
(18) Do be a good sport.
*Do you be a good sport.

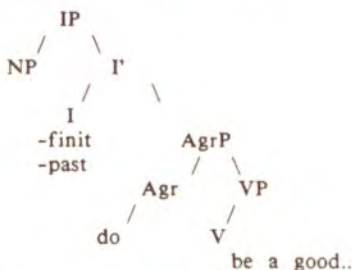Pollock argues that do is an auxiliary dominated by Agr. By head-to-head movement, do joins I and appears under I as do+I. Consequently, we have <u>Do be good sport</u> but not <u>Do you be a good sport</u>. This is because you does not have a governor, hence resulting in no Case and no presence.

(19)

```
                              IP
                           /     \
                        NP         I'
                                 /    \
                                I
                              -finit    AgrP
                              -past    /    \
                                     Agr     VP
                                    /        /
                                  do        V
                                          be a good..
```

Notice that imperatives without do or don't but with only the subject You presents a problem to the above analysis. By assumption, Pollock has to take sentences in (20) as [-finite].

(20) You eat the cake!
     You be quiet!

But [-finite] cannot assign Case to the subject of the non-finite clause as he just analyzes, how could one assure that you is legitimate in the sentences in (20)?

2. The Underlying Factor and the Independence of Imperatives

The above assumptions and possible analyses given so far have an obvious common characteristic: Imperative constructions are treated as derivative of indicative constructions. The skeletal structure NP INFL VP superimposed with sub-modules such as Case Theory and Theta Theory is intended to a large extent to account for indicative sentences. As a result, to represent and derive an imperative construction actually casts an imperative into a mold that is for indicatives. The generation of imperatives in an unsuitable mold is the source of the difficulties.

2.1 Prominent Characteristics

As a matter of fact, the imperative construction in general exhibits characteristic properties which are unique, as in French. In French, direct-object pronouns are usually proclitized to the verb, both in main clauses like (21) and subordinate clauses like (22). Sentences (23) show that the clitic and the verb behave as a unit in inversion (Schmerling 1975):

(21) a. Il le fait.
         he it does
         'He does it'
      b.* Il fait le.
(22) a. Je lui ai dit de le faire.
        I him told to it do
        'I told him to do it.'
      b.*Je lui ai de faire le.

(23) a.Le fait-il ?
it does he
'Does he do it ?'
b.*Fait-il le ?

But in the imperative, and only in imperatives, the direct-object clitic follows the verb:

(24) a. Faites-le!
do   it
'Do   it'
b.*Le faites!

Not only do French imperatives exhibit idiosyncratic formal properties, but also English imperatives show propertis distinct from indicatives. The verbs are bare stems and characterized as tenseless.

(25) Be quiet
*Are quiet
Somebody answer the phone
*Somebody answers the phone

Imperatives cannot have modals or auxiliary elments (Culicover 1971, Steele et al 1981, cf. Katz and Postal 1964, Schmerling 1977 for different views on auxiliary).

(26) *Must answer the phone
*Will eat the cake

Imperatives need have no syntactically expressed subjects and the range of occuring subjects is limited (Thorn 1966, Schmerling 1975).

(27)   Somebody/nobody/everybody stand up
*He/*she/*they open the door

Imperatives are the only non-finite clauses where do can appear. Not only is it optional but it is also distinct from the function of the "supportive" do in an indicative sentence

(28) *John wants Bill to do eat Chinese food
Do eat Chinese food
Eat Chinese food
The students do eat Chinese food.

Neither do nor do not can cooccur with expressed subjects in imperatives, although the contracted form don't is compatible with stressed, overt subjects.

(29) *Do you/somebody eat the cake
*Do not you/anybody eat the cake
Don't you/anybody eat the cake
Cross-linguistically, the majority of languages have special imperative forms or necessary markers, positive or negative. Imperative constructions are not equal to indicatives on many syntactic properties (Zhang 1986).
In Schmerling (1982), it is suggested that the most primitive kind of clause

that actually contains both a subject and a predicate would be one with an unmarked noun phrase as subject and an uninflected predicate is show as underlined:

(30)   I saw <u>John angry</u>.
I saw <u>John walk</u>.
I saw <u>John arrested</u>.

In contrast to these underlined clauses, indicative clauses exhibit considerable formal elaboration. Schmerling suggests that imperatives are the simplest clause type since they are the least elaborated: an imperative derived by identity from an intransitive-verb expression (ie. IV expressions in Montague's terminology) is " Go home!", "Be quiet!" etc. Although languages differ in formal elaboration in their imperatives (such as elaboration of verbal inflections for number, person and gender, for instance in Hebrew, Lithuanian, Persian; and such as expression of subjects and imperative particles, for instance, in Chinese, Japanese, Thai, Korean (Zhang 1986)), neither type of elaboration constitutes the kind of richly developed system found in indicative clauses. All this indicates that imperatives should not be derived from the indicatives in a simple manner but should be appropriately treated in their own right.

2.2 A Proposed Treatment of Imperatives in English

If we take imperatives as an independent sentence type, then it is natural for them to have their own system of derivations, i.e their own lexical idiosyncracies and categorial combinations. Here I assume the basic construct of "extended categorial grammar" (Bach 1983a, 1983b, Steedman 1985, Oehrle, Bach and Wheeler 1988) developed from ideas of traditional categorial analyses[4], making use of the algebric notion of a function and of features assoicated with lexical categories. A categorial grammar consists of two components (Steedman 1985). The first is a categorial lexicon, which associates each word of the language with at least one syntactic category, and distinguishes between functors and arguments. The second is a set of rules for combining functors and arguments. Below is a fragment of a grammar of English

A. Lexicon
    a. a primitive set of types S, N, NP, VP ...;
    b. a derived types NP/N, NP\S, NP/VP...;

eg. a sentence = S (Bill ate the cake, Bill will eat the cake..)
    a simple noun = N (cake, door...)
    a noun phrase = NP (the cake, the door, Bill...)
    a determiner = NP/N (the, this...)
    a tenseless verb = (NP\VP)/NP (eat, close...)
    a tensed verb = (NP\S)/NP (eats, closes, ate...)
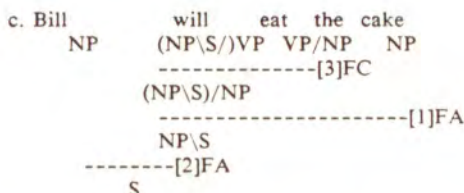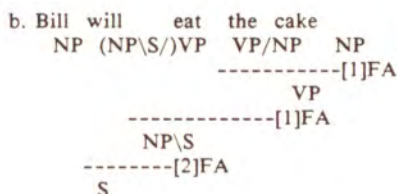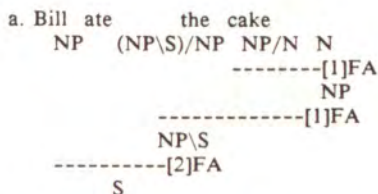
B. Combinatory Rules
    a. a set of operations such as{x/y, x\y, x\z/y...}
    b. for any expressions (functor expressions and argument expressions) a, b, c associated with types A, B, and C, respectively, the following hold:
[1] (a/b). b is associated with A

---

[4] Ajdukiewicz (1935), Bar-Hillel (1953), Lambek (1961) and Montague (1974), among others.

[2] b. (b\a) is associated with A
[3] (a/b) . (b/c) is associated with A/C[5]

eg.

```
a. Bill  ate      the  cake
   NP   (NP\S)/NP NP/N  N
                  -------[1]FA
                     NP
              ------------[1]FA
            NP\S
   ----------[2]FA
        S
```

```
b. Bill  will     eat  the cake
   NP  (NP\S/)VP  VP/NP  NP
                  -----------[1]FA
                     VP
              -------------[1]FA
            NP\S
     --------[2]FA
        S
```

```
c. Bill        will    eat  the cake
   NP       (NP\S/)VP VP/NP   NP
            --------------[3]FC
            (NP\S)/NP
            ----------------------[1]FA
            NP\S
     --------[2]FA
        S
```

Regarding the observed particular properties associated with imperatives, first we conclude that a plain predicate imperative is a tenseless VP with an understood subject whose range is limited.

```
(31) Eat    the  cake
     VP/NP      NP
     ------------[1]FA
          VP =IMP
```
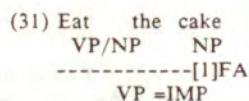
Second, there are five single or complex elements which may act on the plain predicate imperative eat the cake and produce another imperative. They are the expressed subjects you/somebody.., the emphatic negative complex don't you, the normal negative don't, the formal and forceful negative do not, and last the odd rarely-used do. Additionally if we think of a null element (unexpressed subject) acts on tenseless VP and yields a plain predicate imperative, we will have a set of six imperatives.

(32) Eat the cake

---
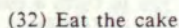
[5] Rules such as Division, Lifting, Slash-Dot-Convention (Lambek 1958), Lifting-Permutation (Steedman 1985) etc are not crucial here, hence are not included. FA stands for functional application.

You/somebody eat the cake
Do eat the cake
Don't eat the cake
Do not eat the cake
Don't you/anybody eat the cake

Our analysis depends on the assumption that coherent expressions can be represented as a functional product. A function f: D ---> C associates with each object in its domain D a unique object in its co-domain C, written as f: d ---> f(d), where f(d) is an element of C. We treat each of the imperatives as a function taking a tenseless VP to an imperative. Schematically we represent them in a simpler fashion as follows:

(33)   0:   VP ----> IMP
             You/sombody: VP ----> IMP
             Don't: VP ----> IMP
             Don't you: VP ----> IMP
             Do: VP ----> IMP
             Do not: VP ----> IMP

Third, these imperatives can be grouped into pairs under three smaller sets according to polarity, emphasis and whether some are more special than others. Recall that do in imperatives is distinct from supportive do in non-imperatives. Hard as it is to vividly describe the semantic and pragmatic function of imperative do, I subscribe it to the group with do not, which is forceful and formal, under "special" for easier syntactic analysis, hence we have (34)[6]:

(34)   Eat the cake (positive, non-emphatic)
         Don't eat the cake (negative, non-emphatic)
         You eat the cake (positive, emphatic)
         Don't YOU eat the cake (negative, emphatic)
         Do eat the cake (positive, special)
         Do not eat the cake (negative, special)

Fourth, the complex element don't you behaves as a syntactic unit in imperatives. Observe the double negative imperatives:

(35)   Don't not finish your homework before I come back.
         Don't you not finish your homework before I come back.
        *Don't not you finish your homework before I come back.
         Don't you ever not finish your homework before I come back.
        *Don't ever you not finish your homework before I come back.

The sentence is grammatical if the negative word not or ever appears after you but ungrammatical if not or ever appears in between Don't and you. This indicates that Don't you which must bear heavy stress acts as a syntactic unit that resists an intruding element. The syntactic and phonological unity of Don't you suggests that Don't must first combine with you to form a constituent which then acts on the plain predicate VP. This Don't then differs from Don't, Do not

---

[6] Languages like Chinese and Thai employ sentential modal particles to carry the same emotive effect as do. From this perspective it would be possible to treat do as an Aux element.

which act directly on plain predicate VP. The same is true with the limited unexpressed subjects you/somebody.. and the special elment do for special effect, which takes VP directly to make a positive emphatic or a special imperative.

Based on all this, I assign each of the items that take a tenseless VP to an imperative a lexical category. Each lexical category has a set of features, which have been proven necessary when we described the six imperatives above, built into itself (cf. Bach 1983b). The features are [+/-emp] for emphatic/non-emphatic, [+/-neg] for positive/negative and [+/-spe] for special properties such as being formal and forceful associated with do not and such as being cajoled with do. I adopt the convention of specifying only positive values and leaving unspecified features as being associated with a negative value automatically.

(36)

    you = IMP/VP
            +em

    don't = IMP/VP
              +neg

    do not = IMP/VP
              +spe
              +neg

    do = IMP/VP
          +spe

It is easy to see the generality captured by the functor category IMP/VP which takes its argument VP and yields an imperative sentence.

(37) { You/Don't/Do not/Do }   eat   the   cake
              IMP/VP   VP
      --------------------------------------FA
                        IMP

It is also easy to appreciate the advantage of features built into the lexical item which distinguish the differences in the functor categories so that an appropriate imperative may be generated.

(38)a. You   eat   the   cake
        IMP/VP   VP
          +emp
          -------------FA
              IMP (positive emphatic imperative)

    b. Don't   eat   the cake
        IMP/VP   VP
        +neg
        ---------------FA
              IMP (negative unemphatic imperative)

    c. Do not   eat   the cake
        IMP/VP   VP
        +spe
        +neg
        --------------FA
              IMP (negative special imperative)

```
        d. Do      eat   the   cake
           IMP/VP          VP
           +spe
           --------------FA
                IMP (positive special imperative)
```

Since <u>don't you</u> behaves as a unit in negative emphatic imperative construction and this <u>you</u> must be stressed, <u>don't</u> must first combine with the adjacent <u>you</u> which is assigned to the following functor category:

```
(39) you = (IMP/VP)\(IMP/VP)
           +neg          +emp
                         +neg
```

Category (39) represents a function from a negative element to a function from a tenseless VP to an imperative:

```
(40) Don't           you                eat   the cake
     IMP/VP    (IMP/VP)\(IMP/VP)          VP
     +neg      +neg        +emp
                           +neg
     ------------------------FA
                 IMP/VP
                 +emp
                 +neg
     --------------------------------FA
              IMP (negative emphatic imperative)
```

<u>You</u> of category (39) is to be distinguished from the category IMP[+emp]/VP in (36) which is assigned to the emphatic <u>you</u> in <u>You eat the cake</u>, which is a function from tenseless VP to
imperative. Only <u>you</u> of category (39) but not of (36) can take <u>don't</u> as shown in (41).

```
(41) don't       you       eat the cake
     IMP/VP      IMP/VP      VP
     +neg        +emp
     -------------*
```

There are several points to be noted which shows that this system of analysis of imperatives is preferred over the othres.

1. Regarding (42), the grammaticality as well as ungrammaticality of the sentences can be easily explained in this system.

```
(42) *Do you eat the cake
     *Do not you eat the cake
      Don't (you/anybody) eat the cake
```

The only possible category compatible with <u>you</u> is <u>don't</u>, the analysis outlined above captures the fact. It is impossible for <u>do not</u> and <u>do</u> to combine with <u>you</u> of either categories due to the the incompatibility in categorial combination or feature mismatch as shown in (43).

```
(43)a. *Do not      you       eat the cake
        IMP/VP      IMP/VP      VP
        +spe        +emp
        +neg
        -------------* incompatible categories
```

```
    b. *Do              you          eat the cake
        IMP/VP          IMP/VP           VP
        +spe            +emp
        --------------* incompatible categories
    c. *Do not              you              eat the cake
        IMP/VP          (IMP/VP)\(IMP/VP)        VP
        +spe            +neg        +emp
        +neg                        +neg
        ---------------------*incompatible features
    d. *Do                  you          eat the cake
        IMP/VP          (IMP/VP)\(IMP/VP)        VP
        +spe            +neg        +emp
                                    +neg
        --------------------* incompatible features
```

2. Additionally it also explains why (44) cannot be grammatical imperatives when you cannot occur before don't, do not or do:

(44) *you do eat the cake
     *you don't eat the cake
     *you do not eat the cake
     *you/anybody don't eat the cake

This is because of the incompatible categories as given below, no matter which you is used.

```
(45) *You              don't    eat the cake
      IMP/VP                    IMP
      +emp                      +neg
      --------------------*
(46) *You                  don't   eat the cake
      (IMP/VP)\(IMP/VP)            IMP
      +neg      +emp              +emp
                +neg
      ----------------------------*
```

3. This system captures, fundamentally, the particular syntactic properties associated with do and don't which are in the imperative constructions. These elements are different from supportive do, and negative complex don't in non-imperative constructions. Imperative do does not have the supportive force, and imperative don't can take a subject on its right whereas non-imperative can not.

3. Conclusion

I've pointed out some problems facing the analyses of imperatives in the framework of GB. Even though these problems could be accounted for in the future under some adjusted versions of analysis, it would not seem to follow any established principles. A better and simpler method is to treat imperatives as non-derivative from a single structure and to analyze the imperatives as containing different "auxiliary elements" from indicatives. The analysis given here has succeeded in explaining some of the special characteristics of imperative constructions in a simpler and adequate fashion.

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