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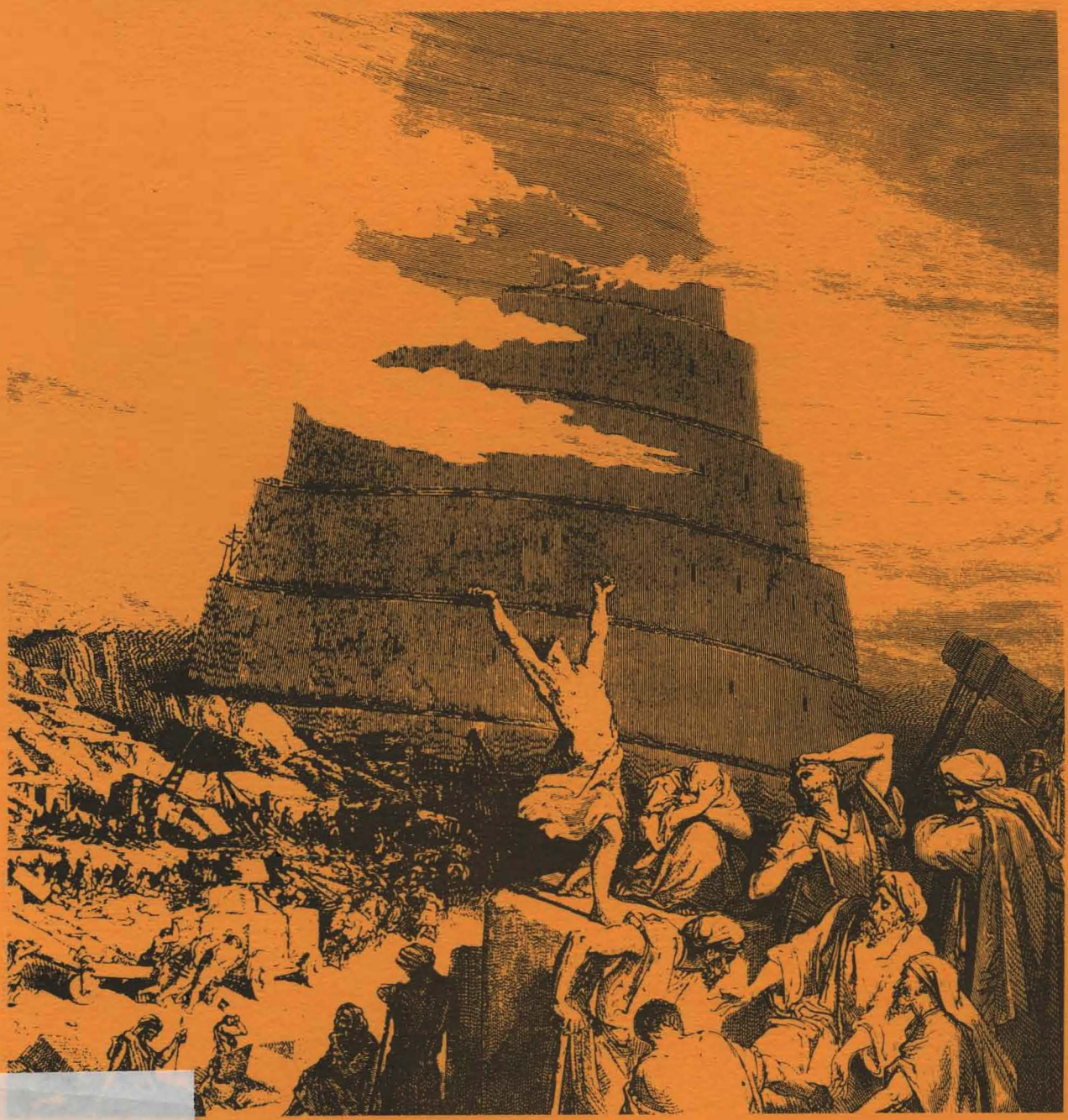

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FOREWORD

The Department of Linguistics of the University of Victoria is pleased to finally present Volume 12 of the **Working Papers of the Linguistics Circle of the University of Victoria (WPLC)**. The articles appearing in this issue represent current research on language and linguistics at the University of Victoria. It is the editorial policy of the *Working Papers* to include an even representation of work by graduate students and established scholars.

Articles published in WPLC are considered working papers, and their appearance here does not preclude subsequent publication elsewhere. As working papers, the articles presented here are subject to reconsideration and revision, and comments regarding their form and content are welcome.

We wish to thank the Department of Linguistics and the Graduate Students' Society of the University of Victoria for their continuing financial support and encouragement.

Although this volume of the *Working Papers of the Linguistics Circle of the University of Victoria* was two years in preparation, *WPLC* is, in principle, published annually by the graduate students of the Dept. of Linguistics. Copies are available free of charge to members of the department and on a continuing exchange basis with other universities. Please address all correspondence to:

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SENTENCE PROCESSING LIMITATIONS IN JAPANESE APHASICS

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1.0. INTRODUCTION

The recent history of aphasiology in Japan has produced an enormous range of both psychological and neurological literature on aphasia (Kawahata et al., 1987; Kawamura, 1990; Sakuma et al., 1989; Tanaka et al., 1987; see also Kess and Miyamoto, in press). Much of this research has focussed on the word as a basic unit, particularly the written word (Besner and Hildebrandt, 1987; Hatta, 1985; Tamaoka et al, 1992). This tendency can be partially attributed to the historical preoccupation of psychology with the word as an accessible unit of measurement in language structure. But in Japanese research it is largely due to the unique relationships between the several orthographical types that Japanese employs, namely, phonographic symbols called *kana* and ideographic symbols called *kanji*, and the generally accepted belief that they involve somewhat different processing mechanisms (Yokayama, 1991).

However, there has been some evidence of a new research trend in which the primary interest is in sentence processing and sentence comprehension (Hagiwara, 1986; 1989; 1990a,b,c; 1991; Hagiwara and Caplan, 1990; Otsu, 1989). This new focus is sufficiently innovative and potentially productive enough to have captured the interest of the discipline of Japanese aphasiology. A common assumption in this new research paradigm is that aphasic syntax differs from that of normal subjects in that aphasics have lost the notion of syntactic hierarchicality. The corollary of this loss of syntactic hierarchicality is that aphasics must depend on some kind of compensatory strategy, one based on linear cues.

This paper questions whether aphasic sentence processing can be characterized as simply having suffered a loss of syntactic hierarchicality. In reviewing previous work, we note that aphasics do seem to maintain certain aspects of syntactic hierarchy and that their limitations in sentence comprehension may just as easily be explained by a limited storage buffer in processing memory. Influenced by recent work on the directionality of syntactic branching (Hawkins, 1990; Dryer, 1992), we attempt to reinterpret recent claims in Japanese explorations in Linguistic Aphasiology, specifically, Hagiwara 1986 (see also Hagiwara, 1989, 1990a, b, c, 1991; Hagiwara and Caplan, 1990) and offer a different explanation for sentence processing limitations in Japanese aphasics.

2.0. APHASIC PROCESSING OF SIMPLE SENTENCES

Hagiwara (1986) focuses on word-order and structural Case asymmetry between nominative and accusative as well as the interplay between lexical vs. syntactic case. First, it is postulated that sentences in the canonical word order of a language are the easiest to process for all speakers of that language, including aphasics (Hagiwara, 1986:45). Thus, the **N-N-V** word order would be easier for Japanese aphasics than the **N-V-N** word order.

Secondly, it is also postulated that case-markers which have a case-assigning function will be utilized by aphasics in interpreting sentences [Hagiwara, 1986:52]. Given Saito's (1985) argument that unlike in English, in which nominative Case is assigned by INF, a functional category, in Japanese, the structural (abstract) nominative Case is assigned by morphological (non-abstract) nominative case itself, Hagiwara speculates that the Case-assigning property of nominative case is more salient than that of accusative case, whose structural abstract Case is assigned by a verb. Thus, for example, aphasics may be more sensitive to nominative Case than to accusative Case, so that, for example, they will dismiss sentences without the nominative Case as ungrammatical, while accepting those without accusative Case as grammatical.

A third assumption concerns the role of lexical vs. syntactic information in case-assignment. It is expected that the distinction between lexically determined case-markers and syntactically determined case-markers will be reflected in aphasics' performance on grammaticality judgments (Hagiwara, 1986:57). The expectation is that because aphasics tend to preserve lexical information over syntactic information, Japanese aphasics will process lexically-determined case better than syntactically-determined case.

Hagiwara (1986) reports a series of experiments with simple sentences designed to test these three assumptions. 30 Aphasics performed two tasks, a grammatical judgment task and an object manipulation task, using two toy animals which correspond to two nouns phrases of specific thematic roles.

The results from the Japanese aphasics showed no difference in ease of processing for canonical and non-canonical word orders. The Japanese aphasics processed both orders of **N-N-V** and **N-V-N** equally well, a finding also reported by Fujita (1977). The one exception to this finding was that the aphasics had difficulty processing a **N-V-N** which was produced when the object was right-dislocated to produce a word order of **N-V-N (Object)**.

1. *kuma-ga zoo-o oshita.* 'The bear pushed the elephant.'

2. *Kuma-ga oshita zoo-o.* (Right-dislocation)

Secondly, the results for the Case-asymmetry between nominative vs. accusative demonstrated that the aphasics were sensitive to the absence of nominative Case, judging sentences without nominative Case as ungrammatical and those without accusative Case as grammatical.

1. Nominative **ga** is missing:
   **Kooen de wa kodomo-tachi-( ) gomihiroi-o shiteimasu.*
   'In the park children are picking up litter.'

2. Accusative **o** is missing:
   Ekiin-ga kippu-( ) kitte-imasu. 'A member of the station staff is punching a ticket.'

Thirdly, the experimental results indicated that aphasics retained the capability to correctly make lexical case-assignments. But their abilities in syntactic case-assignment were said to be severely damaged. For example, in causatives and in the usage of emphatic particles, they commonly made mistakes.

1. Causative:
*Watashi-wa haguruma-o/*ni kaiatensasemashita.* 'I made a gear turn.'

2. Emphatic Particle:
*Katosan-wa yasai-*o-dake tabemashita.* 'As for Mr. Kato, he ate only vegetables.'

These experimental findings are given the following interpretation (Hagiwara, 1986, 1990). Firstly, concerning word-order, aphasics are portrayed as losing their sense of syntactic hierarchicality, and in order to compensate, they rely on the linear strategy of thematic role assignment. Thus, Japanese aphasics should assign the thematic array of **[Agent-Theme]** whenever they encounter the word order of **N-N-V**. Whenever they encounter the word order of **N-V-N**, however, they mistakenly assign the word order of **[Theme-Agent]**. Because of this strategy in thematic role assignment, the aphasics make massive mistakes with sentences containing a **N-V-N(Object)** word order. Instead of the correct assignment of **[Agent-Theme]**, the aphasics wrongly assigned **[Theme-Agent]** to sentences containing a **N-V-N(Object)** sequence.[1]

Secondly, concerning the structural Case-asymmetry, the experimental results do demonstrate that a knowledge of Case-theory was maintained by the aphasics, in that they retained the asymmetry between nominative and accusative Case. Thirdly, concerning the lexical and syntactic case difference, Hagiwara reports that lexically-determined case was retained while syntactically-determined case was damaged.

3.0. APHASIC PROCESSING OF COMPLEX SENTENCES

Hagiwara (1986) reports on an aphasics' comprehension of complex sentences. Ten subjects (two mildly damaged and eight severely damaged patients) participated in an experiment which tested comprehension by object manipulation in response to sentences constructed by mixing clefting, passivization, and relativization. The following is a few of the examples, including the basic simple sentence.

1. Simple Active:
kuma-ga zoo-o oshita. 'The bear pushed the elephant.'

2. Pseudo-cleft Object Relative:
kuma-ga oshita zoo-ga tsukamaetano-wa usagi-da.
'The one that the elephant that the bear pushed caught was the rabbit.'

3. Pseudo-cleft Subject Relative:
Kuma-ga oshita zoo-o tsukamaetano-wa usagi-da.
'The one that caught the elephant that the bear pushed was the rabbit.'[2]

Each of the resulting complex sentences has four NP slots, as exemplified by the formulaic sequence below.

1. *Kuma ga kirin o oshita usagi o nadeta.*
'The bear patted the rabbit that pushed the giraffe.'
Agent Theme V1 Agent Theme V2[3]

Comprehension was measured by whether the aphasics assigned the proper thematic roles to these four NP slots. The results of this experiment may be summarized in a hierarchy of processing difficulty for these complex sentences, as shown in (I) below (Hagiwara, 1986:97).

(I) **Simple Sentences > Cleft > Passives > Conjoined > Relatives**

The sentence types and Mean are listed in the following table. (Hagiwara, 1986: Table 5.7: 97)

1. Simple Active (9.7)
2. Pseudo-cleft Subject (8.5)
3. Psuedo-cleft Object (7.8)
4. Psuedo-cleft Agent Passive (7.3)
5. Simple Passive (7.3)
6. Active Non-canonical (7.2)
7. Psuedo-cleft Subject Passive (7.2)
8. Passive Non-canonical (7.1)
9. Conjoined (6.5)
10. Subject-Object Relative (6.3)
11. Psuedo-cleft Object Relative (5.2)
12. Subject-Subject Relative (4.9)
13. Pseudo-cleft Subject Relative (4.3)
14. Object-Object Relative (2.8)
15. Object-Subject Relative (2.5)

As Hagiwara points out, a significant fact concerning the above result is that embedding per se does not cause difficulty. This fact can, for example, be demonstrated by comparing a (non-embedded) conjoined sentence with an (embedded) subject-object relative clause sentence.

1. Conjoined Sentence:
   Kuma ga zoo o oshite usagi o tsukamaeta.
   'The bear pushed the elephant and caught the rabbit.'

2. Subject-Object Relative Clause-Embedded Sentence:
   Kuma ga oshita zoo ga usagi o tsukameta.
   'The elephant that the bear pushed caught the rabbit.'

As seen in the Table 5.7, between these two types of sentences, there is no significant difference in processing difficulty. Another significant fact, which is related to embedding, is that the sentences which were most poorly-performed by the aphasics were those of Object-Object (OO) and Object-Subject (OS) relative clause sentences; especially, the latter was the most difficult sentence type for them:

1. **(OO)**: *Kuma ga zoo ga oshita usagi o tsukamaeta.*
   'The bear caught the rabbit that the elephant pushed.'

2. **(OS)**: *Kuma ga zoo o oshita usagi o tsukameta.*
   'The bear caught the rabbit that pushed the elephant.'

An interesting fact we should make a note of is that these OO and OS sentences are center-embedded, a branching type which is most difficult to process for any subjects in any type of language, let alone for Hagiwara's subjects.

The same explanation that was given for aphasics' comprehension of simple sentences is given for these results, namely, that thematic role is assigned in a linear fashion. Such **OO** and **OS** relative clause sentences are difficult because the aphasics assigned thematic roles "locally". This local assignment was, however, not compatible with the intended parsing of these sentences, because the sentence-initial NP belongs to a matrix clause, and the two following NP's belong to the embedded clause. This incompatibility between actual sentence structure and the strategy of local thematic role assignment is held out as the reason why there was such a high error rate. Hagiwara explains that "in interpreting OO and OS relatives, patients tend to base their interpretation on the linear sequence of lexical categories, not taking the hierarchical organization of syntactic structure into consideration (1986:101)," and further, that this is because "the use of linear interpretive strategies for sentence comprehension is a language-universal characteristic of aphasics (1986:101)."

There is, however, one inconsistency found in Hagiwara's interpretation of her findings. That is, Hagiwara claims that in comprehending complex sentences, the aphasics abandoned their compensatory strategy based on Case-theory, which was an important heuristic in their processing of simple sentences (Hagiwara, 1986: 103-104). This claim was made to account mostly for the aphasics' processing of the OO and OS relative clause sentences, both of which has the *ga*-marked NP at the sentence onset:

OO relative: [NP-ga ...

OS relative: [NP-ga ...[4]

According to Hagiwara, in both types of sentences, the nominative case-marker **ga** should have been used by the aphasics to correctly assign 'agent' to the sentence initial NP. However, there was a mixed result; the aphasics chose either 'agent' or 'theme'. To account for this mixed result, Hagiwara simply explains that aphasics discard the Case-based strategy when they process complex sentences.

4.0. A PROCESSING EXPLANATION BASED ON LIMITATIONS OF MEMORY BUFFER

We prefer to offer a processing explanation which is based on the limitations of the storage buffer in aphasics' working memory. This explanation resolves the discrepancy between the results for simple and complex sentences, AND allows us to reconcile the fact that Hagiwara's (1986) subjects manifested the same kinds of processing difficulty in dealing with different sentence types as normal subjects do. That is, simple sentences were easiest, while relative clause sentences, especially those involving center-embedding, were the most difficult to process.

Looking closely at the sentence structures involved, it is clear that when the word span required to recognize any local syntactic tree exceeds two words, the results reported for aphasics' sentence-processing deteriorates in direct proportion to the span. This fact squares nicely with observations by Hawkins (1990) that suggests human parsers construct a mother node as soon as possible, and that they begin attaching immediate constituents to that mother node as soon as possible. This principle of **Early Immediate Constituents** postulates that human parsers prefer to maximize the left-to-right Immediate Constituent-to-Word ratios of the phrasal nodes. Very simply, parsing is easier if a parser can see all the sister nodes of a mother in the smallest number of words. Such a principle would predict the difficulty which parsers have with constructions which are center-embedded, as well as our inability to deal with syntactic relationships laid out in a mirror-image branching direction. For example, the processing ramifications of this notion of Early Immediate Constituents (EIC) can be seen in (1) through (4) below (see Hawkins, 1990; Dryer, 1992).

1. A[B C[D E[ ]]]

2. A [C[E[ ] D] B]

3. A [B C[E[] D]

4. A [C[D E[]] B]

In (1) and (2), the recognition of the IC's of A is equally prompt. In both cases, the parser requires only two words to recognize A. That is, in (1), the parser has recognized all the IC's of A by the time that D is encountered; In (2), because a parser does not recognize the first IC of A (which is C) until D is encountered, the number of words it took to recognize all the IC's of A is still just two words. In contrast, in (3) and (4), more than two words are required for the recognition of all the IC's of A. That is, in (3), the second IC of A (which is again C) cannot be recognized until the parser encounters D. The situation is similar in (4), in that a parser cannot recognize the IC's of A until B is encountered. As a result, the processing of the mixed-branching structures in (3) and (4) is harder than the uni-directional structures in (1) and (2).

If we now apply this notion of Early Immediate Constituents to Hagiwara's (1986) experimental results on complex sentences, the results become transparent. The sentences were divided into three groups according to level of difficulty experienced by the aphasic subjects.

1. Easy sentence to process: Simple Active

2. Relatively difficult sentences to process: Pseudo-cleft Subject, Pseudo-cleft Object, Pseudo-cleft Agent Passive Simple Passive, Active Non-canonical, Pseudo-cleft Subject Passive, Passive Non-canonical, Conjoined, Subject-Object Relative, Pseudo-cleft Object, Subject-Subject Relative, and Pseudo-cleft Subject Relative

3. Very difficult sentences to process: Object-Object Relative, Object-Subject Relative

These sentence types can also be divided, however, according to the word span required to recognize and construct their mother nodes. Interestingly, the groupings which emerge are exactly the same as the groupings listed above. Thus, the sentence in category (1) requires no more than two words to recognize its mother nodes. For sentences in category (2), the parser requires at least three words to recognize their mother nodes. And in the case of category (3), the most difficult sentence types, more than four words are required to recognize a mother node.

The clearest case is the simple sentence in category (1).

1. *Kuma ga zoo o oshita*, 'The bear pushed the elephant.'

In this sentence, the parser has an optimum IC-to-mother node ratio (see Hawkins, 1990:236); only two words are necessary in order to recognize its mother nodes. Once the sentence initial NP, [*kuma-ga* 'bear-NOM'] is given, the parser requires only the object NP, [*zoo-o* 'elephant-ACC'] to construct the VP node. Since this is the other IC of the mother node S, this allows the parser to immediately construct the mother node S. Very simply, the sequence of the two words [*kuma-ga zoo-o*] allows the parser to construct the matrix S. Thus, for the recognition of either of the mother nodes, the parser's buffer need not contain more than two words, causing little difficulty in processing. And indeed, this parsing task caused little difficulty for the aphasics.

Next, if we consider the sentences in category (2), there is at least one mother node which requires a three-word span for its recognition. An example of this three-word span is seen in the Subject-Object Relative Clause sentence below.

1. *Kuma ga osita zoo ga usagi o tukamaeta.*
'The elephant that the bear pushed caught the rabbit.'

As we process this sentence from left to right, the two sentence-initial words, [*kuma-ga osita* 'bear-NOM pushed'], does not allow the parser to construct the first mother node of lower S. This is because the object NP, [*zoo-ga* 'elephant-NOM'], which is required to construct the other IC of the lower S (namely, the lower VP) is not available yet. It is only after we encounter [*zoo-ga* 'elephant-NOM'], the raised NP, that the parser can construct the object NP node of the relative clause. And it establishes this object NP node in the relative clause by postulating an Empty Category (EC), as in [*kuma-ga EC-o osita zoo-ga*]. This then allows the parser to construct the lower VP, which in turn allows the parser to construct the lower S. This lower S can only be constructed by the parser after reviewing three words [*kuma-ga osita zoo-ga*].

If we now look at the sentences in category (3), we note that they are either center-embedded sentences or sentences whose initial NP belongs to a matrix clause while following NP's are arguments of an embedded clause. Consider, for example, the Object-Subject Relative Clause Sentence below.

1. *Kuma-ga zoo-o osita usagi-o tukamaeta.*
'The bear caught the rabbit that pushed the elephant.'

In order to construct the mother node of the sentence-initial NP which belongs to the matrix S, the parser must encounter the second IC, that is, the VP which belongs to the matrix S. However, this VP cannot be established until the parser finds [*usagi-o* 'rabbit-ACC']. It is only after encountering this NP which, as the head of the object relative clause, allows the parser to construct the matrix object NP; and this in turn allows the parser to construct the upper VP. Consequently, in order to construct the matrix S node, the parser's buffer must retain four lexical words, namely, [*kuma-ga zoo-o osita usagi-o* 'bear-NOM elephant-ACC push rabbit-ACC']. It was this sentence that was so difficult for aphasics to process; their comprehension of the sentence was no better than chance.

5.0. CONCLUSION

In sum, it might not be a lacking sense of syntactic hierarchicality which is the sole cause of processing failure in aphasics. The source of processing difficulty might lie in the limited span of the buffer they bring to processing memory.

Such an explanation is also compatible with the nominative/accusative asymmetry. Non-canonical case-marking was apparently retained by the aphasics, and this retention of case asymmetry further implies that they are sensitive to the notion of external and internal argument, as well as to the mapping of these arguments into appropriate syntactic configurations. Because the nominative/accusative asymmetry requires an configurational asymmetry, we need not assume that the aphasics have lost a sense of syntactic hierarchicality. We might as easily say that the aphasics' grammar has been impaired in the the limited buffer that is brought to bear in processing memory.

NOTES

1 These findings also seem to establish the VP-constituent as the important processing unit for the Japanese aphasics (and probably for normal subjects as well).

2 Hagiwara does not provide the aphasic types of these patients.

3 These slots are filled in sequence by 'rabbit', 'giraffe', 'bear', and 'rabbit'.

4 The full sentences are listed in the Appendix.

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APPENDIX

1. Simple Sentence:
   Kuma-ga zoo-o oshita, 'The bear pushed the elephant.'

2. Pseudo-cleft Subject:
   Kuma-o osita-no-wa zoo-da, 'What pushed the bear was the elephant.'

3. Psuedo-cleft Object:
   Kuma-ga osita-no-wa zoo-da, 'What the bear pushed was the elephant.'

4. Psuedo-cleft Agent Passive:
   Kuma-ga osareta-no-wa zoo-ni-da,
   'What the bear was pushed by was the elephant.'

5. Simple Passive:
   Kuma-ga zoo-ni osareta, 'The bear was pushed by the elephant.'

6. Active Non-canonical:
   Kuma-o zoo-ga osita, 'The elephant pushed the bear.'

7. Psuedo-cleft Subject Passive:
   Kuma-ni osareta-no-wa zoo-da, 'What was pushed by the bear was the elephant.'

8. Passive Non-canonical:
   Kuma-ni zoo-ga osareta, 'The elephant was pushed by the bear.'

9. Conjoined:
   Kuma-ga zoo-o osite, usagi-o tukamaeta,
   'The bear pushed the elephant and caught the rabbit.'

10. Subject-Object Relative:
    Kuma-ga osita zoo-ga usagi-o tukamaeta,

'The elephant that the bear pushed caught the rabbit.'

11. Psuedo-cleft Object Relative:
Kuma-ga osita zoo-ga tukamaeta-no-wa usagi-da,
'The one that the elephant that the bear pushed caught was the rabbit.'

12. Subject-Subject Relative:
Kuma-o osita zoo-ga usagi-o tukameta,
'The elephant that pushed the bear caught the rabbit.'

13. Pseudo-cleft Subject Relative:
Kuma-ga osita zoo-o tukamaeta-no-wa usagi-da,
'The one that caught the elephant that the bear pushed was the rabbit.'

14. Object-Object Relative:
Kuma-ga zoo-ga osita usagi-o tukamaeta,
'The bear caught the rabbit that the elephant pushed.'

15. Object-Subject Relative:
Kuma-ga zoo-o osita usagi-o tukamaeta,
'The bear caught the rabbit that pushed the elephant.'

ASPECTS OF SPEECH ERRORS IN CHINESE

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1.0 INTRODUCTION

Recent psycholinguistic studies have seen the emergence of a large body of literature discussing speech errors found in the course of normal speech production. Speech production, which involves the process of how a speaker translates information and intention into the language format in a given language, is an active processing procedure of the human mind and is strictly governed by phonological, syntactic and semantic rules. Speech errors are likely to occur when these rules are misapplied. Therefore, speech errors are used as evidence to illustrate the working system of the human mind and the rules that make the system work. Speech errors, a common phenomenon in normal speech, are defined by Sturtevant as an unintentional linguistic innovation, and by Boomer & Laver as "involutary deviation in performance from the speaker's current phonological, grammatical or lexical intention (see Fromkin 1971, 1988). Whatever the real nature of speech errors might be, the study of speech errors has attracted the attention of scholars across the world thoughout history. Apart from the fact that speech errors have been used as a source of humor, serious publications from the Arabic *Errors of the Populace* eleven centuries ago (see Fromkin 1988) to modern works on Spoonerism (e.g., Potter 1980) and "Freudian slips" (e.g., Motley 1985) have hypothesized different theories to account for the speech errors that occur in different shapes and in different languages. Speech errors may appear anomalous, but they do not randomly occur. As Fromkin (1971) points out, these anomalous utterances are really non-anomalous in nature. They in fact fall into a limited set of categories across different languages. This paper discusses the nature of different types of speech errors that are commonly found in Mandarin Chinese and the possible factors that cause these errors.[1] I hope that this initial work will lead to more detailed and systematic research on the topic of Chinese speech error analysis.

2.0 SPEECH ERROR ANALYSIS IN CHINESE

Since speech errors in general can indicate the internal mechanisms of speech production as well as the format of language structure, it is reasonable to assume that speech errors in Chinese can also reflect the common properties of language in general as well as the specific characteristics of Chinese. Like other languages (e.g., English), Mandarin Chinese has its own linguistic units that form the framework of speech according to certain syntactical, phonological, morphological and semantic rules. These rules interact with each other in such a way that speakers of Chinese, with proper application of these rules, make well-formed utterances in communication. Misapplication of these rules, on the other hand, will result in speech errors. These errors can in turn give the insight into how Chinese speech is structured and how the different rules that structure the speech are at work. Speech errors in Chinese occur in very unexpected forms, and quite often, these utterances in obvious violation of the commonly accepted linguistic rules can provoke laughter. Thus, speakers and writers in China have long been using such errors intentionally as a source of humour. However, speech errors were not taken seriously as a subject of study in China

until very recently. I believe that although speech errors appear in different languages and in different shapes, they can be categorized in similar ways to those described by Fromkin (1971, 1973), since the universality of linguistic rules is what linguists suppose and try to prove. A careful analysis of my Chinese error data shows that Fromkin's classification scheme for speech errors can largely account for speech errors in Chinese.

2.1. Substitution

Substitution is a type of speech error in which a speaker plans to say one thing, and somehow something else appears in the speech output. In this type of error, the target utterance (T) and the actual utterance (A) bear strong phonological similarities (similar in sound), and they may also involve semantic relations between the A and T utterances (related in meaning). The speech environment (contextual factors) and the speaker's mental status (psychological factors) also play a role in causing an error. T and A can differ by a word, a syllable, or even by only one phonetic feature (see Fromkin 1971). The following Chinese examples illustrate that speech errors of such a type fall into the above description.[2]

(1) a. bizi --> pizi
'nose' 'leather'

b. xia pao le --> xia pa le
'scared away'

c. wo ma --> wo mao
'my mother'

d. shui kai le --> huo kai le
'the water is boiling' --> 'the fire is boiling'

e. dianshi jia --> dianshi tai
'TV stand' 'TV station'

f. tu dou --> xihongshi
'potato' 'tomato'

The first three examples in (1) are phonological substitutions. In (a), the initial segments of T [b] and A [p] differ only by one feature, the feature of [voiced] or [aspirated],[3] other features of the T and A utterances being unchanged. This suggests that [b] and [p] are paired up phonemically and restored next to each other in the lexicon. The T utterance [pao] in (b) has dropped part of its vowel segment [o], resulting in the error [pa]. This can be considered to be segment omission. In contrast, the error in (c) involves segment addition, adding [o] to the T utterance [ma], making it the eroneous [mao]. (d) and (e) in (10) are obviously semantic substitution errors. This is because in (d), *huo* 'fire' and *shui* 'water' are closely related in the event of "boiling water". while in (e), *dianshi tai* 'TV station' and *dianshi jia* 'TV stand' are related to the object of a TV set. Example (f) shows that T and A utterances both belong to the same "vegetable" category. This is in many ways similar to the analysis on English errors discussed in the literature, such as *spoon* for *fork*, *tree* for *flower*. As Fromkin (1973) explains, the involuntary substitution of the A word for the intended T word shows that the meaning of a word is not an indissoluble whole. The semantic rep-

resentation of a word is a composite of hierarchically ordered semantic features. This is why T and A words are often related one way or the other. This kind of relatedness takes place at different levels (feature, phoneme, syllable and word levels) and on different tiers (e.g., phonological, semantic tiers). Such an analysis clearly explains the data shown above: (a) is an error at the feature level of the phonological tier; (f) is an error at the word level of the semantic tier, and so on. This hierarchical structure of the speech production mechanism is built on crosslinguistic properties as well as language-specific characteristics. There are contextual substitution errors which involve not only the context which the speaker is in, but also the linguistic and cultural background of the speaker. For example, *gaizhang* and *qianzi* in Chinese both mean "to sign", but the former is typically a Chinese tradition in that it literally means "to sign with one's seal," while the latter, "to sign with a pen," describes the signing event that is more practiced in the west. These two words might be stored next to each other in the lexicon of a speaker and are selected for use according to the context. I once caught an error involving these two related words.

(2) xuyao ta gaizh-.....qianzi
'(We) need her to seal... to sign (the document)'

Although the speaker corrected her error immediately after she realized that Western people (in the speech context) usually sign with a pen (but not a seal), the unfinished utterance *gaizhang* was obvious enough to show her temporary confusion in the speech production process, and it is her knowledge of the cultural difference that made her adjusted utterance more meaningful. In general, substitution errors involve phonological, semantic as well as contextual relations between the T and A utterances. They show a structured internal mechanism for speech production with speech units well organized at different levels for selection to form well-formed speech.

2.2. Anticipation

As the very word indicates, the anticipation type of speech error refers to the anticipation of a speech unit (a phonemic feature, a phoneme, a syllable or a word) that should or is expected to occur later in an utterance, resulting in the substitution of one speech unit by another one that should (or is expected to) occur later, other units remaining unchanged. Such errors usually involve the involuntary forwarding of the anticipated segment across a syllable, one or several words, or even across a sentence. Also, apart from the phonological factors that are involved in the anticipation errors, there are also semantic factors that cause the occurrence of errors of this type. The following Chinese examples will show the "anticipating" nature of such speech errors.

(3) a. chun qiu da meng --> qun qiu da meng
'spring-autumn big dream'

b. you zi you wei --> zi zi you wei
'with taste and flavor'

c. chun chun yu dong --> chong chong yu dong
'plan to act with an ill-intention'

d. Sima Guang za gang --> Sima Gang za gang
'Sima Guang broke the jar'

e. ni xi kuaizi le ma? --> ni chi kuaizi le ma?
'Did you wash chopsticks?' 'Did you eat chopsticks?'

Although the erroneous utterances in the above examples are not well-formed, or they may be considered as nonsense in a certain sense, they can still be understood in their respective contexts. In (a), the consonant [q] in the second syllable *qiu* 'autumn' is anticipated and is therefore forwarded to the first syllable, replacing [ch] of *chun* 'spring', resulting in a non-existing lexical item *qun*.[4] In (b) the entire syllable *zi* is anticipated and is thus fronted to replace *you*, resulting in a reduplication utterance *zi zi*. Example (c) shows anticipation of only the feature [back]. In Mandarin Chinese, the only two consonants that can occur at syllable-final position are the dental nasal [n] ([-back]) and the velar nasal [ng] ([+back]). Despite the spelling of *chong* (whose vowel should be phonetically represented as [u]), the only diffeence between *chun* and *chong* is the feature [back] of the syllable-final nasal. It is this particular feature that is anticipated in (c), other features (including the tone) being unchanged. The same kind of feature anticipation also happens to (d), where the unrounded velar stop [g] of the last syllable [gang] 'jar' is forwarded to the initial position of the second syllable *guang*, replacing the rounded *gu* of *guang* (which should be phonetically represented as [g^w]). The anticipation error in (e) is of a semantic nature. I caught the speaker making such an error before I asked what she had intended to say. The T utterance *xi* 'wash' and the A utterance *chi* 'eat' in this context are more related semantically than they do phonologically. That is, when the speaker is articulating one sentence, her mind is already processing the next sentence, relating the action of *xi* 'wash (chopsticks)' to its purpose of *chi* 'eating'. Speech errors of the anticipation type indicate that the human mind processes sentence organization for speech production at a much faster speed than the speech organ can articulate, and this advanced process may influence the actual production of an intended utterance.

2.3. Perseveration

Speech errors of the perseveration type involve the carrying-onward of a segment, a syllable, or even a whole word in an utterance. Like perseveration errors in English, such as "give the boy --> give the goy", a segment of a Chinese utterance can also be carried forward to a later position in the utterance, forcing the segment at this later position to change its features. This segment can be carried across a syllable, a word, or even a sentence, as can be seen in the following examples.

(4) a. ta shoude pi bao gu --> ta shoude pi pao gu
'He is thin to the bones.'

b. fen hong fenghuang --> fen hong hongfang
'pink phoenix'

c. dao jintian zaochen --> dao jintian daochen
'up to this morning'

d. shi shi shi, si shi si. --> shi shi shi, si si si.
'10 is 10, 4 is 4.'

e. ta mai le yiping laochou. huijia yi chi tai xian -->
ta mai le yiping laochou. huijia yi chou tai xian

'He bought a bottle of soya sauce. (When he) got home to taste it, (he found it) too salty'

Examples in (4) show perseveration of different linguistic units. In (a), the feature of [-voice] (or [+aspirated] to some linguists) of the segment [p] in *pi* 'skin' is carried forward across one syllable to the position of [b] in *bao* 'cover', causing the syllable to become [pao]. In (b), the second syllable *hong* 'red' is carried to the next syllable, replacing the third syllable *feng* entirely. Furthermore, the initial segment of the third syllable [f] is further carried to the next syllable, causing the initial segment [h^w] of *huang* to be replaced by [f]. Therefore, a double perseveration in a single utterance resulted in the change of the last two syllables from *fenghuang* to *hongfang*. The examples of (a) and (b) involve a perseveration error across just one syllable, but a perseveration error can also occur across words (more than one syllable). In (c), the syllable-initial segment [d] of the first syllable *dao* is carried across an entire word *jintian* 'today' and is then located at the syllable-initial position of the fourth syllable *zao*, causing it to become *dao*. Example (d) is part of a Chinese tongue twister which is similar to the English "she sells seashells on the seashore --> she shells seasells on the seasore" (see Kupin 1982). If [sh] and [s] are termed A and B, the T sentence of the English tongue twister has a pattern of AB BA BA, which is changed to an AA BB BB pattern due to the perseveration process. Similarly, the Chinese example in (d) has a pattern of AAA BAB which is changed into AAA BBB. In this particular example, the perseverated speech unit is not just the feature, but the entire sound pattern. In (e), the perseverated segment [ou] in *laochou* 'a brand of soya sauce' is carried all the way to the next sentence. All these seem to suggest that the distance between the the landing and the original positions of a "persevering" segment can be across syllables, across words, or even across sentences. The "persevering" speech unit can be a phonemic feature, a syllable or a word.

2.4. Metatheses and Blends

Metathesis, also called Spoonerism, exchange or transposition, is a type of speech error which involves a switch in the linear order of the intended speech units. Such errors as "wasted a whole term --> tasted a whole worm" (see Fromkin 1973) made Mr. Spooner[5] well known to the linguistic world with his special type of errors in language production. The reversal of the two elements involved in such errors can be between two phonemic segments, syllables, and even words. All these can be found in Chinese speech errors, as illustrated in the following.

(5) a. sishi --> shisi
'forty'

b. chi putao bu tu putao pi --> chi putao bu tu pitao pu
'eat grapes without spitting out the peels'

c. zhongguo renmin yinhang --> zhongguo yinmin renhang
'China People's Bank'

d. shou chong ruo jing --> shou jing ruo chong
'feel too much honoured'

e. xian chuan yifu zai kai men --> xian chuan men zai hai yifu
'put on clothes before opening the door'

It is clear that, in the above examples, [sh] and [s] in (a) have exchanged the feature [anterior], it is therefore a phonemic feature metathesis. The two vowels in (b), i.e., [u] in *putao* 'grape' and [i] in *pi* 'peel', have methathesized, resulting in the exchange of vowel segments in two different syllables. Examples (c) and (d) involve whole syllable[6] exchange (e.g., [ren] of *renmin* 'people' vs. [yin] of *yinhang* 'bank'). Example (e) shows the metathesis of whole phrases (*chun yifu* 'to put on clothes' vs. *kai men* 'to open the door').

Note that in the above examples, the A utterances are mostly ill-formed semantically, that is, the metathesized sentences can be quite strange and meaningless. This is because the metathesized segments usually do not belong to the same semantic category. Phonological exchanges will also result in the change of meaning of the words involved. However, there is one kind of metathesis that does not make any difference between T and A utterances. Consider the following metatheis error.

(6) a. ru chi ru zui --> ru zui ru chi
'like crazy, like drunk'

b. wan zi qian hong --> qian hong wan zi
'very colorful'

These utterances are both grammatically and semantically well-formed whether or not metathesis occurs. It is therefore difficult to tell if a speaker is making an error in her speech. I recorded the errors in (6) when the speaker was reading the written T sentence while producing the A sentence. It seems that the speaker's knowledge of the variable grammatical structure of these sentences can sometimes influence the normal speech production under such circumstances.

In some Chinese proverbs such as (5d), the meaning of each monosyllabic word is so precisely fixed within the grammatical domain that an exchange in word position will make the utterance totally unacceptable. In general, these proverbs consist of a fixed number of words and people are so familiar with them that it is more likely that a word switches with only other words in the same phrase, but not outside the fixed set. This is a special characteristic of Chinese errors which may not be found in errors in languages such as English. Another point that should also be made clear here is that, unlike English, in which consonant clusters form natural phonological units, Mandarin Chinese does not have consonant clusters. Therefore, errors of any type involving consonant clusters do not exist in Chinese, at least not in my data.

As discussed above, metatheses or exchanges occur not only at phonemic or syllabic level, but at the word level as well. Garrett (1980) claims that if words are exchanged, they are usually some distance apart and of the same part of speech, but if sounds are exchanged, they tend to be close together and are between different parts of speech. Thus, it appears that the speech plan for words is earlier in the planning sequence than the plan for sounds. Garrett's observation may not prove totally true in Chinese speech errors. The exchanged words in the following examples do not belong to the same part of speech.

(7) wo jidong de hua dou buhui shuo le --> wo jidong de shuo dou buhui hua le
'I am too excited to say a word'

(8) wode fei dou yao qi zhale --> wode qi dou yao fei zhale
'My lung is angered to the extent of explosion'

In the above examples, the exchanged words in each sentence are not of the same part of speech (*shuo* 'say' is a verb and *hua* 'words' is a noun in (7): *qi* 'to anger' is a verb and *fei* 'lung' is a noun in (8)). This is certainly contradictory to Garrett's claim. A possible explanation for this kind of exception would be that most monosyllable "sounds" can be morphologically an independent word. If metathesis happens between such monosyllable words, it could just be regarded as "sound exchange" which does not "require" the identicalness of part of speech. This explanation also suggests that there are many different types of exchanges, and that the speech plan is quite versatile, capable of incorporating information from many levels (see Paivio & Pegg 1981).

Chinese speech errors can also occur in the form of blends. As Fromkin (1971) describes, blends occur in which non-existent words are produced as the result of composites of two words with similar semantic features. This is true in languages like English, such as *switch/changed --> *swindged* (see Fromkin 1971). In Chinese blends, on the other hand, an existing word can be generated with composites of two words. Although the blended word can still be meaningful, it is usually totally different from what is targeted. The following examples from my data illustrate the point.

(9) a. bāozi/jiǎozi --> biǎozi
'Chinese dumplings' 'prostitute'

b. shengyiren/shangren --> sheng ren
'businessman' 'stranger'

c. jiaowang/jiechu --> *jiaochu
'interaction'

d. zucheng/xingcheng --> *zuxing
'to form'

As shown in (9a), the speaker has blended [b] of [baozi] and [iao] of [jiaozi], resulting in the blend error of [biaozi]. (9b) shows that the speaker has blended the first syllable of one word with the last syllable of another, resulting in a non-matching combination. On the other hand, the blends in (c) and (d) are by no means comprehensible and thus cannot be accepted. But these examples show one thing in agreement with Fromkin's assumption that the two words to be blended have the same semantic features. For example, both *shangren* and *shengyiren* mean more or less the same thing: 'business person', the same is true with *jiaowang* and *jiechu*, both of which have the meaning of 'to interact with...'. Speech errors of the blend type in Chinese show that they bring together parts of two different lexical terms within the same semantic category. These blended parts can be either parts of a syllable or parts of a word. The result of such blending can be a non-existing lexical item or an item that does not fit into the speech context.

2.5. Speech Errors in Stress and Tones

Speech errors can also appear in the form of stress and tone misplacement. As Cutler (1980) argues, a correctly produced sentence involves the successful imposition of suprasegmental features at several points including the assignment of primary lexical stress to the correct syllable of polysyllabic words and the correct placement of stress within a phrase, a clause or a sentence in a language like English. In addition, the correct speech should also involve the correct placement of tone in a tone language like Chinese. In real speech, however, errors arise at each of the above decision points. And, like errors of other kinds, stress/tone errors do not just occur at random, and there is a certain degree of detectability. Consider the following English examples:

(10) a. I put things in that abstráct that I can't justify.
(T: ábstract)

b. You are in a real advántag-- advantágeous position.

c. In his life, there seems to be ambíguty.
(T: ambigúity)

In the above examples, (10a) shows an obvious correlation between the error and the target word: same spelling, different stress positions (hence different parts of speech, N. vs V.). In (b), the erroneous stress has been detected and the error corrected before the utterance is complete. However, it is still clear that the speaker has had the word "advantage" in mind while planning to produce "advantageous". The stress shift in (c) appears to be the result of the error of syllable omission, which still shows "ambiguous" as the underlying word in the speaker's plan. In general, the location of the misplaced stress in these examples appears to be not at all random, and they seem to imply that stress misplacement in each case suggests another existing word, which is closely related to the target word in both form and content (See Cutler 1980). This in turn seems to support the assumption that lexical items in the mental lexicon are stored in groups of roots and their different derivatives. Errors in stress and intonation over phrases and sentences are quite common in spoken English (See Fromkin 1980).

Mandarin Chinese is a tone language in which each morpheme consists of a single syllable, and tone is used to contrast individual lexical items. The dictionary entry of each morpheme must specify which of the four tones it has, namely: Tone 1 (¯) high level, Tone 2 (´) high rising, Tone 3 (ˇ) low dipping and Tone 4 (`) high falling (see Chao 1968 among others). Tone in Chinese is just like any other phonemic feature in the language, and it groups and differentiates lexical items both semantically and phonologically. A tone error in spoken Chinese, like the stress error in English, may also suggest the relationship between the target utterance and the actual utterance in speech planning. The following examples from my data show how speech errors in Chinese are caused by tone difference.

(11) a. wǒ yá téng/tòng --> ...tóng
'I have a toothache'

b. fěn hóng fēng huáng -->
fén hǒng fēnghuáng
'pink phoenix'

c. dá(rǎo)..., dǎduǎn nǐ le
'(sorry) to stop you (from thinking)'

To a native Chinese speaker, the erroneous utterance *tông* in (11a) is certainly improper in such a context. But it seems to show that the speaker had two semantically related words -- *téng* and *tòng*, both meaning 'painful' -- in the selection list while planning and, by mistake, has used the sound of one choice and the tone of the other. This could also be considered a blend between a vowel and a tone. In (11b), it is obvious that the tones of the first two syllables have switched their positions, resulting in the error of tone metathesis. A possible explanation for this error could be that the speaker has in mind another utterance *hông fěn* 'reddish pink' while intending to produce *fěn hông* 'pinkish red', and the tone of the former affected the production of the latter, and thus the error occurred. The speaker of (11c) was hesitating between *dǎ rǎo* 'disturb' and *dǎ duǎn* 'cut short'. According to Chinese phonological rules, a Tone 3 syllable becomes Tone 2 when followed by another Tone 3 syllable, hence [dǎ] in *dǎ rǎo* 'disturb' should be pronounced with Tone 2 [dá]. But once the first syllable of *dǎ rǎo* 'disturb' is produced, the speaker realized that what she actually wanted was the word *dǎ duǎn* 'cut short', and she immediately switched to her correct choice. In other words, the same syllable [da] in different words can have different tones, and this difference can influence people's normal speech and cause speech errors in tone.

2.6. Speech Errors and Chinese Syntactic Structure

Although the theory of Universal Grammar believes that languages are the same everywhere in the world in terms of their very basic structures which can be captured within a set of principles, the language-specific syntactic differences between languages (e.g., English and Chinese) are still obvious. Such differences can also be reflected in the speech errors in respective languages. As Fromkin (1988) points out, the most commonly occurring speech errors are those which produce grammatically ill-formed sentences. These errors may result from sentence blends or wrong rule application. Fay (1980) describes such errors (e.g., *Why do you be an oaf sometimes?*) as "transformational errors". In Fay's analysis, a speaker has to follow a set of transformational rules to produce grammatically well-formed sentences. A wrong step in the application of these ordered rules will lead to syntactic speech errors. Similarly, Chinese speech errors can also mirror the syntactic structure of the Chinese language.

One of the major differences between English and Chinese grammatical structures is that Chinese has a topic-comment sentence structure (Li & Thompson 1981) while English does not. Also, Chinese is a pro-drop language in which a pronoun can be dropped from either a subject position or an object position in the proper context, while English requires all pronouns to be fully indicated For example, a Chinese sentence like (12) can be uttered in the form of either (13) or (14) while the meaning and the wellformedness remain unchanged.

(12) ni chi fan le ma?
you eat meal perf. Q
'Have you eaten your meal?'

(13) EC chi fan le ma?
eat meal perf. Q
'Have you eaten your meal?'

(14) fan, EC chi le ma?
meal EC eat perf. Q
'Have you eaten your meal?'

The subject pronoun *ni* 'you' is dropped from its position in (13), leaving an empty category (EC) in the gap, which results in a "subjectless" sentence; and (14) is the topic-comment structure with *fan* 'meal' as the topic and *EC chi le ma* as a subjectless comment. These two sentences are both well-formed and they represent different syntactic structures in Chinese which are distinct from those of languages such as English. However, it is this structural variation that may cause speech errors of the syntactic type. The following example from my data shows an erroneous combination of the two structures.

(15) fan, EC chi le ma? / EC chi fan le ma? --> *fan, chi fan le ma?
'Have you eaten your meal?'

Obviously the error is caused by misapplication of grammatical rules. If it is assumed that a Chinese sentence like (14) is derived through different steps by different rules, the transformation could be something like the following.

(16) ni chi fan le you eat meal per.	Normal sentence order (Underlying form)
ni chi fan le ma?	Questionization
fan, ni chi le ma?	Topicalization
fan, EC chi le ma?	Subject pronoun dropping

If this assumption is correct, it can be further assumed that the erroneous (15) is the result of misapplication of one of the above mentioned rules. In a Chinese sentence, when a word or constituent is topicalized, it is moved from its original position to the beginning of the sentence, leaving a gap behind. This rule of topicalization is misapplied, causing (15) to occur, as shown below.

(17) ni chi fan le you eat meal per.	Normal sentence order (Underlying form)
ni chi fan le ma?	Questioning
*fan, ni chi fan le ma?	Topicalization (misapplied)
fan, EC chi fan le ma?	Subject pronoun dropping

Comparing the above examples with the English syntactic errors discussed in the literature (see Fay 1980), it is clear that there are different syntactic rules to be applied to form grammatical sentences. These rules may be language specific and vary across languages, but misapplication of these rules will result in the same type of speech errors -- syntactic errors.

3.0 FURTHER DISCUSSION

It has been shown that speech errors in Chinese are in many ways similar to those found in English in terms of the basic structures of T and A utterances. Chinese speech errors, on the other hand, also show the linguistic characteristics not found in English (errors in tone, in syntactic structure, etc). One may suggest that English speakers will plan their speech in English when speaking, following the English linguistic rules, and Chinese speakers plan in Chinese, following the Chinese linguistic rules. One natural question that will arise is whether the knowledge of both languages will make English-Chinese bilinguals think in both languages simultaneously when speaking. From my own observation, one's knowledge of two languages seems to influence the normal speech in either language. It is possible that certain lexical items in one language are stored together with the corresponding items in the other language in the speaker's lexicon, provided that these items of the two different languages are of the same grammatical category. For example, speech production in one language can be greatly influenced by one's knowledge of the syntactic structure of another language. Consider the following example.

(18) wo kaiche song ni qu xuexiao --> wo kai ni qu xuexiao
'I will drive you to school'

What (18) shows may be considered as an omission of a few words, but a careful analysis will prove that it is the result of misapplication of English grammatical rules to the production of the Chinese sentence. The speaker took the Chinese verb *kai* 'to drive' (which subcategorizes for a means of transportation as its direct object in this case) as the equivalent to the English verb *drive* (which, in this case, implies both the use of the vehicle and the service to the passenger). The erroneous A utterance of (18) can be literally translated as "I will go to school by driving you (as a means of transportation)". Such crosslinguistic interference seems to suggest that certain lexical items in one language are stored together with the corresponding items in another language in the speaker's lexicon. These items in the two different languages may be of the same grammatical category, but are selected for speech production through different grammatical rules in their respective languages.

Phonological similarities between two items in one language may also influence the the production of the corresponding items in another language. For example, the Chinese terms *tudou* 'potato' and *xihongshi* 'tomato' in (1f) have no phonological similarity and thus cannot be phonologically related. It is hard to explain why of all the vegetables only *xihongshi* is selected to replace *tudou* if they are just semantically related. However, if we look at the phonological representation of their English equivalents (i.e., *potato* and *tomato*, which bear strong phonological similarity), it is clear that the speech error is more likely to be caused by the interrelationship between T and A at the level of an interfering language (English, in this case). Therefore, it can be suggested that speech errors reflect the relationship between T and A not only within one language (L1), but also in another language (L2) that the speaker is familiar with. Another example from my data further shows the interference of L2 on L1.

(19) jiezhi fang de tai duo --> jiezhi pu de tai duo
'(I) put too much lubricant'

The difference between T and A in (19) is with the verb *fang* 'to put' which is replaced by the sound [pu] in the A utterance. There hardly seems to be any relation, either in sound or meaning,

between [fang] and [pu] in Chinese, but the recognition that [fang] in Chinese and [pu(t)] in English both are verbs that mean "to locate something somewhere" helps understand that the Chinese item *fang* is replaced by its English equivalent *put*, thus the error. This example clearly shows that one's knowledge of one language can influence the normal speech production of another language.

4.0 SUMMARY

This paper has discussed speech errors of different kinds that occur in Chinese in comparison with those found in English, each showing certain aspects of the relation between the human mind and the human tongue. Speech production involves simultaneous planning at many levels. At the lowest level are expressive elements, or phonetic features, and, at the highest level is the speaker's idea or intention that determines what to produce. The idea is realized or expressed through the elements which are organized in a particular order. This multi-leveled speech organization incorporates articulatory features into higher level units such as words, phrases and sentences. Examples of speech errors in this paper show that speech is organized on many levels, and some of the units of speech that will appear later in the speech stream are cognitively available earlier on, even to the extent of interfering or competing with the intended units (See Paivio and Begg, 1981). Speech errors like anticipation and perseveration also show that speech is not simply a one-word-at-a-time plodding activity, but rather, the mind skips ahead, sometimes well in advance of the tongue.

Speech errors in different languages may appear in different shapes. Errors in English can occur as misplacement of consonant clusters and stress while in a tone language like Mandarin Chinese, speech errors can involve shifts or exchanges of syllables and tones. However, most of the types of speech errors are shared by both languages. Bilingual speakers tend to apply the linguistic rules of both languages in the course of speech production, and it is likely that the two sets interfere with each other. It could therefore be concluded that speech errors in spoken language in general do not occur at random, and they show that people think and plan before they start talking. The plan is not at one single level, but rather at the levels of basic phonological features, such as the placement of vowels, consonants, consonant clusters, stress and tones, as well as at higher levels such as words, phrases and sentences. Different types of speech errors also show, in a much broader sense, that the human mind, like a sophisticated computer, but much more complex, works in a multi-dimensional and multi-level interaction in the planning and organizing of speech production.

NOTES

1 I owe my small data collection to my wife and other Chinese speaking friends who have carefully recorded the speech errors that they themselves have experienced or heard other people make.

2 The Chinese examples in this paper are given in the Romanized *hanyu pinyin* transcription used in the People's Republic of China. Tone markers are not applied to the examples unless speech errors in Chinese tones are discussed.

3 Many Chinese linguists argue that in Mandarin Chinese, what some call [b], [d], [g] are in fact unaspirated [p], [t], [k] respectively (see Chao 1968).

4 In a Mandarin Chinese dictionary, the phonetic representation of [qun] carries lexical meaning only when it has a second tone, but not with any other tones (unless in old written Chinese). Speech errors in tone will be discussed in a later section.

5 The Reverend Dr. William Archibald Spooner (1844-1930) was a lecturer, tutor, dean and Warden of New College, Oxford. In spite of being a good administrator as well as a scholar by any standard, Spooner is well known for his special type of speech errors in both oral and written forms which have attracted many researchers to the study of the mechanism of speech production. See Potter (1980) for a detailed introduction.

6 In Chinese, many words have just one syllable, and therefore syllable exchange sometimes can be regarded as word exchange.

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PROSODIC STRUCTURE AND REDUPLICATION IN THAI

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1.0 INTRODUCTION

Thai, a member of the Sino-Tibetan language family, is the standard spoken and literary language of Thailand and is specifically used in Bangkok and its environ. Thai words are predominantly monosyllabic; however, many are polysyllabic. Inflection is completely lacking in Thai but derivation is well-developed; reduplication is certainly one of the language's most productive word-formation processes.

In this paper, I will account for various kinds of reduplication in Thai within the Prosodic Morphology framework proposed by McCarthy and Prince (1986). McCarthy and Prince propose the theory of Prosodic Morphology, a templatic representation system which attempts to account for various allomorphs by means of a shape-invariant that is prosodic in nature, without any reference to segments. I will argue in this paper that this theory provides a successful way of accounting for reduplication in Thai, one of the language's most productive word-formation processes. The theory can explain the occurrence of various forms of reduplicative affixes such as CVC, CCVC, CVVC and CCVVC. Ablaut, the alternations of vowels or consonants found in the resulting forms of reduplicative words, can also be nicely handled by means of melodic overwriting within the framework of Prosodic Morphology. Since this framework depends on a prosodic description of the language, the prosodic constituents are discussed in section 2. In section 3, the theory of Prosodic Morphology will be sketched and the analysis of Thai reduplication will finally be offered in section 4.

2.0 THE PROSODIC STRUCTURE OF THAI

2.1 A Brief Sketch of Thai Phonology

There are twenty-one consonant phonemes in Thai (/p p^h b t t^h d c c^h k k^h ʔ f s h l r m n ŋ j w/). Of those twenty-one phonemes, only /p t k ʔ m n ŋ j w/ can be final consonants.[1] Moreover, there are nine vowels with distinctive length (/i i: e e: æ æ: ï ï: ə ə: a a: u u: o o: ɔ ɔ:/) and three diphthongs (/ia ïa ua/). Of equal significance are five contrastive tones (high [ˊ], low [ˋ], mid = unmarked, rising = ˇ and falling = ˆ) which are used to distinguish lexical meaning.

Constraints on the distribution of these lexical tones depend on syllable structure. All five tones may occur on open syllables or on closed syllables ending with a sonorant. On syllables that consist of a long vowel followed by an obstruent, only the low and falling tones are allowed. On syllables containing a short vowel followed by an obstruent, only the low and high tones are permitted. The distribution of Thai tones is summarized in the table below:

Table 1: Summary of Thai Tones

Syllable Structure	Lexical Tones				
	high	low	mid	falling	rising
C(C)VV	X	X	X	X	X
C(C)VS	X	X	X	X	X
C(C)VVS	X	X	X	X	X
C(C)VO	X	X	-	-	-
C(C)VVO	-	X	-	X	-

2.2 Theoretical Issues in Syllable Structure

There have been a number of proposals concerning the internal structure of the syllable. These proposals differ with respect to whether they recognize a rime constituent or a flat syllable structure (Hyman (1985)). In both theories, the phonological weight of a syllable is expressed by its internal build-up. According to the theory that recognizes a rime, a light syllable is defined as one whose rime does not branch, and a heavy syllable as one whose rime does branch. Thus, in order to establish the weight of a syllable, only its rime is 'projected' and the heavy$_2$ vs. light distinction is redefined as one between branching vs non-branching, as illustrated in (1):

(1) a. Light Syllable b. Heavy Syllable

On the other hand, the theory recognizing a flat syllable structure depends on the number of moras to express the weight distinction. It is this theory of internal syllable structure and prosodic weight on which my analysis is based. In the moraic approach, a light syllable consists of one mora whereas a heavy syllable comprises two moras. The status of the syllable onset has different interpretations. For instance, Hyman (1985) and Davis (1990) consider the onset moraic since it is adjoined to a mora position. I, however, follow McCarthy and Prince (1986) and Hayes (1989) in considering the onset to be non-moraic; the onset is attached to the syllable node. This second moraic approach to the internal syllable structure is displayed in (2):

(2) a. Light Syllable B. Heavy Syllable

As (2) illustrates, a mora has a dual role: it serves as a position of autosegmental association as well as a weight unit. Generally, vowels associate to moras while weightless consonants associate to the syllable node. The mora with its dual role is developed by McCarthy and Prince (1986) as the centre of their theory of Prosodic Morphology.

2.3 Thai Syllable Structure

Thai syllable structure is of the form C(C)VC, C(C)VV, and C(C)VVC where VV is either a long vowel or a diphthong. The onset is obligatory: any consonant or a maximum of two consonants can fill the onset position. The possible clusters are as follows: /p p^h t t^h k k^h/ followed by /l r w/; /t t^h/ followed by /r/ and /w/; /k k^h/ followed only by /w/; and /s/ followed by stops. In the syllable coda, on the other hand, only a restricted set of segments may occur, namely /p t k ʔ m n ŋ j w/.

Over the years, the question concerning the maximum number of moras a syllable can contain has been addressed. In most current theories, the maximum syllable weight is said to be bimoraic (Hyman (1985) and McCarthy and Prince (1986)). However, with a few pieces of convincing evidence from compensatory lengthening and stress, Hayes (1989) and Macken (1990) suggest that trimoraic syllables exist. Following them, I will argue in this section that trimoraic syllables also exist in Thai. The evidence is from the language stress pattern.

In Thai, a syllable consists of one, two, or maximally three moras. A monosyllabic word is obligatorily bimoraic or trimoraic. The only time monomoraic syllables occur is in polysyllabic words in a fast speech style. The first syllable of a bisyllabic word or the first and second syllables of trisyllabic words may contain one mora if it ends in a glottal stop. When the glottal stop is dropped, the tone is alway neutralized as mid. This phenomenon is shown in (3):

(3) a. tàgs.ko:n ---> tako:n 'to shout'
b. sāʔhāʔrát ---> saharát 'The United States'
c. ráʔmátráʔwaŋ --> ramátrawaŋ 'careful'

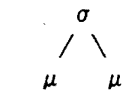
After the syllable is defined, each element of the nucleus and coda positions is assigned one mora. Following the assignment of moras, onset is attached to the syllable node. For example, in C1VC2, the syllable contains two moras whereby V takes up one mora and C2 takes up another mora and C1 is linked up to the syllable node.

Since the coda position is assigned one mora, the final consonant must be recognized as moraic regardless of how sonorous it is. The evidence supporting this can be drawn from compensatory lengthening in reduplication as well as from insertion of a glottal stop in Indic loanwords in Thai. For example, consider the word *krāʔsík* ---> *krāʔsíkkrāʔí:* 'mirthfully'. If /k/ is understood as

moraic, then vowel lengthening is easily accounted for. That is, when k deletes, the mora position is left empty, and subsequently the vowel i lengthens to fill that mora position. If the k is non-moraic, compensatory lengthening would not be motivated. Similarly, a glottal stop is obligatorily inserted if the Indic loanwords end in high short vowels, e.g. Pali *sati* ---> Thai *satiʔ* 'mindfulness' (Miyamoto (1992)). Again, this shows that ʔ is moraic; otherwise, the syllable structure constraint that one mora is not allowed in a final syllable would be violated.

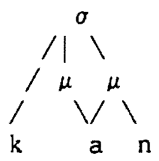
Miyamoto (1992) proposes the syllable template for Thai shown below:

(4)



In postulating this bimoraic syllable template, he assumes that there is no moraic weight distinction between CVC and CVVC. That is, Thai does not have super-heavy syllables, conforming to the general assumption by Hyman (1985) that the maximal weight of a syllable is universally two moras. Therefore, for Miyamoto, the syllable structure of the word *ka:n* 'maker' will look like that in (5):

(5)



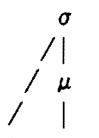
Miyamoto does not give any evidence supporting his argument or the internal syllable structure in (5). Moreover, since vowel length is distinctive in Thai, it seems contradictory that the language does not have weight distinction between V and VV when they are followed by a consonant. On the other hand, if we posit that Thai distinguishes heavy syllables from super-heavy syllables, the distinction between CVC and CVVC can be captured. In fact, the language has to recognize trimoraic syllable structure for the sake of stress. In Thai, stress depends on the weight of the syllable; in non-derived forms, a super-heavy syllable takes the main stress, as illustrated in (6):

(6) Stress Pattern

a. 'wæ:w'wa:w	'bright'
b. pʰi:'pʰă:m	'to be hasty'
c. 'jæ̂:pjon	'ingenius'

To sum up, Thai has monomoraic light syllables, bimoraic heavy syllables and trimoraic super-heavy syllables. The representation of Thai syllable structure is given in (7):

(7) a. Light Syllable

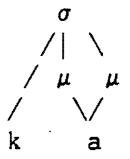


tako:n 'to shout'

b. Heavy Syllable

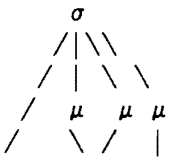
'to estimate'

c. Heavy Syllable



'raven'

d. Super-Heavy Syllable



'body'

3.0 PROSODIC MORPHOLOGY

The main idea of Prosodic Morphology is that templates that are relevant for morphological processes are defined in terms of the authentic units of prosody. According to McCarthy and Prince (1990), these are: mora (μ), syllable (σ), foot (F), and prosodic word (W). In other words, Prosodic Morphology recognizes those entities as the only legitimate targets for a process like reduplication. This view is different from the CV-skeleta theory of Marantz (1982) since the latter takes segments to be the target of reduplication.

Another difference between the two theories lies in the way they treat allomorphs of reduplicative morphemes. The CV-theory must set out the reduplicative template as the longest observed realization and must then discard empty template slots after the melody has been mapped onto the target frame. Prosodic Morphology, however, assumes that empty templatic slots do not exist; it can define the template as, for example, the syllable which includes in it all possible syllable shapes allowed in the language, and hence, does not have to discard unassociated elements. This is one of the reasons that Prosodic Morphology will have more success than the CV-theory in handling Thai reduplication. The CV-theory cannot adequately account for the full reduplication of words or morphemes which occur in the language since they may have different CV-skeleta. The Prosodic Morphology process copies an entire Thai prosodic word including tones. The template representation system accounts for various allomorphs by means of a shape-invariant that is prosodic in nature, without any reference to segments.

Like proponents of the CV-theory, however, McCarthy and Prince still assume that the entire segmental melody of the reduplication domain is copied onto a new plane. Also, mapping of the segmental material into the template is directional: in unmarked cases, left-to-right for prefixes and right-to-left for suffixes and free choice for root-and-pattern systems. For reduplicative affixation, they assume edge-in reprosodization, by which the affix occurs at an edge. That is, in unmarked cases, prefixes reprosodize at the beginning and suffixes at the end of the domain.

There is another difference between CV-theory and Prosodic Morphology. In Prosodic Morphology, association is assumed to be template-driven in the sense that the phonemic melody is parsed by the affixal template. In the CV-theory, on the other hand, association is assumed to be phoneme-driven whereby the melody elements are matched one by one to the template. In both cases, association is subject to the Well-formedness Condition which states that association lines may not cross and no elements may be skipped.

In addition to the basic apparatus of the framework that I have outlined, "Melodic Overwriting" is another part of Prosodic Morphology which will play a key role in the analysis of Thai reduplication. In certain types of reduplication, a portion of the reduplicative affix has a fixed melodic shape regardless of the base melody. In CV-theory, these cases will be treated by means of "Prespecification" whereby a particular feature is associated to a position in the template. McCarthy and Prince argue against prespecification in the light of 'echo' words in English such as table-shmable, book-shmook, and so on. Since the echo word phenomenon is a result of full reduplication, no template can be determined, and as a consequence, nothing can be prespecified. As an alternative, McCarthy and Prince propose melodic overwriting in which a feature changing association overwrites the original melodic material copied from the base. Thus, in the echo word table-shmable, shm overwrites t, then the templatic melody shm associates with the onset of the syllable template and the t is subsequently delinked.

4.0 REDUPLICATION

4.1 Types of Reduplication in Thai

Reduplication in Thai is total. That is, the process copies the whole phonological word, including tones, from the base. The evidence supporting this claim comes from forms like *di:di:* 'very good' (from *di:*), *wæ:wwa:wwæ:wwa:w* 'bright' (from *wæ:wwa:w*) and *ʔā:nʔā:n* 'read continuously' (from *ʔā:n*) where, after the process of reduplication, long vowels and the low tone occur in both the base and the reduplicative affix.

Recall that reduplication is one of the most productive word-formation processes in Thai. In fact, it has been observed that every grammatical word-category can be reduplicated. Tentatively, there are four main types of reduplication in Thai: simple reduplication, emphatic reduplication, negative reduplication, and evocative reduplication. 4.1.1 Simple Reduplication

Simple reduplication copies the whole base. That is, a copy is generated that looks exactly the same as the base. Simple reduplication can operate on words of different classes and will trigger some change in the meaning of each word. For instance, the reduplication of a noun changes the quantity from singular to plural;[3] that of an adjective shows generality; that of an adverb adds to intensity; that of a verb indicates the continuity of an action; and that of a classifier exhibits distribution of an action. Examples of simple reduplication are shown below:

(8) a. dèk 'child' ---> dèk'dèk 'children'
b. nâŋ 'sit' ---> nâŋ'nâŋ 'sit continuously'
c. di: 'well' ---> di:'di: 'very well'
d. bæ:n 'flat' ---> bæ:n'bæ:n '(sort of) flat'
e. nâ: 'page' ---> nâ:'nâ: 'page by page'

Considering the examples in (8), it is difficult to predict whether the copying process is prefixal or suffixal due to the full reduplication. However, a consistent stress pattern is evident; the main stress falls on the second syllable of the reduplicative forms whereas the secondary stress falls on the first syllable. Thus, it seems reasonable to claim that, with simple reduplication, the process is prefixal in which case the base receives the main stress and the affix gets the weak one. In the reduplicative form of bisyllabic bases, the main stress is assigned on the antepenultimate and last syllables, but the stress is a little stronger on the last one, e.g. *nâ:râk* 'cute' ---> *nâ:'râknâ:'râk* '(sort of) cute'

4.1.2 Emphatic Reduplication

Like simple reduplication, emphatic reduplication copies the entire base. This reduplicative affix is a prefix with a fixed high tone. Emphatic reduplication only operates on verbs, adjectives, and adverbs to add emphasis to the words. With emphatic reduplication, the main stress is assigned on the base, whereas the prefix receives the secondary stress. Instances of emphatic reduplication are given below:

(9) a. c^{h}ɔ̂p 'like' ---> c^{h}ɔ́p'c^{h}ɔ̂p 'really like'
b. kin 'eat' ---> kǐn'kin 'really eat'
c. nïaj 'tired' ---> nǐaj'nïaj 'really tired'
d. suǎj 'lovely' ---> súaj'sǔaj 'really lovely'

4.1.3 Negative Reduplication

This type of reduplication again copies the whole morpheme from the base but this time the reduplicative affix is a suffix with a fixed vowel, either /æ/ or /ə/. If the base is bisyllabic, the suffix has either one of the two vowels fixed on the second syllable. This pattern of reduplication serves to convey a negative attitude toward a thing or a person. In this case, both the base and the suffix receive main stress and in bisyllabic words, the main stress falls on the antepenultimate and last syllables. Examples of negative reduplication are given in (10):

(10) a. di: ---> di:dæ: OR di:də: 'good + disagreement'

di:dæ: ʔaʔráj rót k^{h}an nǐ:
good+NEG what car CLASS this
'(I don't agree) (with you) that this car is good.'

b. lâw ---> lâwlæ̂w OR lâwlə̂w 'whiskies + annoyance'

dǐ:m jū: dâj lâwlæ̂w t^{h}áŋwan
drink ASP can whiskies+NEG all-day
'(I'm really annoyed) (he) has been drinking all day.'

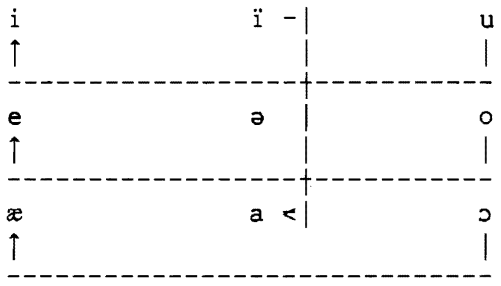
c. ro:ŋrian ---> ro:ŋrianro:ŋræ:n OR ro:ŋrianro:ŋrə:n 'school + boredom'

mâj hěn jak paj ləj ro:ŋrianro:ŋræ:n
NEG see want go ASP school+NEG
'(I'm so bored) (I) really don't want to go to school'

4.1.4 Evocative Reduplication

Like negative reduplication, evocative reduplication is a suffix copy of the phonological word base. The process is called 'evocative' because it adds a sense of expressiveness and rhythmic melody to the words. With evocative reduplication, the main stress falls on both the base and the suffix. If the base is bisyllabic, the resulting forms of reduplicative words will have the main stress fall on every syllable. The suffix has a particular vowel pattern fixed in it, as provided in (11):

(11) Vowel Patterning



Instances of evocative reduplication are shown below:[4]

(12) a. tûŋ ---> tûŋtîŋ 'sprightly'
b. sūp ---> sūpsɨp 'gossip'
c. saʔdûŋ ---> saʔdûŋsaʔdîŋ 'flinging manner'
d. jó: ---> jó:jé: 'leaning to one side or the other'
e. ʔo:n ---> ʔo:nʔe:n 'swaying'
f. tɔʔ ---> tɔʔtæʔ 'totteringly'
g. mɔm ---> mɔmmæm 'dirty'
h. pʰïm ---> pʰïmpʰam 'mumblingly'
i. jî:t ---> jî:tjât 'slowly'
j. kaʔjɨ̂k ---> kaʔjɨ̂kkaʔjâk 'unstill'

Having laid out the types of reduplication in Thai, I will now turn to the analysis of each type using the Prosodic Morphology of McCarthy and Prince.

4.2 The Analysis of Thai Reduplication

In Thai, the base or the prosodic unit which is available for reduplication is prosodically circumscribed as a phonological word. The analysis of each type of reduplication is offered below:

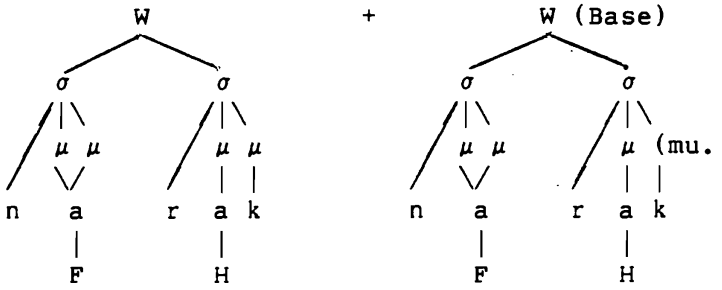
4.2.1 Simple Reduplication

The application of Prosodic Morphology to simple reduplication is very uncomplicated. Since the target of copying process is an entire phonological word, then all elements within the word, including tones, will be copied on to a new plane. Because the process is prefixal, the word temp-

late is attached to the left edge of the base which has been defined as a phonological word. This is illustrated in (13) which is a monosyllabic word and (14) which is a bisyllabic word:

(13) dēk 'child' ---> dēkdēk 'children'

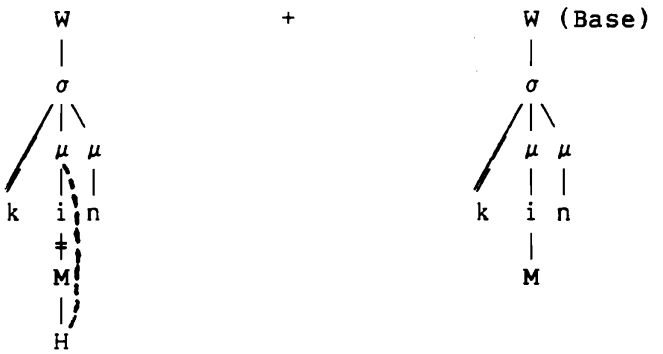
(14) nâ:rák 'cute' ---> nâ:ráknâ:rák '(sort of) cute'



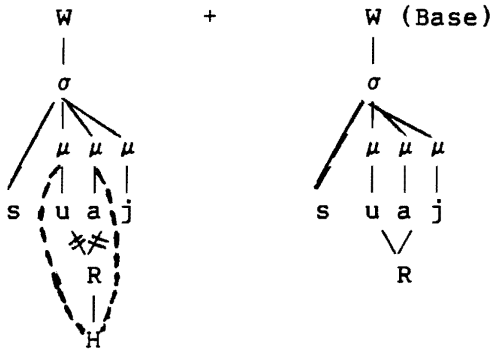
4.2.2 Emphatic Reduplication

As in simple reduplication, the target of the copying process of emphatic reduplication is a phonological word and the reduplicative template is prefixed to the base, as shown in (15) and (16). This time, however, the mid tone in *kin* in (15) and the rising tone in *suaj* in (16) are overwritten by a high tone. The high tone then associates with the vowel of the word template and the mid and rising tones are subsequently delinked.

(15) kin 'to eat' ---> kínkin 'really eat'



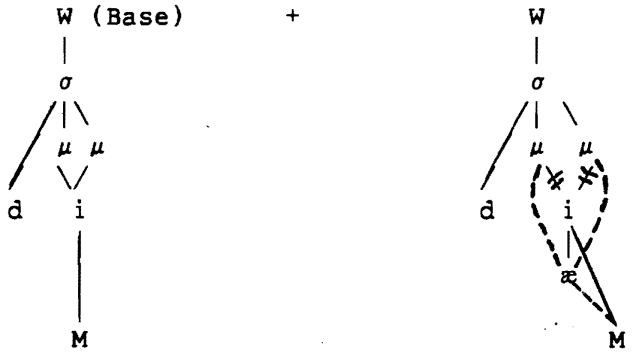
(16) sŭaj 'lovely' ---> sŭajsŭaj 'really lovely'



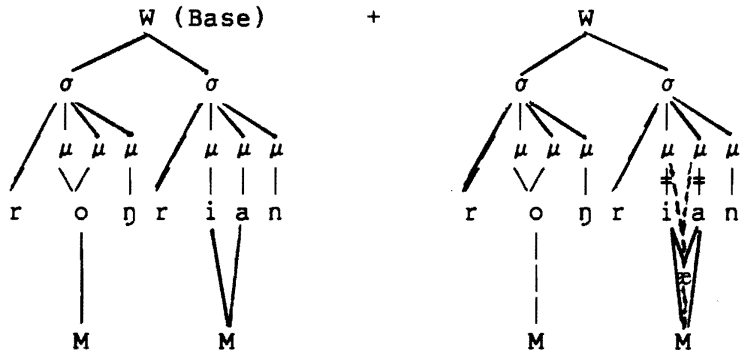
4.2.3 Negative Reduplication

The target of the copying process for negative reduplication is also a whole phonological word. Since the process is suffixal, the reduplicative template is attached to the right edge of the base, as shown in (17) and (18). Moreover, the template has either /æ/ or /ə/ fixed in it, and thus, either one of the two vowels overwrite /i/ in di: in (17) and /ia/ in *ro:ŋrian* in (18). Then the template melody /æ/ associates with the vowel on the skeletal tier and the /i/ and /ia/ are next delinked.

(17) di: 'good' ---> di:dæ: 'good + disagreement'



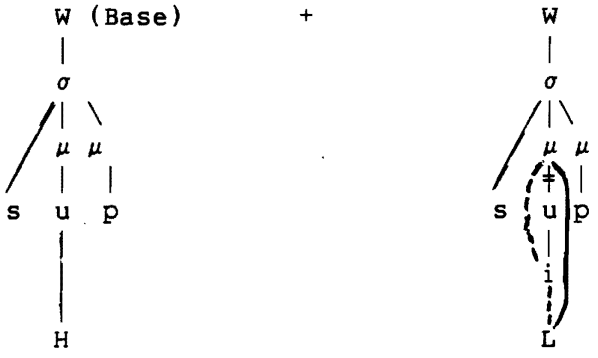
(18) ro:ŋrian 'school' ---> ro:ŋrianro:ŋræ:n 'school + boredom'



4.2.4 Evocative Reduplication

Like other types of reduplication, the target of evocative reduplication is a phonological word and the reduplicative template is prefixed to the base. As (19) illustrates, /u/ in the suffixed template is overwritten by /i/. The template melody /i/ then associates with the vowel of the syllable template and the /u/ is again delinked. This works the same way with other vowel correspondences like o-e, ï-a, and ɔ-æ where the former will be overwritten by the latter.

(19) súp ---> súpsíp 'to gossip'



5.0 CONCLUSION

In this paper, I have shown that various types of reduplication in Thai can be accounted for by employing the theory of Prosodic Morphology proposed by McCarthy and Prince (1986). Since all the kinds of reduplication that have been recognized so far result from full copying, it will be interesting to find out whether there are other types of reduplication that exhibit partial copying. If there were, then it would be challenging to explore if this framework could also account for partial reduplication. These questions will need further research.

NOTES

1 I represent stop phonemes in final position with /p t k/. Since phonemes are always pronounced unreleased finally, all stops are neutralized, and therefore, there is no way we can tell whether voiced and aspirated stops can occur as codas.

2 This structure represents the X-Theory. In the CV-theory, on the other hand, the X slots are replaced by the Cs and the Vs.

3 There are cases where nouns undergoing simple reduplication function as adjectives. These adjectival nouns then exhibit the same meaning as adjectives do, which is generality, e.g.,

man 'grease' ---> manman 'greasy'

chăn mâj c^{h}ɔp kin k^{h}ɔ̌:ŋ manman
I NEG like eat thing greasy
'I don't like to eat greasy things'

4 Haas (1942) notes that other vowel correspondences like æ-o, e-a, etc., are also found but they are very rare. Therefore, I will, at this point, treat them as exceptions which are lexically specified.

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CROSS-CULTURAL & CROSS-GENDER SPEAKING FUNDAMENTAL FREQUENCY STUDY: JAPANESE & ENGLISH

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1.0 INTRODUCTION

Mean speaking fundamental frequencies (SFF) of Japanese and Canadian subjects were obtained in both Japanese-speaking and English-speaking conditions. The collected SFF data were correlated with socio-linguistic, anatomical and language proficiency factors. The findings for females in this study coincides with the results reported by Yamazawa and Hollien (1992): the Japanese exhibited higher SFFs than did the Americans for all speaking conditions, and both Japanese and American females used higher pitch when reading in Japanese than reading in English. Yamazawa and Hollien suggested that the differences in level result primarily from differences in the structure of the two languages. In this research, in addition to the female subjects, the SFF of male subjects was examined since the author had the impression that Japanese males use rather higher pitch level when speaking English than when speaking Japanese.

2.0 CROSS-CULTURAL SFF DIFFERENCE

The speaking fundamental frequency (SFF) represents habitual pitch. It is a vocal characteristic (a single pitch or narrow range of pitches) of an individual or group who use it most of the time.

Yamazawa and Hollien (1992) found that young Japanese women (32 subjects) exhibited a significantly higher mean SFF than did their American counterparts (24 subjects). The reason for Japanese-American SFF difference is not completely understood. In their study, Yamazawa and Hollien suggest a language-dependent explanation. That is, Japanese is a syllable timed, pitch accent language, wherein the syllable is the basic prosodic unit and pitch has a phonemic function whereas English is a language of stress accent. The 'tone' aspect of Japanese could account for the addition of a group of higher frequencies to the SFF distributions for these speakers. These frequencies would, in turn, tend to raise the mean SFF level.

3.0 EXPERIMENT

3.1. Procedure

Recordings were all carried out in the sound-treated recording room at the Phonetics Laboratory of University of Victoria. All speech samples were recorded on Digital Audio Tape (Sony DT120). A microphone (Sony ECM-220T) was used for capturing the speech samples. The distance from the microphone (Sony ECM-220T) was maintained at approximately 10 cm.

Prior to recording, subjects were requested to complete a questionnaire which asked about participant's personal information such as weight and height, dialect, and duration of L2 study.

After stating their identification number, the participants were asked to read their first language passage, and then to read their second language passage. They are requested to read the passages as though to an audience of about five people, and to practice reading the passages until they became accustomed to them before recording.

3.2. Subjects

Participants in this study consisted of twelve subjects: three Japanese males (JM), three Japanese females (JF), three Canadian males (EM), and three Canadian females (EF). They were either ESL students or university students at UVic. The Japanese subjects can speak or are studying English, and Canadian students are studying Japanese as a foreign language. In order to correlate measured acoustic values with their anatomical information, and other personal concerns, a questionnaire (Chart 9) was conducted prior to recording. Although participants are from various region in Japan, and in Canada, the Japanese subjects speak Tokyo dialect (so-called standard Japanese), and the Canadian subjects speak Canadian English. All subjects do not smoke, and did not report any kind of illness affecting the throat at the time of recording.

3.3 Speech Samples

The Japanese speech material was taken from 'Donguri to Yamaneko' (children's story: 88 words) by Kenji Miyazawa. The English sample was the first paragraph of the 'Rainbow Passage' (semi-scientific material: 99 words) from Fairbanks (1960). The 'Rainbow Passage' has been commonly used in SFF investigations. For instance, Coleman and Markham (1991) invesitgated the amount of SFF variation in a series of samples (Rainbow passage) taken over an extended period of time; short- and long-term sampling. Leder & Spitzer (1993) used the Rainbow passage to examine F0, intensity, and rate of adventitiously profoundly hearing-impared adult women, and to compare the results with normal-hearing control subjects. In order to compare the present results with the findings of Yamazawa and Hollien's investigation, identical materials were used.

3.4. Analysis

After transferring the speech samples recorded on the Digital Audio tape to the computer, the digitized speech data were analyzed by the CSL program (Speech Technology Research Ltd.). Analysis pitch range was set from 50 Hz to 450 Hz. The Japanese passage was divided into six sentences (JS1-6), and the English passage was divided into nine sentences (ES1-9). Both an average SFF and the standard deviation, which is considered appropriate for measuring habitual pitch (Coleman and Markham, 1991), were obtained from the divided sentences.

4.0 RESULTS

4.1. Female Mean SFF Across Languages

Both Japanese and Canadian females used almost the same pitch level (Chart 2). All subjects except for EF3 used a higher pitch level when speaking in Japanese than when speaking in English. EF3 used an extremely high pitch in her mother tongue (English-speaking) condition. The Canadian females' standard deviation is rather high when reading the English passage compared with reading the Japanese passage.

4.2 Male Mean SFF Across Languages

Overall, Japanese males used a higher pitch level than Canadian males did (Chart 1). All subjects except for JM1 used higher pitch when speaking English than when speaking Japanese. The standard deviations between Japanese and Canadian male subjects were not significantly different.

4.3 Male/Female Mean SFF in Japanese

Although both Japanese and Canadian males kept their own habitual pitch level (chart 4) consistently across the sentences, the female pitch (chart 5) among sentences showed great variations. Mean pitch value between Japanese and Canadian females had almost no difference. The Japanese males, however, read the Japanese sentences in higher pitch than the Canadian males did (chart 3).

4.4 Male/Female Mean SFF in English

The Canadian females read the English passage with a higher pitch than the Japanese females except for the sentence seven (chart 6). As in the Japanese reading condition, the Japanese males used higher pitch constantly across sentences than the Canadian males when reading English. Pitch variation between sentences for women are greater than for men (chart 7 and 8).

5.0 DISCUSSION

The individual SFF charts, especially for the male subjects, support the existence of the individual or group habitual pitch level. Although the Japanese and Canadian females exhibited the same result that Yamazawa and Hollien (1992) reported, it was found that the male groups showed the opposite trend. That is, both Japanese and Canadian males used higher F0 when they read the English passage than when they read the Japanese passage. Alternative or additional explanations will be required in order to explain the current results. The males' results cannot be explained solely by the language-dependent explanation suggested by Yamazawa and Hollien.

The following factors can be considered as major contributors to the pitch difference between L1 and L2.

5.1 Physical size

The SFF variation could be partly explained by the anatomical size difference. It may be expected that anatomical conditions such as the geometry of the vocal tract (particularly its length), shape and mobility of the articulatory organs and of the larynx delimit certain ranges for average F0, formant bandwidths, aperiodic spectral components and other parameters (Laver and Trudgill, 1979; Laver, 1980).

Chart 9 shows the participants' average age, height and weight. The males' height and weight can be related with the SFF differences between Japanese and Canadian subjects. The Canadian males had higher SFF than the Japanese since they have larger physical size (and probably a larger/longer vocal tract). Although the Canadian females also had the larger physiological size than the Japanese, the SFF between Japanese and Canadian subjects, however, had no significant differences.

5.2 Socio- and Psycholinguistic Attributes (e.g., politeness)

The SFF variation might be linked to the prosodic aspect of politeness. It is known that Japanese language has far more complex politeness system than English (Hill et al., 1986). Japanese women use politeness forms more frequently than Japanese men (Shibatani, 1990). Loveday (1981) reports that Japanese speakers use higher pitch than English speakers when expressing politeness in each language. These higher F0 levels of Japanese speakers would have become habitual pitch for them. Thus, Japanese women especially tend to use a higher pitch level when reading Japanese than when reading English.

Also L2 learners may have a stereotype of understanding the prosodic characteristics of the target language. That is, English female speakers already have an image that the Japanese female speakers use higher pitch when speaking Japanese. Therefore, the subjects used higher pitch when reading the Japanese passage. However, the Canadian male subjects did not appear to have such an impression of Japanese males. They did not apply the higher pitch when reading the Japanese text. This is only my inference. Thus, in future research, the subjects' impression of the target language should also be surveyed after completing all recordings.

5.3 Reading style difference

The speech sample analyzed in this study were all reading materials, not naturally spoken materials. Thus, the reading style would be slightly different among languages and different sexes. The females might have used the pitch they usually use to children when reading the Japanese passage because of the nature of the text (children's story). On the other hand, males applied different reading styles and consequently different pitch level when reading the same material. The English passage is semi-scientific material, so the subjects probably used a different style.

The Japanese passage was given to the subjects in the form of Japanese characters. The different subject groups (cultures and sexes) might have used unique mental processing systems. It is reported that the mental processing of pictographic and syllable-based characters is assumed to be processed in different hemispheres of the brain (Robeck, & Wallace, 1990).

5.4 Language proficiencies

Although it was attempted to correlate SFF difference and target language proficiency level, a significant relationship could not be found. This is mainly because the language proficiency might not coincide with the duration of the subject's L2 study and of staying in the country where his or her target language is spoken.

The language-dependent explanation is one of the possible explanations to the SFF difference, but other factors which have been described above have to be considered to explain the present result more fully.

6.0 IMPLICATIONS

It is often reported that carrying over the speaker's L1 prosodic characteristics to the L2 speaking condition would impede the communication (Shibatani, 1990; Holden & Hogan, 1993). Therefore, understanding the habitual pitch commonly used by the target language population

may help in avoiding possible miscommunication, or it may help elucidate socio- and psychological attributes (eg., self-image).

7.0 FUTURE INVESTIGATION

In future research, the number of subjects would have to be increased to verify the present results. Moreover, in order to find salient reasons of the SFF variation, groups who have various physical sizes, and target-language proficiency levels should be analyzed. Also the cross-cultural and cross-gender reading style differences should be investigated in detail including sociological and psychological aspects.

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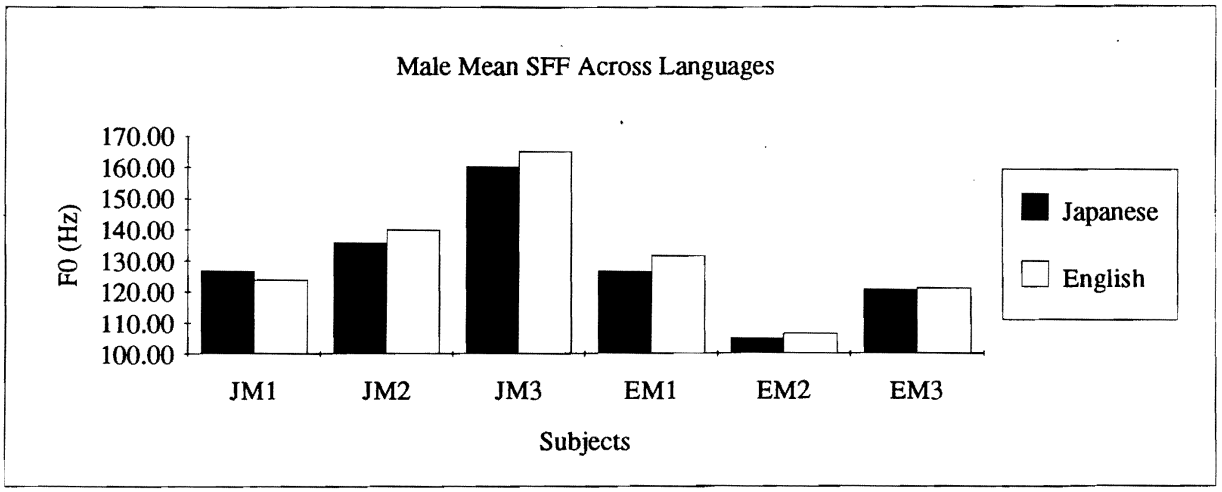

Chart 1

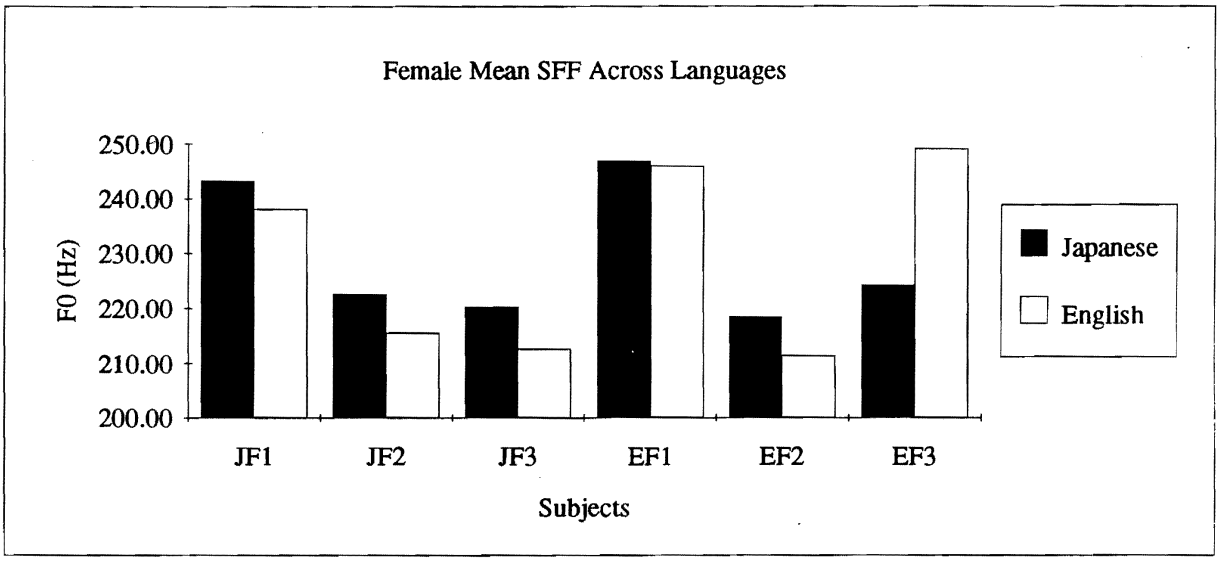

Chart 2

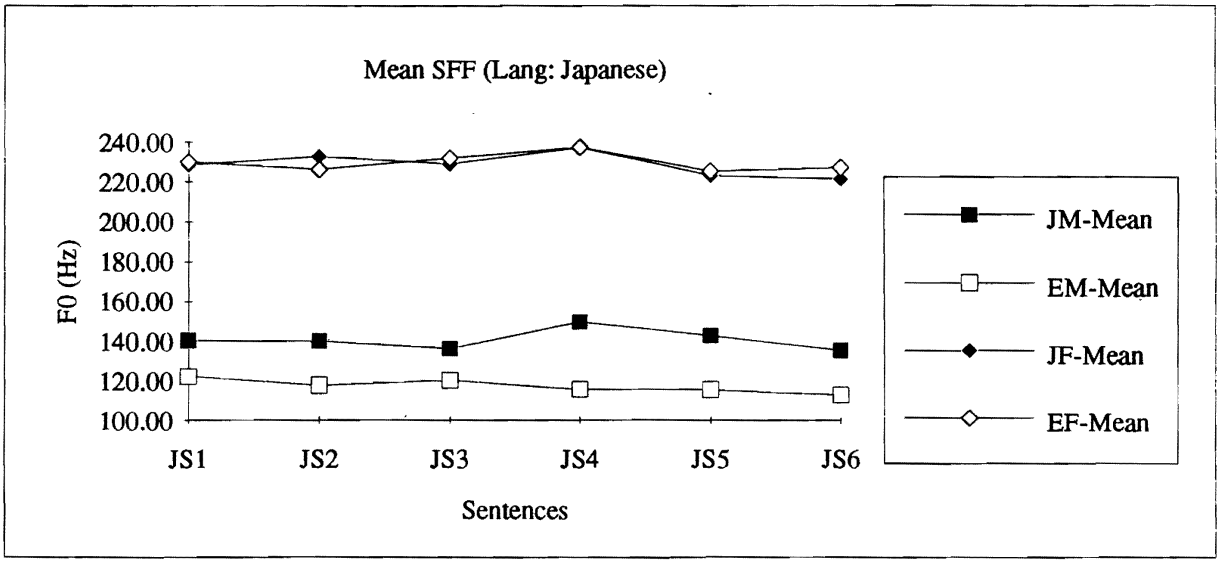

Chart 3

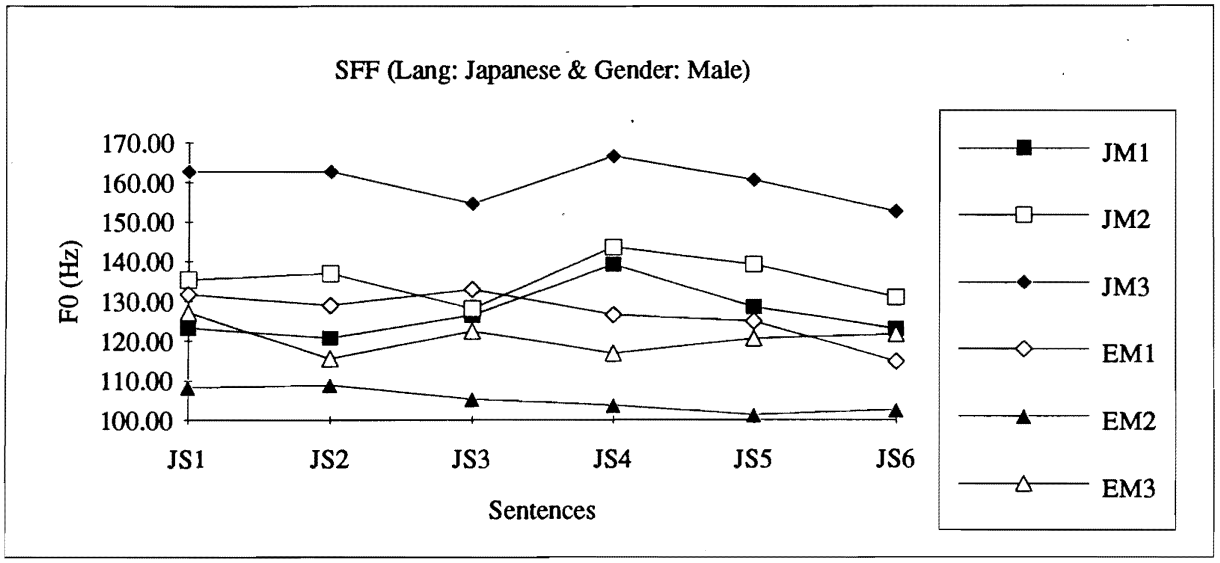

Chart 4

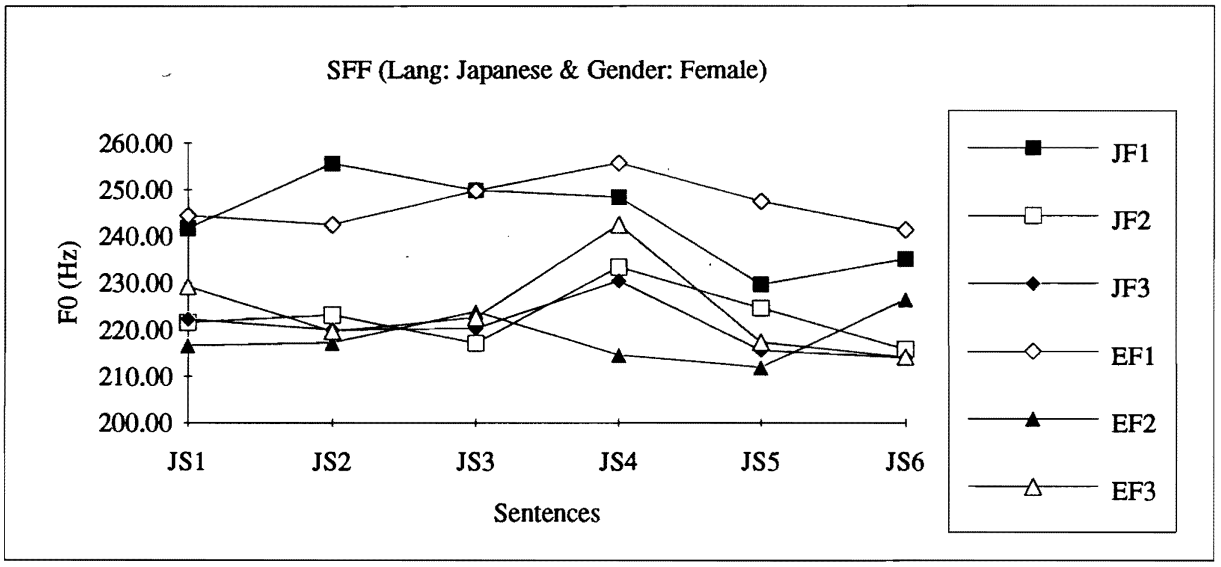

Chart 5

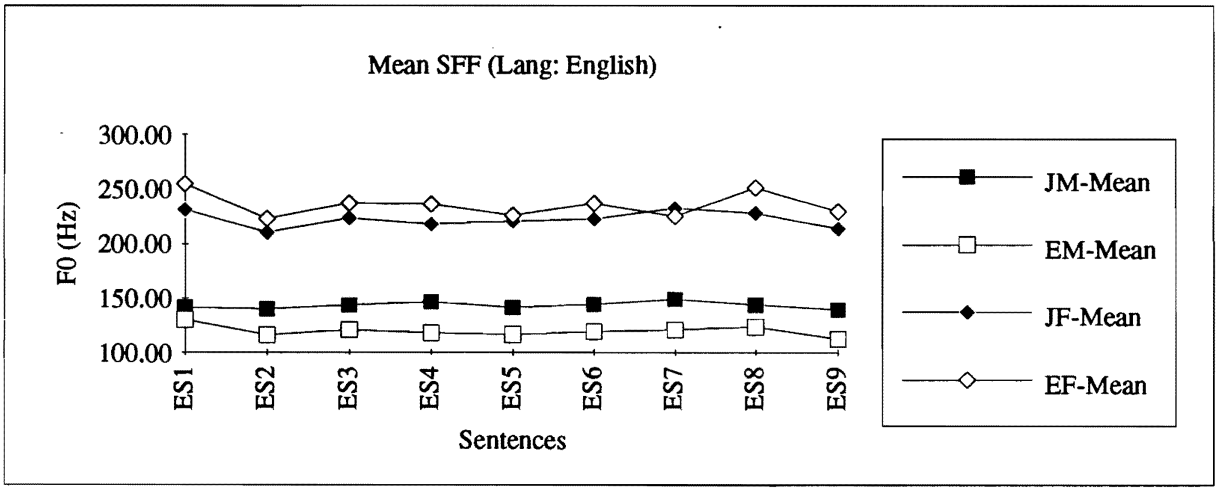

Chart 6

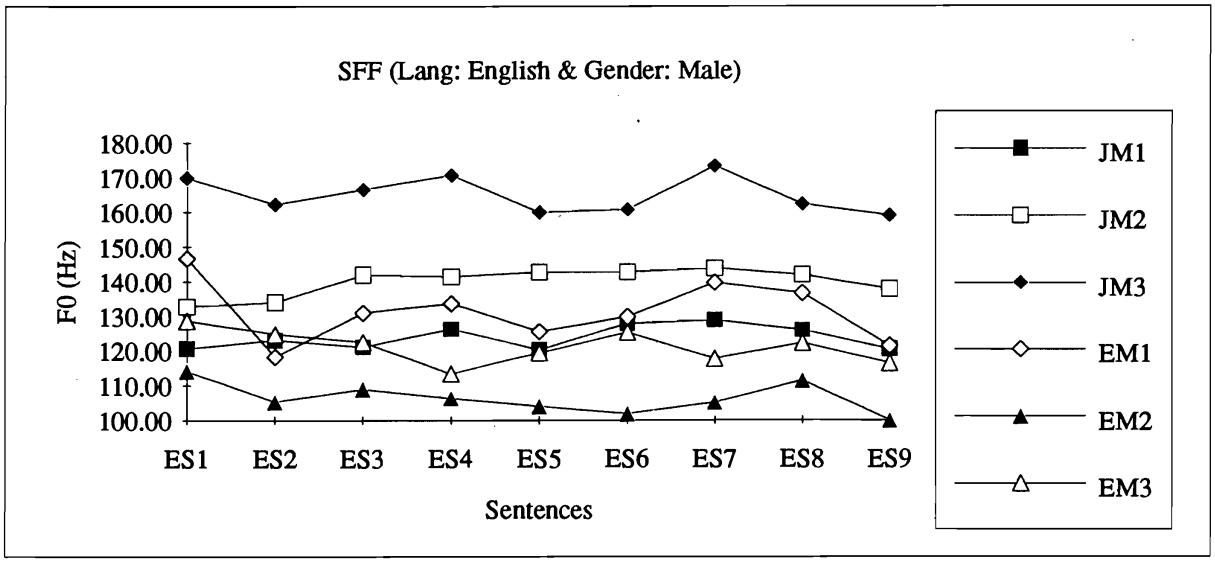

Chart 7

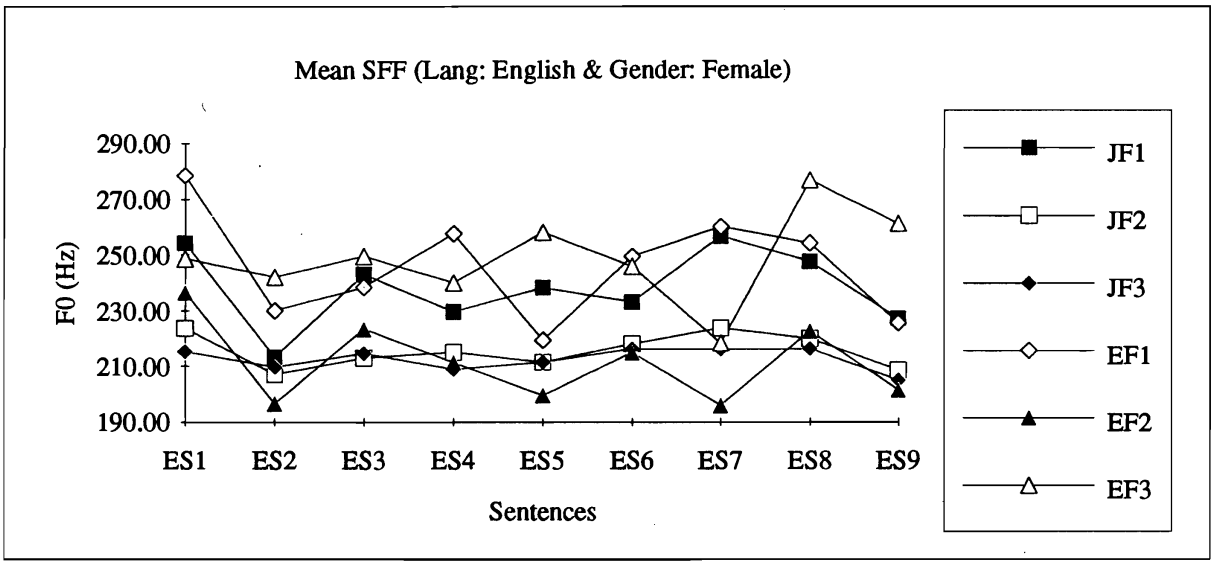

Chart 8

Summary of Questionnaire

Subjects	Age	Height (Cm)	Weight (Kg)
JM1	24	177	72
JM2	24	174	62
JM3	32	160	53
JF1	26	162	50
JF2	28	160	50
JF3	26	152	46
EM1	20	168	75
EM2	25	183	70
EM3	29	180	84
EF1	20	160	52
EF2	21	170	60
EF3	19	163	64

Chart 9

THE POWER QUEST THEME

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1.0 INTRODUCTION

In this paper I will consider the theme of the power quest in Lushootseed tales. It is apparent that many tales reflect this theme in varying degrees of abstractness, and indeed, in the three tales which I have chosen to consider the power quest is a common denominator.

I will begin with a brief discussion of the power quest and summarization of the tales. Then, the role of the antagonist and the nature of the protagonist must be considered in order to reveal the quest, and ultimately, the acquisition of power in each of the tales.

2.2. THE POWER QUEST THEME

According to Suttles (1987), the power quest occurs very often during adolescence. It is the quest for a vision involving bathing and fasting in isolation. The vision was an encounter with an animal which conferred upon the seeker a particular skill and spirit song. From that point forward, the vision became the seeker's guardian spirit.

3.0 A SUMMARY OF THE TALES

The three tales which I will be analysing are *Crow and the Son of Shell, Little Crippled One,* and *The Seal Hunting Brothers.*

3.1 Crow and the Son of Shell

Crow is of very high class, and in this tale she embarks on a journey for a suitable husband, the son of shell. On route she encounters many suitors who believe that they are the goal of her journey. In anticipation she breaks into song. Insultingly, she dismisses each and every one of them when she discovers that they are mere underlings. Eventually, she arrives at her point of destination where she weds the son of Shell and feasts with the village in honour of the occasion.

3.2 Little Crippled One

This tale describes the journey to the spirit mountain by a little crippled boy whose 'soul' is ailing.[1] Accused of being a bother to his family, he leaves his people bereaved. He reaches the people of spirit mountain where his 'soul' and his disability are healed. They instruct him to return to his people and marry the orphans of the village. He does so bringing with him great wealth. However, his people are slow to recognise this fine young man. Eventually, they do and his new wives and family prepare a great feast at which he sings his spirit song.

3.3 The Seal Hunting Brothers

This is a tale of two brothers taken, under a spell, to the land at the edge of the world. They were great hunters who provided well for their sister, as her husband failed to do so. Angry at her husband, the sister claims that her brothers are not bringing food; and consequently, her husband conspires with his family to retaliate. The grandfather puts a spell on the brothers and they embark on a hunt after a cedar seal which takes them to the land of the dwarves where they are kidnapped. A skirmish breaks out between the dwarves and the ducks leaving the dwarves dead. The brothers remove the deadly quills from the dwarves and consequently, return life to them. Grateful, they send the brothers home with many precious shells in a whale. Yet another misfortune occurs and results in their losing the shells. The brother's spirit powers come to them before they arrive home where they are greeted with a great feast at which they can sing their spirit songs.

4.0 THE PROTAGONIST

Having described the power quest theme and summarized the tales, I will now discuss the nature of the protagonist. The protagonists of these stories are Crow, the little crippled boy, and the hunting brothers, as each takes the leading part in the tale.

Each protagonist has a goal and embarks on a journey to attain such. In spite of setbacks and obstacles, they succeed in their endeavors, thus revealing a trait of their character, determination.

In the story of Crow she sets out to marry the son of Shell, and she instructs her seagull slaves to take her to him:

> dx^{w}ʔál k^{w}i bədáʔ ʔə k^{w}i x^{w}əyáliwa k^{w}i łusʔúx̌^{w}tubšləp. (34)[2]
> 'You folks take me to the son of Shell.'

Clearly, her goal is the son of Shell, and Crow must travel a distance to find him.

Crow's determination is revealed in the repeated encounters with her suitors, the first of which was Raccoon:

> ʔəx^{w}[s]cútəb cədíł k^{w}i dəx^{w}əʔúx̌^{w} ʔə tsíʔəʔ k'áʔk'aʔ. (84)
> 'She thought that this was the one that was why Crow went [there].'

But, he was not her husband-to-be, and so she continues on her way similarly encountering Drake Bufflehead, Deer, Bear, and Mallard. Although each turns out to be the wrong one, she does not get discouraged and persists in her search for the son of Shell.

The little crippled boy also sets out on a journey and bears this same determination as Crow. His feelings hurt, he leaves his family to journey to the land of the mountain people:

tul'ʔá g^{w}əl húyucutəx^{w} tíʔəʔ diʔəʔ cədiɬ bədáʔs əlg^{w}ə ʔəsq̓^{w}ǔpq̓^{w}up̓. k^{w}ədádəx^{w} tíʔəʔ d(ə)č'úʔ sʔíčəbs ʔi tíʔəʔ sq̓ašəds tul'ʔá g^{w}əl [tu]d^{z}əgíl. (31-33)
'And then their son who was crippled got ready. The child took a blanket and moccasins. And from there he crawled.'

Regardless of his handicap he embarks on an arduous journey, and this exemplifies his determination. He overcomes a physical obstacle.

In the final story the hunting brothers undertake a journey, but not of their own choice. Under a spell they are led on hunt by a cedar 'seal':

> "He [the grandfather] made the seal and instructed it to act just like a live seal and it was to run off with the hunters... to the very edge of the world far away" (Hilbert 1983:3).

Their determination is apparent in their survival and insistence on returning home despite the misfortunes which they endure. They survive the long journey without food, the kidnapping by the dwarves, the attack by the ducks, and the accident during their journey home.

Upon consideration of the protagonists in these three tales it becomes quite obvious that the common denominator between the three is that they all are seeking a goal with great determination, which can be interpreted as a quest for power.

5.0 THE ANTAGONIST

The antagonists perform an integral role in these tales, as they are responsible for providing the motivation for the quest. However, in Crow's case the motivation appears to be somewhat abstract. The encounters with Raccoon, Drake Bufflehead, Deer, etc. act as catalysts for the journey. With each failure she is spurred on closer to the village of her husband-to-be.

In the case of the little crippled boy, the antagonist is his mother who complains of her son being a bother, because he is crippled:

> dəx^{w}ʔúluɬs six^{w} tiʔəʔ dbədáʔ g^{w}əl x̌^{w}ul' cədiɬ k^{w}i səsx^{w}áq̓^{w}. (26-27)
> 'We are moving my son there again. He will just be a bother.'

Consequently, she hurts his feelings, thereby providing the motivation for the little crippled boy to venture off.

The motivation for the journey in the Seal Hunting Brothers is considerably more complex than that of the little crippled boy tale. The antagonists of the tale include: the hunter's sister, her husband, and her husband's brothers and grandfather. The sister, annoyed at her husband, lies and creates the impression that her brothers have failed in their obligation to provide food with each visit. Consequently, her husband becomes angry:

> "Now, the woman's husband gets very angry as he observes his hungry family, and he asks his wife, 'your brothers as usual have not given you any food?' His wife answers, 'no, sir, no'" (Hilbert 1983:2).

The husband wants revenge and seeks counsel with his brothers and grandfather. His grandfather states that he will put a spell on these hunting brothers to be gone with them. And indeed, under the spell they are motivated to journey and pursue their kill. In this tale, as in the others, the antagonist necessitates a quest.

6.0 ISOLATION AND FASTING

As I have described earlier, the power quest often occurs in isolation and involves fasting. While neither of these occur in Crow's quest for a husband, they do in the other tales.

In the Little Crippled Boy the protagonist is in isolation for a great deal of time during his quest:

> dəčuʔ sɬukʷálb tiʔíɬ səʔuxʷs sədᶻəqíls ʔal tiʔíɬ ləqəlqəlb dxʷʔal sɬčils dxʷʔal tiʔəʔ cədíɬ. (64)
> 'For one month he was camping out in several places until he arrived at the mountain.'

He spends this time alone in the wilderness. Even when he had arrived at the place of the mountain people, he spent a month isolated until his 'soul' was purified.

The seal hunting brothers also experienced isolation on their long journey. Not only are they alone in the wilderness, but they become isolated from their own world. As well, the fog which blankets the earth during their journey serves to intensify the sense of isolation.

> "The earth was covered with fog instantly as the seal ran off with them...'we [the hunting brothers] are far away, far away. It seems that we have been taken across the ocean'" (Hilbert 1983:4).

In addition to isolation, the brothers, as I have mention previously, are forced to fast. They did not prepare for their journey, and therefore failed to bring food along. They survive a great deal of time without food, as is mentioned after the brothers hunt for ducks:

> "They had been without food for so long!" (Hilbert 1983:7)

Considering these examples, the main characters, for the most part, experience the same isolation and fasting that is associated with quest for a spirit power.

7.0 THE SPIRIT POWER

In each of the tales the goal or spirit power is attained. Again, in Crow's case her marriage to the son of Shell must be interpreted as the attainment of the spirit power. As well, the plethora of food at the marriage feast is a sign of Crow's power:

> təl(ə)abxʷqʔíl tsíʔəʔ káʔkáʔ tíʔəʔ qa. tíʔəʔ šídᶻus, kʷi bək'ʷ stab, stʔúʔəl kʷi bək'ʷ stab. (212)
> 'Crow brought a canoe full: smelt and things, herring and things.'

In the other tales the attainment of the spirit power is far more explicit. For example, in the Little Crippled Boy, which is an account of a power quest, is welcomed into the home of the spirit power:

> tɬʔəʔ sqəlálitut dəxʷhədʔɬw ʔə tiʔəʔ sqáqagʷəɬ. (104)
> 'This is the spirit power where this noble young person entered.'

Not only does the spirit power cure his ailment, but also bestows unto him such great hunting skills that the animals would come to the young man instead of being hunted:

> gʷəl tučágʷəxʷ tiʔəʔ cədɬɬ tátačulbixʷ. tuɬčɬs ʔal tiʔɬɬ swátixʷtəd. (205-206)
> 'And the animals came down. They arrived at that place [where he was].'

The spirit power comes to the seal hunting brothers on their journey home after they had lost their treasured shells:

> "Their spirit powers came to them as they felt sad over all the misfortune they had had to endure" (Hilbert 1983:12).

But this spirit power does not bestow the same skills to them as those given to the young man in the last tale. The seal hunting brothers receive great warrior skills. This is evident from the spirit songs that they sing, they are those of **tubšadəd**, the song of the warrior.

8.0 THE SPIRIT SONG

Once the spirit power has been found and has conferred special skills upon the seeker, it became necessary to sing the spirit song that was also received. This is evident in each of the tales.

Repeatedly, Crow sings a mock spirit song while travelling:

> ləbək'ɬxʷk'ixʷ káyəyə
> ləbək'ɬxʷk'ixʷ káyəyə
> dxʷʔal kʷi bədáʔ ʔə xʷəyáliwa, xʷəyáliwa. (70)
> 'Crow is travelling to find a husband, Crow is travelling to find a husband, to the son of Shell, the son of Shell.'

After the young man returns to his people and tells them of his quest in the second tale, he sings his spirit song:

> tupɬgʷədəxʷ ʔal tiʔɬɬ dxʷʔal tushúys buusəɬdat. (218)
> 'He sang his spirit song according to the way it is done for four days.'

In the last tale, the Seal Hunting Brothers, also sing their spirit songs. The people prepare for the spirit song feast and the brothers arrive:

"They come in then from outside. Just as soon as they enter they begin to sing their spirit songs" (Hilbert 1983:13).

In each tale the main character sings his spirit song after they have succeeded in their power quest, and as is generally the case, their people benefit greatly from the song.

9.0 CONCLUSION

After a closer analysis of the three tales, it is apparent that each can be interpreted as power quest. The Little Crippled One is an obvious description of such, while the Seal Hunting Brothers is more abstract, and Crow Marries the Son of Shell is even more so.

In each tale there is a protagonist who is provided the motivation to undertake a journey by the antagonist. Determination is a key trait of these characters which assists them in their quest. Each character encounters the spirit power and has special skills conferred upon them, after which they sing their given spirit song. Consequently, the people benefit from such.

NOTES

1 In this case, 'soul' only vaguely expresses the referent in Lushootseed.

2 The number in brackets in each of the Lushootseed examples refers to the line number of the tale.

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NEGATION IN EWE

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1.0. INTRODUCTION

The aim of this paper is to introduce the data on Ewe negation, and discuss possible analyses in the light of current treatments of negation in the literature. I summarize the treatments by Chomsky (1989), Pollock (1989) and Laka (1990), and conclude that these analyses do not account for the Ewe negation data. Two types of negation are examined: sentence negation and constituent negation. It is suggested that the two types have different structures (i.e they are not derived from the same underlying structure). Constituent negation, it is suggested, is a cleft construction.

In the next section, I present some of the data on Ewe negation. In section 3, I discuss the analyses of Pollock, Chomsky and Laka. Section 4 looks at possible analyses of the Ewe data based on the previous analyses. An alternative proposal is made in Section 5. A comparison of the Ewe data with that of Akan, another language of the Kwa family, is made in this section as well.

2.0. THE DATA

The Ewe negative morpheme is a discontinuous element *me....o*, similar to the French *ne...pas*. Some examples follow.

1. a. Kofi de suku
      K. go school
      'Kofi went to school'

   b. Kofi mede suku o
      K. NEG-go school NEG
      'Kofi did not go to school'

2. a. Kofi-e Φle agbale-a
      K.-FOC buy book-the
      'It was Kofi who bought the book'

   b. Menye Kofi-e Φle agbale-a o
      NEG-be K.-FOC buy book-the NEG
      'It was not Kofi who bought the book'

The (b) example in each case is the negative counterpart of the (a) example. In (1a), the sentence is an ordinary indicative sentence. (2a) differs from (1a) in that the former has a focused subject (i.e, it is X, not Y, who performed the action denoted by the predicate). The negation in (1b) is sentence negation, while (2b) represents constituent negation. Note that constituent negation occurs

with focusing. There seems to be two processes involved; first, the constituent is focused as in (2a); then negation applies. Note also that the negative particle in both types of negative constructions precedes a verb or verbal element. In (1b), which represents sentence negation, the negative particle precedes, and is attached to the main verbal predicate *de* (go). In (2b), a constituent negation, the negative particle gets attached to a copula. The only difference between (1a) and (1b) is the negative markers *me...o*. But in (2b), apart from the negative particles, the copula verb *nye* appears (this copula is absent in (2a)). This suggests that the scope of negation in Ewe is clausal. That explains why a copula verb must appear in the constituent negation in (2b).

Now, let us consider the licensing of negative quantifiers (NQs). We notice that negation licenses both subject and object NQs. For example,

3. a. Naneke mele agba me o
Nothing NEG-be plate LOC NEG
'There is nothing in the plate'

b. *Nane-ke le agba me
nothing be plate in
'There's nothing in the plate'

c. Ama meΦle naneke o
A. NEG-buy nothing NEG
'Ama did not buy anything'

d. *Ama Φle naneke
A. buy nothing

e. Ama Φle nane
A. buy something
'Ama bought something'

f. Ame-ade-ke mele aΦea me o
person-some-NQM NEG-be house LOC neg
'There is nobody in the house'

g. Nye mekpɔ ame-ade-ke o
1sg. NEG-see person-some-NQM neg
'I did not see anybody'

h. Ame-ade le aΦea me
person-some be house in
'There is someone in the house'

i. *Ame-ade-ke le aΦea me
person-some-NQM be house in

The above examples involve NQs. It seems these NQs comprise the quantifier and a particle *ke*. Note that without this particle, the sentence does not require a negative marker, as in (3e), and

with the particle, negation is required, as shown by the ungrammaticality of (3d). There is no subject-object asymmetry with respect to NQ licensing in Ewe, as indicated in examples 3a, b, f, g. As noticed in (3b), the NQ *nane-ke* cannot occur in subject position without negation. The same applies to example (3h) involving an animate NQ. Note that examples (3f, g), also involving animate NQs are grammatical).

The suffix *ke*, which I call the negative quantifier marker (NQM), seems to occur only with nouns. Apart from the word *nane*, which it can attach to directly, all other nouns to which it attaches must first be suffixed by the quantifier *-ade*.[1] For example, compare *nane-ke* (nothing) with the following:

4a. ame-ade
person-some "someone"

b. ame-ade-ke
person-some-NQM "nobody"

5a. xevi-ade
bird-some "some bird"

b. xevi-ade-ke
bird-some-NQM "no bird"

It cannot occur with words of any other category, apart from nouns or noun phrases, not even with wh-words.

It is evident from the examples of sentences involving negative quantifiers that there is some kind of double negation: we have a negative particle in the negative quantifier and we have the normal negative markers. But semantically, these sentences do not produce a reading of *double negation*, but rather a single instance of negation. So, for example, the sentence in (3a) does not mean *There isn't nothing in the plate.* This type of phenomenon is described as *negation concord.* This is contrasted with *double negation*, in which the two or more negative elements produce an interpretation which is equal to the sum of their individual negative forces; in other words, their negative forces are compositionally realized.[2] The following example of *double negation* is taken from Degraff (1993:4).

Personne n'est pas venu
nobody NE+is PAS come
'Nobody has not come (i.e everyone came)'

In the above example, the two negative elements cancel each other, producing a net positive statement. Ewe example is clearly *negation concord* because the negative elements in sentences (3a, c) do not have a compositional effect. The negative marker and the negative element of the negative quantifier seem to enter into a kind of agreement, which, according to Zanuttini (1991, cited in Degraff), is a Spec-Head relationship.

3.0. ANALYSES OF NEGATION

Negation has been analysed variously in various languages. Pollock (1989) and Chomsky (1989) analyse negation in different ways. In this section, I explore briefly the analyses of Pollock, Chomsky and Laka(1990).

3.1. Pollock (1989)

Prior to Pollock (1989), Emmonds (1976), comparing adverb placement in French and English, suggested that French has an obligatory rule of Verb-Raising to Aux (Infl), whereas in English, this rule was restricted to auxiliary verbs (see also Jackendoff (1972)). The presence versus absence of this rule accounted for adverb placement paradigms like:

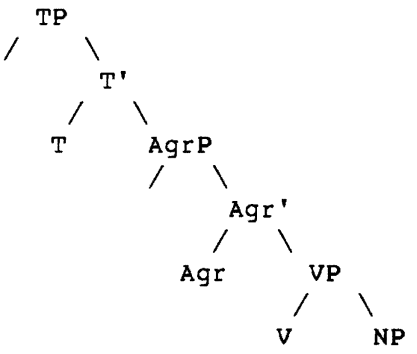
6. a. *Mary kisses often John

   b. Marie embrasse souvent Jean

   c. Mary often kisses John

Pollock (1989) provides a reformulation of Emmonds' analysis, proposing an articulated Phrase Structure, where Infl is split into two separate heads: Tense, heading its own projection TP, and Agreement heading an AgrP as shown below.

7.



According to Pollock, Verb-Raising to Infl now consists of two steps: first, movement of V to Agr and second, movement from Agr to Tense. Pollock argues that it is the first step (V-Agr) that distinguishes French from English, due to the different nature of Agr in the two languages. His claim is that there is a correlation between the strength of agreement and the ability of the verb to percolate its theta-grid through agreement once V to Agr movement has taken place. Thus French agreement is strong (transparent) enough to allow the verb to percolate its theta-grid down to its trace, after the verb has raised to Agr. English agreement, on the other hand, is opaque to such percolation. This makes it impossible for any theta- bearing verb to raise to Agr, since by doing so it would violate the Theta Criterion. Pollock proposes a NegP between AgrP and TP. To account for the **do-support** phenomenon in English, Pollock appeals to the Quantificational Theory. He suggests that Tense has a quantificational and operator-like property. Like any other operator, it must bind a variable. While this view of Tense as an operator makes Verb-Raising obligatory in French, it seriously clashes with the Theta Theory in English. To get around this problem, Pollock suggests that English allows an auxiliary verb as a substitute for the immovable main verb. This auxiliary verb is always higher up than VP, and it raises to Tense to create the variable the operator needs to satisfy Quantification Theory. In cases where there is no overt auxiliary, Pollock assumes an empty auxiliary which shares the properties of a lexical auxiliary.

3.2. Chomsky (1989)

Chomsky (1989) argues that **do-support** is forced by the ECP and the principle of Economy of Derivation (ED). This principle is a *least effort* condition in which the shortest derivation is desired, where possible, and language-specific devices are used as a last resort. So do support is used because **Move** *a* fails to salvage the given structure.

Chomsky follows Pollock in assuming the articulated phrase structure. He argues for Tense and Agr lowering onto the verb at s-structure for affirmative sentences. He assumes that after the lowering of Tense and Agr, Agr and its trace are deleted at LF, leaving the Agreement Projection empty. The trace left by Tense would satisfy the ECP by raising the inflected verb to the head Tense, creating a configuration where the trace is properly governed. In the case of negative sentences, however, Chomsky argues that lowering of Tense and Agr to the verb would violate the ECP, since the head Neg would block the government of the intermediate trace left by the verb. To salvage the derivation, Chomsky suggests that English resorts to **do** insertion in a modal position which then raises to Tense. So Tense does not have to lower to the verb; thus avoiding the ECP violation.

3.3. Laka (1990)

Laka (1990), drawing on evidence from deletion and the licensing of negative polarity items (NPIs), proposes a different structure for negation in Basque, in which NegP dominates IP. He also proposes a unified account of Chomsky and Pollock by employing the *Tense C-Command Condition*, which says that:

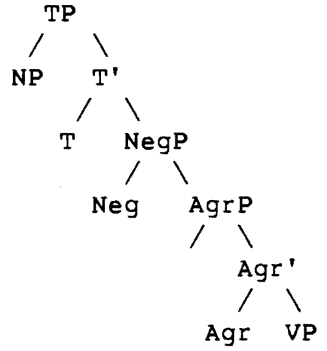
> Tense must c-command at s-structure all propositional operators of the clause.

According to Laka, it is this condition that explains the difference in negation between English and French. Lowering of Tense in sentence negation in English is impossible because the TCC would be violated. To salvage the derivation, "do" is inserted to maintain the c-command condition.

4.0. ANALYSIS OF EWE NEGATION

In the last section, I outlined the facts related to negation as proposed by Pollock (1989) for French and English, by Chomsky (1989) for English, and by Laka (1990) for Basque. In this section, I would like to consider the analysis for Ewe negation. Pollock and Chomsky both place NegP between TP and AgrP, that is Neg is "nested" in IP thus:

8.



Let us assume the articulated structure proposed by Pollock and Chomsky. Laka (1990) suggested that the difference between negative structures in Basque and English is that Neg is generated above IP in Basque, while it is "nested" in IP in English. Evidence for this position was drawn from deletion. He suggests that while it is possible to delete IP in Basque and still have NegP intact, that is not possible in English (i.e, in English, one cannot delete IP without deleting NegP with it. He predicts that in the case of conjunct-induced deletion, where one conjunct is declarative and the other negative, different results should obtain in Basque and English. The following examples are taken from Laka (1990:32-33):

9. a. * Mary bought a book and Peter not

   b. Mary bought a book and Peter didn't.

   c. Marik liburua erosi du eta Peruk ez
      M. book-the bought has and P. no
      'Mary has bought the book and Peter hasn't'

Using Laka's test as a yardstick, Ewe seems to behave in the same way as English in that we cannot delete IP. For example,

10. a. Kofi de suku gake Ama mede o
       K. go school but A. NEG-go NEG
       "Kofi went to school but Ama didn't"

    b.*Kofi de suku gake Ama o
       K. go school but A. not

The ungrammaticality of (10b) suggests that we cannot delete the IP and have NegP intact in the second conjunct. Note that this is possible in Basque (see 9c). We can conclude then that Ewe NegP, like that of English, is dominated by IP. When we look at constituent negation, we find the same phenomenon. This follows from the observation made earlier that the scope of the negative particle is clausal. Consider the example below.

11. Kofi-e de suku, menye Ama-e o
    K.-FOC go school, NEG-be A-FOC. NEG
    'It was Kofi who went to school, not Ama'

The licensing of negative quantifiers (NQs) seems to suggest that NegP dominates IP, since we find NQs in subject position in Ewe. But, as noted earlier, the NQs only serve to express the relation of negation concord, a kind of Spec-Head agreement. For example,

12. a. Nane-ke mele agba me o
       Something-NQM NEG-be plate LOC NEG
       'There is nothing in the plate'

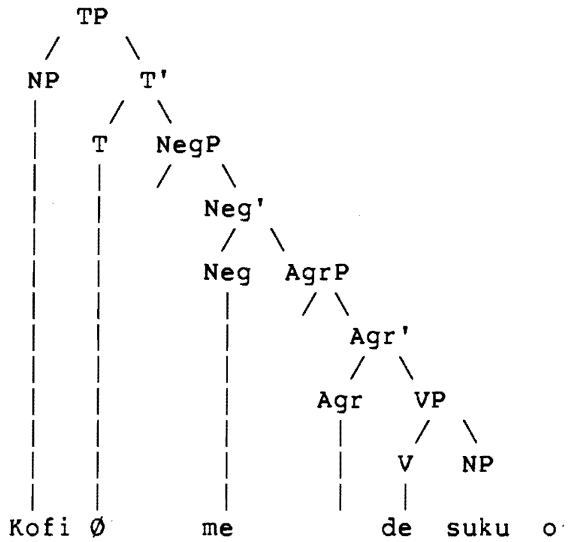
    b. *Nane mele agba me o
       something NEG-be plate LOC NEG

c. Nane le agba me
   something be plate LOC
  'There is something in the plate'

That the suffix *ke* is the negative quantifier marker is shown by the ungrammaticality of (10b) and the grammaticality of (10c). In (10b), negation occurs with the NP without the suffix (i.e, the subject is not an NQ). So the sentence is ruled out. (10c) is grammatical because there is no negation and the subject does not bear the NQ suffix. So, NQs do not have any effect on the syntactic structure of negation. NQs also function as objects of the verb, as we find in (3b).

The different behavior of sentence and constituent negations may lead to the idea that the two types of negation have different structures. Assuming the articulated structure of Pollock (1989), we have the following d-structure for Ewe sentence negation.

13.



The above structure represents the d-structure of the negative sentence in (1b) above. Assuming that every sentence has an abstract Tense, and that Tense must always be attached to V. Then either we have Tense lowering to V, or V raising to Tense. In English, the sentence:

Mary not left

is ruled out because Tense lowered to the verb, leaving its trace ungoverned, since NegP intervenes between it and the verb. In Ewe, this is exactly the order we find, where the sentence translates as:

Kofi not go to school

In Ewe, we may say there is no verb movement, since in the above example, there is no tense marker which would have to either move to the verb or have the verb move to it. But if we asume an abstract Tense, then we would have the same situation as the English example, where the trace of Tense would not be properly governed. Moreover, when we have an aspect marker

present, it may be necessary to propose movement (either lowering of Tense to V or raising of V to Tense). If we assume Neg to be affixal (which I think it is), then we can propose that V, by head-to-head movement, moves first to Neg, then [V+Neg] moves to Tense. In this way, the trace left by V would be properly governed. But this derivation would not reflect the word order string in Ewe sentence negation, which is:

NP Neg-Tense/Aspect-Verb NP

It is therefore more appropriate to propose lowering of Tense to Neg, then [Neg+T] lowering to V. For ECP to be satisfied, the inflected verb complex would be raised to Tense at LF to ensure government of the traces left at s-structure.

4.1 Constituent Negation

One difference that was noted between sentence negation and constituent negation is that in the latter, the negative particle is not attached to the main verbal predicate, but rather to a copula, as we see in example (2b), repeated below as (12).

14. Menye Kofi-e Φle agbale-a o
NEG-be K.-FOC buy book-the
'It was not Kofi who bought the book'

In (12), we see a different configuration than the one for sentence negation. Assuming that the verb in question (i.e, the verb "to be") is an auxiliary verb. The question then is: what licenses the projection of an auxiliary verb? Why can Neg not be simply attached to the negated constituent, just as it is attached to the verb in sentence negation? Using Chomsky's analysis would not save the situation in (14) because this structure does not involve lowering; if anything, it should involve raising of Tense and Neg to the NP subject. But it is difficult to account for the upstairs verb in this analysis. This situation has two possible implications: one, that constituent negation has a different structure from sentence negation; two, that NegP dominates IP, as suggested by Laka (1990) for Basque. Projecting NegP above IP would not solve the problem with constituent negation, because it cannot account for the surfacing of a second verb. The only choice left is to propose two distinct structures for the two types of phenomena we have.

5.0. AN ALTERNATIVE PROPOSAL

It is evident from the previous section that the analyses proposed by Chomsky (1989) and Pollock (1989) cannot account for the two types of negation in Ewe. Constituent negation in Ewe seems to involve a cleft construction which is definable as:

> a grammatically distinct construction whose members are characteristically derivable from more elementary clauses by dividing ("cleaving") into two parts, one of which is highlighted, while the other is subordinated in the form of a relative clause having the highlighted element as antecedent. Often (as in English), the highlighted element functions as a complement to the verb "be" (Huddleston, 1988:185).

This is exactly what seems to be happening in Ewe constituent negation. Other examples are shown below.

15. a. Menye gbesiagbe-e Kofi vana afisia o
NEG-be everyday-FOC K. come-HAB here NEG
'It is not everyday that Kofi comes here'

b. Menye klpɔ sia dzi-e agbale-a le o
NEG-be table this LOC-FOC book-the be NEG
'It is not on this table that the book is'

The above two examples involve constituent negation. (15a) shows adjunct AdvP negation, while (15b) shows a PP complement negation. The implication at this point is that the semantic distinction being drawn between sentence and constituent negation is reflected syntactically also in the distinction between non-cleft and cleft constructions. In other words, sentence negation involves a non-cleft construction, while constituent negation involves a cleft construction. This generalization would apply to sentences with NQs as well. Consider the example in (3c), repeated below.

16. Ama meΦle nane-ke o
Ama NEG-buy NQ NEG
'Ama did not buy anything'

In the above example, the NQ is in an argument position of the verb, and so is within the scope of negation, which is the clause, giving rise to sentence negation. It is possible for the NQ to be fronted like any other category in argument position. This gives rise to constituent negation. Compare the two examples below. (17b) involves an ordinary NP argument that is fronted, while (17d) involves an NQ.

17a. Ama me-Φle agbale o
Ama NEG-buy book NEG
'Ama did not buy a book'

b. Menye agbale-e Ama Φle o
NEG-be book-FOC Ama buy NEG
'It was not a book that Ama bought'

c. Ama meΦle nane-ke o
Ama NEG-buy NQ NEG
'Ama did not buy anything'

d. Menye nane-ke-e Ama Φle o
NEG-be NQ-FOC Ama buy NEG
'It was nothing that Ama bought'/'Ama bought nothing'

The structure of constituent negation suggests that NegP be projected above IP. This is supported by the example below, in which the IP in the second conjunct involving negation is deleted.

18. Menye Ama-e va o eye menye Kofi hã̃-e o
NEG-be A.-FOC come NEG and NEG-be K. also NEG.
'It is not Ama who came and it is not Kofi either'

But it can be seen from the example in (18) that the IP that is deleted is the embedded one, which is not in the scope of the negative particle. The examples of constituent negation shown in (15), exhibit cleft structures in subject position. We have NP, AdvP and PP clefts. All such structures in Ewe seem to obligatorily contain an overt verbal copula. That the copula behaves just like substantive verbs is shown in the examples in (19) and (20).

19. a. Kofi nye kuviatɔ
K. be lazy
'Kofi is lazy'

b. Kofi *(nye) nufiala
K. be teacher
'Kofi is a teacher'

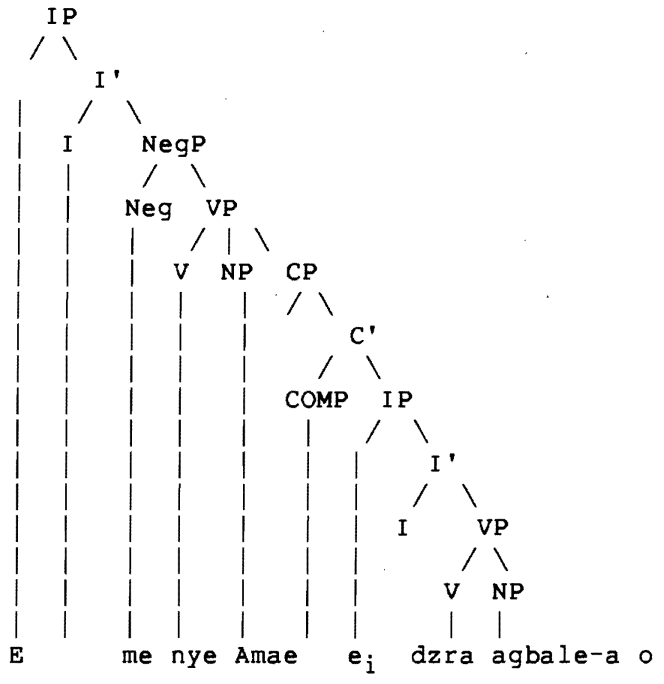
20. a. Ama a-nye miaΦe gadzipkɔla
A. ASP-be 2pl-POSS money-top-see-er
'Ama will be our treasurer'

b. Ama menye nufiala o
A. NEG-be teacher NEG
'Ama is not a teacher'

In example (19b), the only instance in which the copula verb "nye" can be omitted is in appositional reading. For that reading, there must be an intonational pause after the subject. The morpheme "nye", I assume is a verbal copula because it can take an aspect marker (20a), and it must follow Neg, just like all verbs do in Ewe (20b).

The suggestion being made here is that constituent negation in Ewe involves a cleft construction. Like most cleft constructions, I would suggest that it is bi-clausal. It involves two independent verbs. I therefore propose the following structure.

21.



The negative marker is attached to the verb in the upstairs clause, with the NP cleft focused. I suggest that there is lowering of Tense to Neg, then Tense+Neg lower to the verb. I also suggest there is a pleonastic subject in the upstairs clause, represented by "E", and this merges with Neg, Tense and the verb at PF. I also propose that there is a copula verb in both the affirmative and the negative clefts, and that this copula is absent in the affirmative clefts whenever Tense, Aspect or Neg are absent. Evidence for this position is found in the examples (22) and (23).

22. a. Kofi-e Φle agbale-a
K.-FOC buy book-the
'It was Kofi who bought the book'

b. Me-nye Kofi-e Φle agbale-a o
NEG-be K.-FOC buy book-the
'It was not Kofi who bought the book'

23. a. Kofi-e Φle agbale-a
K.-FOC buy book-the
'It was Kofi who bought the book'

b. A-nye Kofi-e Φle agbale-a
ASP-be K.-FOC buy book-the
'It may be Kofi who bought the book'

In (22a) and (23a), we find only the focused NP subject. But in (22b) and (23b), there appears the copula verb "to be" when Neg and aspect appear respectively. This suggests that there is a non-overt copula with similar features as the overt one. This copula is null in the (a) examples because

there is no overt tense or Neg. The implication is that tense (whether abstract or lexical) must always occur with the verb. We can conclude at this stage that any cleft construction in Ewe (be it negative or affirmative) has a clausal clefted constituent. The clefted segment of the structure may contain a focus marker. The constituent that is clefted is fronted (i.e., focused) and may bear a focus marker. The discussion so far suggests that the underlying form for the sentence in (23a) is that of (24):

24. Ø Ø Kofi-e Φle agbale-a
(It-be) Kofi-FOC buy book-the
'It was Kofi who bought the book'

The empty positions represent the expletive subject and the copula verb positions respectively. They are null because Ewe does not have overt tense in that context. Also, in Ewe, pronominal clitics must always be attached to the verb. The subject is also null. But in (22b), where there is an aspect marker, the copula verb has to show up for the aspect particle to get attached to, since it is affixal and cannot exist without a verb. It seems then that the copula is performing a function similar to the *do-support* phenomenon in English.

As noted earlier, a cleft construction consists of a clefted constituent and an embedded clause (usually a relative clause). In the Ewe cases, there is no overt relative pronoun in the embedded clause. I suggest that there is an empty operator which represents a non-overt wh-phrase. It is sometimes called a zero relative pronoun. This empty operator is generated at d-structure in the position of the fronted constituent. In the case of NP predicate clefts, the fronted constituent is moved vacuously from the subject position of the embedded relative clause, while the others (i.e adverbial and PP predicate clefts) are fronted from the complement positions of the verb in the embedded relative clause. The empty operator moves to [Spec, CP] at s-structure where it antecedent-governs and A-bar binds the trace of the fronted element.

One issue that comes up at this stage is the issue of the position of the focus marker that always accompanies the fronted material in the clefted construction. My speculation is that the focus marker occupies a COMP position in the embedded relative clause. The implication of this suggestion is that a situation exists in which the trace in the subject position cannot be governed by its antecedent O_i because of the intervening overt COMP. (i.e the *that*-trace effect).

25. [Menye Kofi [CP O_i -e [IP t_i Φle agbalea] o]
[NEG-be Kofi[FOC[buy book-the] NEG]

To get around the *that*-trace filter, we invoke Pesetsky's (1982:306, cited in Haegeman, 1991) proposal of a special rule which collapses the empty operator in [Spec, CP] and the adjacent COMP into one constituent which is assigned all the features of the operator.

26. O_i <u>that</u> ----> <u>that</u>$_i$

As a result of the contraction, the focus marker in COMP will now be able to antecedent-govern the trace of the fronted subject.

5.1. Negation with Negative Quantifiers

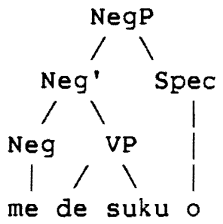
It has been proposed that negative quantifiers enter into a kind of negation concord with the negative marker. This relationship was spelled out by Zanuttini as a Spec-Head relationship. So far, the positions of the discontinuous elements of Ewe negation have been taken for granted. But they have to be addressed now. According to Lefebvre & Lumsden (1992, cited in Degraff (1993)), Fon, a language of the Gbe cluster to which Ewe belongs, has two negative markers: ă and má in head and specifier of NegP positions respectively. Fon has the negation head in post-verbal position, while the specifier is pre-verbal.

27.a. [NegP má [Neg' VP [Neg^0 ă]]]

b. (Ni) Koku má du ason ă
(if) Koku MA eat crab A
"If Koku has not eaten crab..' (Degraff, 1993:25).

In Ewe, it seems *me* is head of NegP with *o* in [Spec, Neg]. To account for the surface position of the negative particle *o*, we must assume that NegP is left-branching as follows:

28.



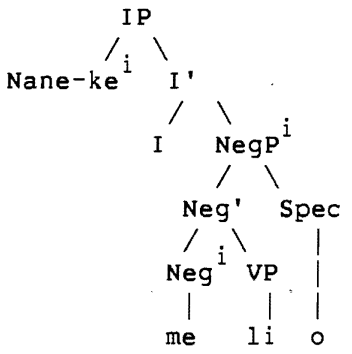
Some evidence for the proposal that *me* is head of NegP comes from double negation constructions like:

29. a. Menye Ama-e me Φle agbale-a o
NEG-be Ama-FOC NEG-buy book-the NEG
'It was not Ama that didn't buy the book'

b. not[Ama [not[buy the book]

In the above example, we have a combination of constituent negation and a sentence negation. The two *me* negatives cancel each other, producing a positive result. The sentence implies that someone didn't buy the book, but that individual is not Ama, giving Ama a positive characterization in that context. So the sentence could imply *Ama bought the book.*[3] My concern here is that if *o* were the head of NegP, we would expect to see it attached to both the negated NP and VP instead of *me*. Since the lower negative sentence is embedded in the upper one, we would expect only one specifier. Now, coming back to the issue of negative quantifiers, if the relationship between Neg and the negative quantifier is a Spec-head relationship, then we expect the negative quantifier to be in [Spec,NegP]. But we already have one of the negative markers in that position. A plausible treatment is to generate the negative quantifier in [Spec, VP] (assuming the VP-internal subject hypothesis) from where it moves to [Spec, IP] to receive case. The negative quantifier would be co-indexed (using a superscript) with the negative marker in the head position thus:

30.



5.2. Negation in Akan and Ewe

In this section, I would like to briefly compare negation in Ewe to what happens in Akan, another Kwa language spoken in Ghana. There are a few differences between Ewe and Akan, as far as sentence negation is concerned. The first of such differences is that though the negative markers in both languages are prefixed to the verb, tense or aspect morphemes cannot intervene between the negative particle and the verb in Akan; in Ewe they can. The following examples show this difference.

Ewe

31a. Kofi meΦle agbalea o
K. NEG-buy book-the NEGeg
'Kofi did not buy the book'

b. Kofi me-a-Φle agbalea o
K. NEG-ASP-buy book-the NEG
'Kofi will not buy the book'

Akan

32a. ɔ-n-di akutu
s/he-NEG-eat orange
'S/he does not eat oranges'

b. ɔ-a-n-di akutu
s/he-PERF-NEG-eat orange
'S/he hasn't eaten oranges'

The (a) examples above show simple negative sentences without tense/aspect markers. In these examples, the negative marker in each case is affixed to the verb. However, in the (b) examples where aspect appears, the Akan negative particle retains its position (immediately preceding the verb), while the Ewe one doesn't (i.e, the aspect marker intervenes between it and the verb). There are, however, instances in which the "Neg-verb" bond can be broken in Akan (see Saah, 1993). Those are cases in which there is an auxiliary verb expressing future time reference. Compare the Akan sentences in (33) to the Ewe ones in (34).

33a. ɔ-re-be-da
3sg-PROG-FUT-sleep
'S/he is about to sleep'

b. ɔ-re-n-be-da
3sg-PROG-NEG-FUT-sleep
'S/he is not about to sleep'

34a. Ama le yiyi-ge
Ama be going-FUT
'Ama will be going'

b. Ama me-le yiyi-ge o
Ama NEG-be going-FUT NEG
'Ama will not be going'

The above examples show sentences with future time references in both Akan and Ewe. The (b) examples show the negative counterparts of the (a) examples. In both cases, the "Neg-verb" bond seems to be maintained. Even though the items that are immediately preceded by the negative markers in each case are not the root verbs, they are, nevertheless, verbal elements. These elements are auxiliary verbs in each case (*be* in Akan and *le* in Ewe).

One other difference between Ewe and Akan sentence negation has to do with serial verbal constructions (SVCs). In Ewe, the two negative particles embrace whatever event is denoted by the complex VP in the SVC, with the head negative particle attached to the V1 in the series. But in Akan, the negative particle gets attached to each of the verbs in the SVC. The following are some examples (Ewe in 35, and Akan in 36).

35a. Ama Φle agbale na Kofi
A. buy book give K.
"Ama bought a book for Kofi'

b. Ama me-Φle agbale na Kofi o
Ama NEG-buy book give Kofi NEG
'Ama did not buy a book for Kofi'

36a. Kofi tɔɔ aduan ma Ama
K. buy food give A.
'Kofi bought food for Ama'

b. Kofi a-n-tɔ aduan a-m-ma Ama
K. PERF-NEG-buy food PERF-NEG-give A.
'Kofi did not buy food for Ama'

In (35b), the head negative particle gets attached to only V1, while in (36b), it is attached to both verbs. This difference may be attributed to the nature of Neg in the two languages. Ewe has a NegP made up of a specifier (o) and a head (me) and the complex VP of the SVC is embraced by the two elements. In Akan, NegP is made up of a single element (a homorganic nasal) which is affixed to both verbs. Akan negation may be said to have the status of a VP adjunct, while Ewe negation can be considered a case of a functional head.[4]

In the case of constituent negation, Ewe and Akan behave similarly. Consider the following examples.

37a. Ama-e da nua
A.-FOC cook thing-the
'It is Ama who cooked'

b. Me-nye Ama-e da nua o
NEG-be A.-FOC cook thing-the NEG
'It is not Ama who cooked'

38a. Ama na o-nua aduan no
A. FOC 3sg-cook food the
'It was Ama who cooked the food'

b. E-nye Ama na onua aduan no
3sg-NEG-be A. FOC 3sg-cook food the
'It was not Ama who cooked the food'

(37a) and (38a) are focused constructions in Ewe and Akan respectively. The focused constituent is the subject of the clause. (37b) and (38b) represent the negated forms of (37a) and (38a). Notice the appearance of a copula verb in the negated structures of both examples. Granting the earlier argument I have made about a null expletive NP in initial position of the Ewe negated structure, the two structures in (37b) and (38b) are clearly cleft constructions. The only difference is the absence of a resumptive pronominal subject for the embedded clause in the Ewe example. This difference might lead to a difference in the projection of the embedded clause in the syntactic tree. Without any elaborate discussion, I would assume that for Akan constituent negation, which is also a cleft construction, there is a non-overt element (i.e an operator) in [Spec, CP] related to the resumptive pronoun in the embedded clause. Recall that in the Ewe example, there is no resumptive pronoun (see 37b), so the empty operator is generated in [Spec, IP], which is empty. But in the Akan example, the resumptive pronoun occupies the [Spec, IP] position in the embedded relative clause, hence the generation of the operator in [Spec, CP]. This analysis for Akan constituent negation does not eliminate the problem of the *that-trace effect*, if we assume that the focus marker "na" is generated in COMP, as I have suggested for Ewe. It may seem at first that there is no movement in the case of the Akan example in (38a,b), since there is always a resumptive pronoun in place of what we assume to be the clefted (or focused) constituent. But a look at the extraction facts may change that position.

There are two views about resumptive pronouns: the base-generated view and the movement view. In the first view, the presence of a resumptive pronoun is considered as evidence against movement. The latter view considers resumptive pronouns as overt spell-outs of traces (see Rochemont & Saxon, 1993; Koopman & Sportiche, 1986). One test that shows whether sentences involving resumptive pronouns are the result of movement or not is to find out whether such structures permit island violations. If the presence of a resumptive pronoun is evidence against movement, we would expect that structures involving resumptive pronouns would permit island violations. In cases where island violations are not permitted, we can conclude that they involve movement. I briefly consider this issue in the following paragraphs.

Both Ewe and Akan are subject to the island constraints. This means that in both languages we cannot extract from a complex NP. For example,

Ewe

39a. Ama bu agbale si Kofi Φle la
A. lose book REL K. buy the
'Ama lost the book which Kofi bought'

b. Ameka-e Ama bu agbale si *t/wɔ̃ Φle?
person-which A. lose book which *t/3sg buy
'Who did Ama lose the book which t/he bought?'

Akan

40a. Ama yraa homma a Kofi tɔe
A. lose book REL K. buy
'Ama lost the book that Kofi bought'

b.*Hena na Ama yra homma a t/ɔ -tɔe
'Who did Ama lose the book which t/3sg bought?

Examples (39) and (40) are from Ewe and Akan respectively. We can see from examples (39b) and (40b) that Wh-extraction from a a complex NP is not possible in either Ewe or Akan. The same restriction applies to fronting or focusing from a complex NP. The examples in (41) and (42) show the island effects in Ewe and Akan as far as clefting is concerned.

41a. Ama bu agbale si Kofi Φle la
A. lose book REL K. buy the
'Ama lost the book which Kofi bought'

b.*Kofi-e Ama bu agbale si t/wɔ̀ Φle la
K.-FOC A. lose book which t/3sg buy
'It was Kofi that Ama lost the book which t/he bought'

42a. Ama yraa homma a Kofi tɔɔe
Ama lose book REL Kofi buy-past
'Ama lost the book which Kofi bought'

b.*Kofi na Ama yra homma a t/ɔ-tɔe
K. FOC A. lose book REL t/3sg-buy
'It was Kofi that Ama lost the book which s/he bought'

From the examples above, we see clearly that fronted questions or clefted structures do not permit island violations in both Ewe and Akan. We can, therefore, assume that these structures involve movement. We would then treat the Akan case as movement in which the resumptive pronouns are overt spell-out of the traces. We may now distinguish between Ewe and Akan extraction facts by means of "overtness" or "non-overtness" of traces. While fronting or focusing in both languages involve movement, Akan requires overt traces, while Ewe does not. But this does not tell the entire story because Ewe allows resumptive pronouns in fronted questions (i.e in wh-extraction). It is only in clefting that the two languages differ.

Having concluded that clefting with resumptive pronouns in Akan involves movement, the structures for the subject and object clefts will look like those in (43a, b) respectively.

43a. [IP E-n-ye Ama [CP O_i na [IP o_i-nua aduan no_i]
[It-neg-be Ama [FOC [she-cook food the]

b. [IP E-n-ye Ama [CP O_i na [IP Kofi bɔɔ no_i]
[It-neg-be A [FOC [Kofi beat 3sg.]

6.0 CONCLUSION

In this paper, I have tried to examine the data on Ewe negation. Two types of negative constructions have been presented: sentence negation and constituent negation. One fact that has clearly emerged from the discussion is that the scope of Ewe negation is clausal. That is why the copula verb has to show up in constituent negation. It has been shown that the proposals of Pollock (1989), Chomsky (1989) and Laka (1990) cannot account for the facts of Ewe negation. It was also suggested that the two types of negative constructions have different underlying structures; sentence negation has the normal IP structure, while constituent negation involves a cleft construction. The derivation process in both cases is similar: Tense lowers to Neg and both lower V to reflect the surface order of items in the construction. It has also been suggested that of the discontinuous elements making up the negative marker in Ewe, *me* is the head and *o* is the specifier. Some speculation has been made about the similarity in underlying structures of a sentence involving a focused element and the clefted clause of constituent negation. Negation structures of Ewe and Akan were compared and some similarities and differences noted. Most of the suggestion made in this paper are subject to further investigation and comparison with other languages, especially within the Kwa group.

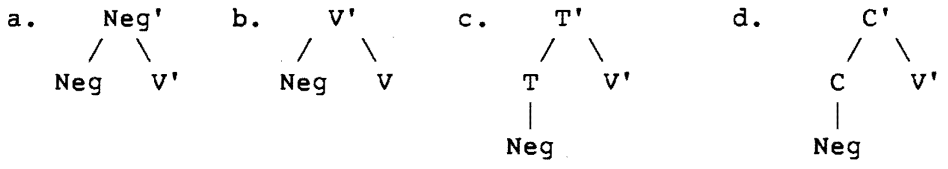
NOTES

1 My intuition tells me that the word *nane* is also made up of a nominal root *nu* "thing" and a quantifier *ade* to form *nu-ade*. It seems the present form *nane* is the result of language change, involving some phonological processes. The speculation that there has been some historical change is supported by the fact that some related dialects of the *Gbe* group of languages, to which Ewe belongs, still use the form *nu-de* for the Ewe form *nane*.

2 For a more comprehensive description of *double negation* and *negation concord*, see Degraff (1993).

3 Saah (personal communication) points out that in Akan, a sentence of the same structure could mean that it is not the case that Ama voluntarily refused to buy the book, but that she was caught in a situation beyond her control (e.g because she did not have money). So we cannot blame her for her inability to buy the book. This reading at any rate, implies that Ama did not buy the book, a reading quite different from the Ewe reading. It is possible Ewe could have that kind of reading, but I am not in a position to defend that now.

4 Déchaine (1993) discusses possible projections of negation in various languages. She considers negation as a closed-class item that occupies the borderline between lexical and functional heads, and calls it *quasi-functional head*, defined as "a closed-class item which may be, but is not necessarily, the head of an f-projection". Déchaine identifies four possible projections of negation: (a) as a functional head; (b) as a VP-adjunct; the other two possibilities are to generate Neg in Tense and Comp resepectively. These are projected as follows:



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SUBJECT RAISING FROM TENSED CLAUSES: EVIDENCE FROM BELLA COOLA COMPLEX ʔay CONSTRUCTIONS

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1.0 INTRODUCTION

Early analyses of subject-to-subject raising focus primarily on evidence gathered from languages which do not permit raising from tensed complement clauses, the Joseph and Perlmutter (1979) and Soames and Perlmutter (1979) treatments of Modern Greek serving as notable exceptions. In fact, in an analysis of the Null Subject parameter, Rizzi (1982) claims that "the subject of a tensed clause cannot be extracted via raising" in any language (p. 144). Subsequently, Grosu and Horvath (1984), Rivero (1987a, 1987b), Moore (1988) and Déprez (1992) have documented the facts of raising from tensed complement clauses in Romanian, Modern Greek, Turkish and Haitian Creole. Bella Coola provides additional evidence that such raising is a fact of natural language.

This paper describes the behavior of those complex sentences of Bella Coola which incorporate the Bella Coola root ʔay *do, happen* as a matrix predicate. These constructions often exhibit a dependent relation between the non-thematic subject position of the matrix clause and the thematic subject position of a subordinate finite-clause. In accounting for this fact, the main predicate ʔay, lacking a thematic external argument, is identified in this paper as a raising verb. As such, it triggers certain processes: the raising of the subject of the embedded clause to matrix subject position or the insertion of a dummy to serve as matrix subject.

Section 2.0 provides a brief sketch of the morphosyntax of Bella Coola. Section 3.0 presents the facts of complex ʔay constructions. Section 4.0 identifies the properties which characterize raising ʔay. Section 5.0 highlights certain theoretical considerations.

2.0 AN OVERVIEW OF THE RELEVANT BELLA COOLA MORPHOSYNTAX

Bella Coola, a Salishan Language spoken on the central coast of British Columbia, can be characterized as a polysynthetic language.[1] Bella Coola words are built on root morphemes, the exact functions and meanings of which may vary depending upon their position in a sentence and upon the presence or absence of certain affixes. Like other Salishan languages, Bella Coola does not exhibit an inherent distinction among verbs, nouns, and adjectives. Consider the following three Bella Coola sentences[2] in which the root morpheme **ja** *good* functions in the first as a modifier, in the second as a predicate, and in the third as a substantive:

k'xic tija tiʔimlktx `I see the good man.'
ja cixnascx ʔułtʔimlktx `The woman is good to the man.'
ʔałk'jukił tijatx `We know the good one.'

In each case the root **ja** exhibits the morphology and position appropriate to its function. The meaning of a particular root may be altered by suffixation of certain lexical morphemes; compare the change in meaning of the bare root ʔay *do, happen'* to the root-plus-lexical-affix stems ʔay=uc *say, tell, instruct* and ʔay=aɬ *walk, go by foot.*

Bella Coola does not formally indicate tense, context serving as a primary indicator of time reference. However, the language also lacks an infinitival form; consequently, all clauses have been interpreted as tensed by convention. Furthermore, matrix and subordinate verbs exhibit the same variety of pronominal inflection. Bella Coola utilizes eight distinct paradigms of person markers. In four of the paradigms, a clear morpheme break between subject and object suffixes is often difficult to ascertain.[3] Possessive and intransitive subject markings are taken from the same paradigm.

Bella Coola is a language whose direct arguments may remain lexically unspecified. For example, in sentence (1a) below,[4] agreement features which correspond in person and number to the features of the unspecified external-argument appear suffixed to the intransitive verb stem; in sentence (1b) agreement features which correspond to the features of both the unspecified external- and internal-arguments appear suffixed to the transitive verb stem.[5]

(1a)
nu-tk'ak'-m-ā̓x̣-aw
human-fall Redp-MP-bottom-they
They fell over backwards.(1-110)

(1b)
ʔip'-is
grab-he/it
He grabbed it. (1-112)

Based on such facts, Bella Coola can be categorized as a pro-drop language; more specifically, Bella Coola permits phonologically null subjects and objects in tensed clauses. I assume that *pro* occupies such null argument positions.

Bella Coola also makes use of null expletives, as the following sentences confirm. These sentences contain verbs which express *nature* phenomena. In each case the verb bears the intransitive 3-singular subject agreement marking **-s**, despite the fact that there is no actual referent for that subject marking. This suggests that these verbs lack a thematic external argument and require the insertion of a null element to serve as dummy subject of the verb. As a consequence of this dummy insertion, the intransitive 3-singular agreement marking appears affixed to the verb stem.

(2a) ʔix-pq'^{w}-m-s
Distb-blizzard-MP-it
There was a blizzard.(5-20)

(2b) x̣im-s
dawn-it
It broke day.(10-124)

(2c) c'us-m-s-c'
dark-MP-it-Perf
It was dark.(16-102)

The person and number features of the direct arguments are usually morphologically encoded on the verb; however, on occasion main predicates may, in fact, lack the intransitive 3-singular subject marking **-s**. Davis and Saunders (1978) note that the occurrence of this affix "at one time appeared to be stylistically determined" for nonembedded predicates. They further explain that the Bella Coola speakers with whom they worked frequently did not employ the **-s** suffix on matrix predicates. These consultants commented that the use of **-s** was typical of old-style storytelling. This suggests that, whenever a matrix predicate is found lacking a subject marker, that subject marker can be assumed to be intransitive 3-singular.[6]

Constructions which comprise null subjects and null objects appear to be stylistically preferred; however, it is also possible for direct arguments to be expressed as lexical noun phrases, in which case the noun phrases cooccur with the agreement features encoded on the verb. In the presence of such noun phrases, the dominant word order follows a Verb-Subject-Object pattern in both matrix and subordinate clauses.

Subordination in Bella Coola takes a number of forms. For the purposes of this discussion we need only consider one type: a nominalized verb clause positioned to the right of the matrix verb clause. The nominalized verb exhibits the same variety of inflectional and derivational affixes that marks non-nominalized verbs; what is characteristic of the nominalized verb is the fact that it bears the derivational prefix **s-**, the same prefix which is found on many Bella Coola nouns. For ease of exposition, I will use V to refer to a verb which functions as a matrix predicate and which does not bear the **s-** nominalizing prefix and NV to refer to a nominalized verb which functions as an embedded predicate and bears the **s-** nominalizing prefix.

3.0 A SURVEY OF COMPLEX ʔay CONSTRUCTIONS

The data which follow represent a sample of the 133 sentences found in Davis and Saunders *Bella Coola Texts* which comprise an ʔay V followed by an NV. Noun phrases and/or prepositional phrases may intervene between a V and its corresponding NV. As Bella Coola lacks infinitival forms, all of the NVs under consideration have been given a finite interpretation. Three categories of V NV subject-marking patterns are evident from these sentences.

Most numerous are those cases in which V NV pairs bear subject markings which correspond in both person and number, suggesting a relation either of raising or of control between the two subjects. I argue on semantic grounds that it is raising. This view is supported by the fact that in another pattern the V of the V NV pair exhibits intransitive 3-singular subject marking while the NV shows a range of possible subject markings. I argue that the subject of the ʔay V in this case is an expletive, the subject which occurs in the absence of raising to fill the semantically empty subject position. The complementarity of overt subject NPs in matrix and embedded clauses also provides significant support for a raising analysis. I will argue that a third set of examples involves a distinct, but homophonous, lexical item ʔay whose semantic properties are quite different from those of raising ʔay.

3.1 Data which support an analysis of ʔay as a raising verb

The sentences examined in this section support an analysis of ʔay as a raising verb. In each case the ʔay V and its corresponding NV bear subject markings which agree in both person and number. The translations provided by Davis and Saunders indicate that the subject markings which appear on a V NV pair must have the same referent. These translations also suggest that the main predicate ʔay makes no appreciable semantic contribution to the sentence.

Consider sentences (3)-(7). The V NV pairs in (3) and (4) exhibit corresponding intansitive 3-plural subject markings. The Vs of (5) and (6) are marked for intransitive 3-plural, while their respective NVs are marked for transitive 3-plural/3-plural. In example (7) both the V and the NV bear intransitive 2-singular. In each of these sentences the semantic contribution of ʔay is negligible at best; in fact, the Vs in (4) and (5) contribute nothing to the English translations.

(3) ʔaɬ-ʔay-na-k^{w}-i-lu-c'i-k
Res-do-they-Quot-Contr-Expv-Perf
V

x-tx̣^{w} s-nic-m-aw
Prep-then Der-live-MP-they
NV

It's just as if they came alive.(2-94)

(4) ʔay-naw x-tx̣^{w} s-nax-liwa-nimut-aw-tu-c'
do-they Prep-then Der-ready-Sim-LCRefl-they-Conf-Perf
V NV

Then they made ready.(2-53)

(5) ʔay-naw x-tx̣^{w} s-ʔaɬ-ik^{w}-tit
do-they Prep-then Der-Res-roast on open fire-they/them
V NV

s-knix-tit
Der-eat-they/them

They roasted/barbecued them and ate them.(5-39)

(6) ʔay-na-k^{w}-c' x-tx̣^{w}
do-they-Quot-Perf Prep-then
V
s-panya-t-it-c' aɬ-tx̣^{w}
Der-smoke meat-Tr-they/they-Perf Prep-then
NV

s-aɬ-kɬ-ayx-ɬ-aw aɬ-tx̣^{w}
Der-Res-drop-LCRes-Mid-they Prep-then

What they did then was to smoke them when they were brought down.(7-22)

(7) ʔax̣-ku-ya-nu ka-ay-nu x-ʔnc
Neg-Surp-good-you Unr-do-you Prep-me
V

s-ka-anu-s-ʔay-anm-nu al-a-āx^{w}a
Der-Unr-Cont-Der-do-LCDev-you Prep-Prox-surrounding area
NV

cut-m-im-k^{w}-c' iɬ-cāctī-ɬ
say-Tr-Pass-Quot-Perf NProx-young person-Dist

x-ʔiɬ-ƛ'msta-yɬ
Prep-NProx-person-Dist

"You won't be any good if you do like me staying here forever," the girl was told by the woman.(9-22)

The same facts are evident in complex ʔay constructions whose V NV pairs are marked for 3-singular subjects. In each of the sentences (8)-(11), both the V and the NV bear 3-singular subject markings. Observe that while the Vs are marked for intransitive 3-singular subject, the NVs may bear morphology from the intransitive or transitive paradigms. In (8)-(10) the NVs are marked for intransitive 3-singular subject, while in (11) the NV is marked for transitive 3-singular/3-singular.

(8) ʔay-s-k^{w}-c' aɬ-tx̣^{w}
happen-it-Quot-Perf Prep-then
V

s-ʔaciw-lt-s ʔaɬ-tx̣^{w}
Der-abdominal cavity-child-she Prep-then
NV

It happened then that she was pregnant.(9-114)

(9) ʔay-s ʔaɬ-tx̣^{w} way
do-she Prep-then OK
V

s-ʔiɬʔiɬq'nɬa-m-aɬɬ-s ʔaɬ-tx̣^{w}
Der-angry Redp-MP-throat-she Prep-then
NV

She was swearing angrily then.(10-8)

(10) ʔay-s-c' x-tx̣^{w} way s-lip'-cut-s-c'
do-she-Perf Prep-then OK Der-return-Refl-she-Perf
V NV

aɬ-tx̣$_{w}$ ʔuɬ-tu-amat-alāx̣t-s-tx̣$_{w}$
Prep-then Prep-NProx-stay-connection-her-Dist

What she did then was to return to her parents.(10-68)

(11) ʔay-s-k^{w}-c' aɬ-tx̣^{w} s-ʔax^{w}snix-ak-is
do-it-Quot-Perf Prep-then Der-hear-hand-she/him
V NV

ta-tixtīx̣-m-t-x̣ ʔaɬ-tu-āx̣ɬ-tx̣^{w}
NProx-pound-Redp-MP-Dist Prep-NProx-upriver-Dist

It happened then that she heard someone pounding poles upriver.(9-8)

Now consider the translations rendered for these sentences. In each case the referent of the V's subject marker is interpretable as identical to that of the NV's subject marker or as nonreferential; beyond this, the ʔay V seems to be contributing little semantically. In fact, the translation for (9) suggests that the ʔay V completely lacks semantic content.

The complex ʔay constructions examined in this section share three things: the V NV pairs bear subject markings which agree in both person and number; a V has the same subject referent as its NV or no referent at all; and an ʔay V makes little, if any, appreciable semantic contribution to a sentence. The first two characteristics suggest that ʔay may be either a raising verb or a control verb; however, it is the third characteristic which tips the scales in favor of raising.

3.2 Data which demonstrate ʔay optionally functions as a raising verb

To this point, we have only examined sentences whose V NV pairs bear subject markings which agree in both person and number and whose direct arguments are lexically unspecified. In this section, we consider those sentences in which the V and the corresponding NV may or may not bear subject markings which agree. As the presence of lexical noun phrases may help to uncover the nature of the relation between the V and the NV in these complex ʔay constructions, the sentences under consideration each contain a lexically-specified subject NP exclusively in the V

clause or exclusively in the NV clause. Such complementarity -- [[V NP [NV]]] versus [[V [NV NP]]] -- is significant insofar as it demonstrates that ʔay optionally functions as a raising verb, the alternative being that ʔay triggers null expletive insertion.

Let us first consider sentences in which the V NV pairs are marked for 3-singular subjects. In sentences (12)-(15) the Vs invariably bear marking from the intransitive paradigm regardless of the transitivity of the NVs. Observe that whereas the V clauses of sentences (12) and (13) lack explicit subjects, the V clauses of (14)-(15) have overt subject NPs. Conversely, the NV clauses of (14)-(15) lack explicit subjects, while those of (12)-(13) have them.

(12) ʔay-s-k^{w}-c' ʔaɬ-tx̣^{w} s-kɬ-im
do-he-Quot-Perf Prep-then Der-drop-Pass
V NV

ta-ƛ'msta-tx̣^{w}
NProx-person-Dist
NP

The man was dropped down there.(7-5)

(13) ʔay-s-k^{w} aɬ-tx̣^{w} s-ʔulx̣-anm-s-k^{w}-ma
do-he-Quot Prep-then Der-act irrationally-LCDev-he-Quot-Dub
V NV

ta-ƛ'msta-tx̣
NProx-person-Dist
NP

It must have happened then that he passed out.(18-11)

(14) ʔay-k^{w}-tu-ya t'ax̣
do-Quot-Conf-Incomp that one
V NP

s-ka-ip'-uɬ-ūs-im
Der-Unr-grab-direction-flat surface-Pass
NV

ʔaɬ-tx̣^{w}
Prep-then

It so happened then that the edge of it was grabbed.(10-173)

(15) ʔay-s x-tx̣^{w} ti-ƛ'msta s-wauslx-s
do-he Prep-then Prox-person Der-anxious-he
V NP NV

s-x̣ɬaɬ-s
Der-hungry-he

The people were anxious and hungry.(5-40)

Like the sentences examined earlier, these sentences also illustrate that ʔay is contributing little, if anything, semantically. The ʔay V seems equally interpretable as some version of the English expression *it happened* or receives no interpretation. This suggests that in a complex ʔay construction, a NP which specifies the subject of the NV can take up a position as subject of the V or as subject of the NV without altering the contribution of the ʔay clause --- and, therefore, the meanings of the sentences --- in any significant way. This is the mark of a raising structure.

Sentences with 3-plural subjects marked on the NV indicate the same pattern: that is to say, intransitive marking appears on the V; the subject noun phrases may be positioned within the matrix V clause or the embedded NV clause without altering the contribution of the ʔay clause; and, the ʔay V seems to be contributing little semantically. Consider sentences (16)-(19). In (16) and (17), the embedded clause of each comprises a NV and a NP which specifies the subject of that NV. The Vs bear intransitive 3-singular marking, while their corresponding NVs are marked for 3-plural subjects.

(16) ʔay-s ʔaɬ-tx̣^{w} s-q^{w}lx^{w}-cut-a-k^{w}-c'
happen-it Prep-then Der-gather-Refl-they-Quot-Perf
V NV

tu-xnas-uks-tx̣^{w} ....
NProx-woman-Pl-Dist
NP

It happened then that the women gathered....(17-13)

(17) ʔay-s-k^{w}-c' aɬ-tx̣^{w}
happen-it-Quot-Perf Prep-then
V

s-tix-ʔaɬ-ay-ak-m-it t'ax̣^{w} t'ax̣ ....
Der-bring back-Res-do-hand-MP-they/him those ones that one
NV NP NP

It happened then that they managed to get him back....(17-46)

In sentences (18) and (19), the matrix clauses contain overt NPs which serve to specify the subjects of the Vs; conversely, the NVs lack overt subject NPs. Predictably, the Vs agree in person and number with their subject NPs and are marked with intransitive 3-plural. Just as importantly, however, we find that the NVs are also marked for 3-plural subject.

(18) ʔay-na-k^{w}-c' t'aẋ^{w} s-ʔałps-aw
do-they-Quot-Perf those ones Der-eat-they
V NP NV

Then they ate. (3-56)

(19) ʔał-ʔay-na-k^{w}-i-lu-k t'aẋ^{w}
Res-do-they-Quot-Contr-Expv those ones
V NP

s-ʔał-ʔawł-tim ʔał-tẋ^{w} x-ta-wina-tẋ^{w}
Der-Res-follow-Pass Prep-then Prep-NProx-invade-Dist
NV

And they were followed by the invaders.(15-22)

The sentences with 3-plural NVs highlight one notable fact which is not obvious when the subject of the NV is 3-singular. Whereas the V NV pairs are invariably marked for 3-singular in sentences (12)-(15), this is not the case for (16)-(19). In the event that the 3-plural NP is positioned within the NV clause, the V bears intransitive 3-singular marking. On the other hand, if the the 3-plural NP is positioned within the matrix V clause, both the V and the NV show 3-plural subject agreement. This, coupled with the fact that ʔay contributes little to the meaning of the sentence, flags ʔay as an optional raising verb. Lacking a thematic external argument, ʔay triggers the raising of the subject of the embedded clause to matrix subject position or the insertion of a semantically empty element --- a null expletive --- to serve as matrix subject.

Given that raising must be viewed as an optional operation, the facts of certain complex ʔay constructions may be obscured. More specifically, the source of the intransitive 3-singular marking on the Vs in the sentences examined in section 3.1 remains ambiguous. It may be the case that the subject markings on the Vs correspond to a raised subject or to a null expletive. Sentences (20)-(21) serve as interesting examples. In each case the embedded NVs express *nature* phenomena and lack external arguments. There are two possible explanations for the presence of -s on the Vs: it may be the result of null expletive insertion applying both to the V and the NV; or it may be the result of null expletive insertion applying only to the NV and subsequent raising of that null expletive to serve as subject of the matrix clause.

(20) ʔay-s-k^{w}-c' ał-tẋ^{w}
happen-it Quote-Perf Prep-then
V

s-ʔa-suk'-s-k^{w}-c' ał-tẋ^{w}
Der-Loc-blow-it-Quot-Perf Prep-then
NV

It happened then that the wind was blowing.(17-65)

(21) ʔay-s-tu x-tx̣^{w} s-ʔax̣^{w} ʔamɬ-am-s
do-it-Conf Prep-then Der-Neg summer-CD-it
V NV NV

It really happened that there was no summer.(5-25)

Of course, native-speaker confirmation of the facts discussed in this section would be preferable. Ideally, the interpretations for sentences (12)-(19) should be ascertained for both the raising and the expletive constructions. Even so, the structural ambiguity of many sentences --- most notably those whose V NV pairs are marked for intransitive 3-singular --- may serve to obscure the underlying structure of certain complex ʔay constructions.

3.3 Evidence for a non-raising ʔay

Based on the data examined in previous sections, we can make certain predictions about the behavior of a predicate built on the root ʔay. ʔay lacks a thematic external argument and, in order to fill that semantically empty position, it triggers raising or null expletive insertion. This requires that the subject marking on the V agree in person and number with the subject marking on the embedded predicate, or that the V be marked for intransitive 3-singular irrespective of the subject marking on the NV. If the subject marking on the V NV pair does agree in person and number, then the V has the same subject referent as the NV. Finally, ʔay does not contribute any appreciable semantic content to the sentence.

Data which indicate that ʔay V plus NV constructions may in fact exhibit behavior inconsistent with these facts fall into four categories: those whose V NV pairs lack subject markings which agree in person and number; those whose V NV pairs exhibit subject marking agreement, but whose NV clauses retain the NPs which specify their respective subjects; those whose Vs exhibit transitive marking; and, one sentence in which the ʔay V seems to contribute meaning as indicated by the English translation. Of the more than 133 Bella Coola sentences which meet the V NV structural description, only twenty-one sentences exhibit such non-conforming behavior.

Example (22) is representative of the four sentences in which the subject markings on the V and the NV do not match. In this case, the V bears intransitive 3-plural, while the NV bears transitive 3-singular/3-singular.

(22) ʔay-na-k^{w}-tu-c' x-tx̣^{w}
do-they-Quot-Conf-Perf Prep-then
V

s-nuq'^{w}-ik-am-nix-is-k^{w}-c'
Der-divide-long horizontal axis-CD-LC-she/it-Quot-Perf
NV

ʔiɬ-ƛ'msta-yɬ ti-sunx^{w}-t'ayx
NProx-person-Dist Prox-world-Prox

They were doing that when a/the woman divided the world.(7-24)

Examples (23)-(24) are representative of the twelve sentences which bear corresponding subject markings, yet have lexical subjects appearing in their NV clauses. In (23) the NV clause contains a NP which specifies its subject. In (24) both the V and the NV clauses contain NPs which specify their respective subjects.

(23) ʔaay-na-k^{w}-lu-k'^{w} s-sunq'-uc-aw wa-ax^{w}ɬ
do-they-Quot-Expv-Usit Der-start Redp-mouth-they Prox-some
V NV NP

s-tx-apsm-tim-tu-c'
Der-cut-neck-Pass-Conf-Perf

Some of them were just yawning when they had their throats cut.(16-116)

(24) ʔaɬ-ʔay-naw-k^{w}-c' t'ax̣^{w}
Res-do-they-Quot-Perf those ones
V NP

s-ʔaɬ-k'iɬ-tut tu-ƛ'msta-tx̣^{w}
Der-Res-be without-C they/it NProx-person-Dist
NV NP

ta-wina ka-puƛ'-us-m-s
NProx warrior Unr-come-face-MP-he

What they did was wait for the warrior to appear.(3-61)

Example (25) is representative of the four sentences in which the V bears transitive morphology. Here the V is marked for Causative-Passive 3-singular.

(25) ʔay-tum-k^{w}-c' iɬ x-tx̣ s-ʔaɬps-tum
do-CPass-Quot-Perf she Prep-him Der-eat-CPass
V NV

She was made to eat by him.(9-97)

And finally, example (26) illustrates the only sentence which, despite the presence of corresponding subject markings on the V NV pair and the absence of an NP in the matrix or subordinate clause, must be categorized as non-conforming based solely on its English translation. In this case the ʔay V does seem to contribute appreciable meaning to the sentence.

(26) ʔaa ʔaɬ-ʔay-s-k^{w}-tu-tu-ku aɬ-tx̣^{w}
ah Res-do-he-Quot-Conf-Conf-Surp Prep-then
V

s-sq'ak-tum
Der-scratch hand-CPass
NV

Ah, he did exactly as planned then when he was scratched.(1-103)

One possible explanation for the twenty-one anomalies might be that there are, in fact, two ʔay morphemes, one raising and the other non-raising. A variety of data is available to support an analysis which recognizes the two. Consider the Bella Coola sentences which follow. In (27)-(28) the ʔay predicate represents the only predicate in the sentence. This indicates that ʔay contributes semantically to the sentence and that it does not necessarily subcategorize for a NV complement. Furthermore, these ʔay predicates appear with noun phrases which specify their subjects; that is, in these examples ʔay does not lack a thematic external argument.

(27) ʔay-s ʔaɬ-tx̣^{w} ta-ƛ'msta-tx̣
do-he Prep-then NProx-person-Dist
V NP

A person did this then.(1-4)

(28) ʔaɬ-ʔay-s-k^{w}-k'^{w}u ta-nanmk'-tx̣ aɬ-tx̣^{w}
Res-do-he-Quot-Usit NProx-animal-Dist Prep-then
V NP

The animal was doing as he had before.(1-131)

Sentences (29)-(30) provide additional evidence of the theta-marking capabilities of ʔay. The ʔay V in (29) bears the Causative-Active 3-singular/3-singular suffix, indicating that the verb has two arguments and assigns two theta-roles. In (30) the ʔay is marked with the Causative-Passive 3-singular suffix, indicating that its external argument has been suppressed.

(29) ʔay-tus-k^{w}-tū ʔaɬ-ta-suxa-s-tx̣^{w}
do-C he/it-Quot-NContr Prep-NProx-arm-his-Dist
V

And he would do it to his arms.(2-90)

(30) ʔaɬ-ay-tum-k^{w}-i-c'i-k ta-ƛ'msta-tx̣
Res-do-CPass-Quot-Contr-Perf NProx-person-Dist
V

This person was fixed like that.(1-43)

Given these facts it seems reasonable to assume that there are two ʔay morphemes in Bella Coola, one raising and the other non-raising. Non-raising ʔay may prove to be a pro-form which obtains its semantic content contextually, not unlike the English pro-verb *do*. There is evidence to suggest that it obtains its argument structure in the same way. A discussion of non-raising ʔay is, however, beyond the scope of this paper. I take the view that the twenty-one anomalies are examples of non-raising ʔay, and as such they do not contradict the facts of raising ʔay.

4.0 THE PROPERTIES WHICH CHARACTERIZE RAISING ʔay

Certain properties distinguish raising ʔay from non-raising verbs. Raising ʔay can be characterized as an unaccusative verb; that is, one which lacks a thematic external argument and which fails to assign accusative case (Burzio (1986)). As such, it triggers certain processes: the raising of the subject of the embedded clause -- *pro* or a lexical NP -- to matrix subject position, or the insertion of a null expletive to serve as matrix subject. The data indicate that the only argument eligible for raising to the ʔay clause is the subject of the embedded clause. In no case is the object of the embedded NV raised. Evident also is the fact that the ʔay V contributes little, if any, appreciable semantic content to the sentence in which it occurs.

5.0 THEORETICAL CONSIDERATIONS

In order to adequently account for the facts of complex ʔay constructions, certain issues must be clarified. Most notably, the nature of the boundary between the matrix and embedded clauses must be identified. Rivero (1987a,b) argue that for Romanian and Modern Greek this is a CP boundary and propose a mechanism of morphological agreement to account for the transparency of C. These analyses also "preserve VP as a barrier for material it contains." This structural requirement is particularly relevant for complex ʔay constructions in Bella Coola since in no case does an object of an embedded clause raise to become the subject of the matrix clause. Objects which have already undergone passivization are, however, eligible for raising.

Another issue which requires clarification is that of case assignment. If raising is viewed as a movement operation, then an NP-trace must be understood to remain in subject position in the embedded clause. As NP-trace is unable to receive case, Rivero (1987b), following a suggestion in Rizzi (1982), proposes that Case Absorption operates in the lower clause of a raising structure much as it does in a passive structure.

Finally, the issue of optionality must be addressed. Given the fact that Bella Coola has a rule of null expletive insertion and that the case-marking requirements of the embedded subject NP have been met, it becomes necessary to ask why the option of raising is even available. I suspect that discourse factors figure significantly in the choice between the expletive insertion and raising options.

Table 1: Pronominal Inflection (Davis and Saunders (1980))

Intransitive

Agent	Singular	Plural
1	-c	-iɬ
2	-nu	-nap
3	-s / -0	-naw

Transitive-Active

	Patient	Singular			Plural	
	1	2	3	1	2	3
Agent						
1	---	-cinu	-ic^{w}		-tułap	-tic^{w}
Sg 2	-cx^{w}	---	-ix^{w}	-tułx^{w}		-tix^{w}
3	-cs	-ct	-is	-tuɬs	-tap	-tis
1		-tułnu	-il	---	-tułap	-tiɬ
Pl 2	-cap		-ip	-tułp	---	-tip
3	-cant	-ct	-it	-tułt	-tap	-tit

Transitive-Passive

	Singular	Plural
1	-tinic	-tiniɬ
2	-ct	-tap
3	-im	-tim

Causative-Active

	Patient	Singular			Plural	
	1	2	3	1	2	3
Agent						
1	---	-tuminu	-tuc^{w}	---	-tumułap	-tu tic
Sg 2	-tumx^{w}	---	-tux^{w}	-tumułx^{w}	---	-tutix^{w}
3	-tum	-tumt	-tus	-tumuɬs	-tutap	-tutis
1	---	-tumułnu	-tuɬ	---	-tumułap	-tutiɬ
Pl 2	-tumanp	---	-tup	-tumułp	---	-tutip
3	-tumant	-tumt	-tut	-tumułt	-tutap	-tutit

Causative-Passive

	Singular	Plural
1	-tuminic	-tuminiɬ
2	-tumt	-tutap
3	-tum	-tutim

Table 2: Abbreviations

Abs	Absolutive	LC	Limited Control
Att	Attemptive	LCDev	LC Developmental
Aux	Auxiliary	LCRes	LC Resultative
C	Causative	Loc	Location
CD	Controlled Developmental	MP	Mediopassive
CPass	Causative Passive	Mid	Middle
CRefl	Causative Reflexive	NContr	Noncontrastive Conjunctive Particle
Conf	Confirmative		
Cont	Continuative	NProx	Nonproximal
Contr	Contrastive Conjunctive Particle	Neg	Negation
		Opt	Optative
DP	Distant Past	Part	Partitive
Der	Derivation	Pat	Patient
Dim	Diminutive	Perf	Perfective
Dir	Direction	Pers	Persistive
Dist	Distal	Pl	Plural
Distb	Distributive	Prep	Preposition
Dub	Dubiative	Prox	Proximal
Expb	Expectable	Quot	Quotative
Expv	Expectative	Recip	Reciprocal
IC	Indirect Control	Redp	Reduplicated
Impf	Imperfective	Refl	Reflexive
Impv	Imperative	Res	Resultative
Inch	Inchoative	Sim	Simulative
Incomp	Incomplete	Surp	Surprisative
Ind	Individuative	Tr	Transitivizer
InfDub	Inferential Dubiative	Unr	Unrealized
Inst	Instrument	Usit	Usitative
Intr	Intransitivizer		

NOTES

1 For a detailed grammatical description of Bella Coola, see Davis and Saunders (1978, 1980, 1984) and especially Nater (1984).

2 The source for these three Bella Coola sentences is Davis and Saunders (1978).

3 For a complete listing of the Bella Coola paradigms, see Davis and Saunders (1980). For a more detailed morpheme segmentation of the transitive suffixes, see Nater (1984).

4 See Table 1 for a detailed listing of the Bella Coola person markers mentioned in this paper. See Table 2 regarding gloss-line abbreviations.

5 The source for these and all subsequent sentences is Davis and Saunders (1980). The glosses and English translations are those of Davis and Saunders. The numbers placed after each translation correspond to the particular text and line in which that sentence appears.

6 For additional remarks regarding the stylistic importance of -s in nonembedded clauses, see Davis and Saunders (1978), footnote 5.

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THE SCOPE OF THE VERBAL SUFFIX OF ASPECT IN ATHAPASKAN

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1.0 INTRODUCTION

Recent research (Cutler, Hawkins & Gilligan 1985) on the morphological universals evidenced by the languages of the world has shown that while languages may or may not make use of prefixes, almost[1] all languages made significant use of suffixes, and languages typologically similar to Athapaskan, i.e., having OV word order and postpositions, are particularly inclined to make very extensive (in many cases, exclusive) use of suffixes. Indeed, a survey of over 350 languages found it to be an exceptionless universal that "(10) if a language has NP + Po, MOOD affixes on V (if any) are suffixed" (Cutler, Hawkins & Gilligan 1985:729). Yet suffixes are rarely mentioned in the Athapaskan literature, and then primarily in the context of nouns.[2]

Nevertheless, the Athapaskan languages do have suffixes, and it is the purpose of this paper to show that the Athapaskan languages have a verbal suffix which could be seen as satisfying the morphology universal given above. It is perhaps not surprising that so little attention has been paid to suffixes in Athapaskan. First, the number of suffixes in any Athapaskan language pales in comparison with the vast inventories of prefixes present in all the languages of the family. Furthermore, the relative ordering of the prefixes presents a problem unparalleled in the suffixes. Secondly, phonological change in some of the better known Athapaskan languages, in particular a restriction on the segments allowed in syllable codas, has made it difficult to determine which suffix is present in any given situation. In Slave, for example, "syllable-final neutralization of stem-finals to [h] and loss of certain stem-finals has led to a situation where patterns of stem variation are rather obscure" (Rice 1989:803). Thus, although Athapaskanists have recognized since the time of Sapir's 1915 paper "The Na-Dene languages, a preliminary report" (Hardy 1979:40) that in a certain sense every verb stem consists of a root and suffix,[3] in Athapaskan circles it is common to deal with the stem as a single unit and to speak of co-occurrence relations between given prefixes and given stems, rather than trying to relate the occurrence of prefixes with suffixes.

One notable exception to this practise is that of James Kari, who while sometimes using the term *stem* to refer to the combination of the verb root plus first possible suffix, always includes a explicit statement of the verbal suffix involved in his more detailed derivations of Ahtna verbs. He is aided in this by the fact that the Alaskan Athapaskan languages are phonologically more conservative than the languages of other branches and have had less simplification in syllable codas than most other languages of the family, which results in the verbal suffixes being more easily recognizable. This greater visibility (and regularity in occurrence) of the verbal suffixes provides greater internal evidence motivating a synchronic analysis of the verb stem into root and suffix than can be found in those Athapaskan languages with a more innovative phonology (Rice 1989:950). For this reason, our discussion of the Athapaskan verb suffixes will focus in Section 2 on the Ahtna verb complex, whereby both the form of the suffixes and their co-occurrence with other affixes will be discussed. At this point, cognates of the Ahtna verbal suffixes found in other Athapaskan languages, their form and function, will also be discussed.

While the cataloguing of the Athapaskan verb affixes and the discovery of their relative order is a task whose importance and size is not to be underestimated, some are of the opinion that if the study of the Athapaskan languages is to further our understanding of language per se, it is not sufficient to stipulate the ordering and co-occurrence of the affixes in a template. Rather, it is necessary to show how the principles of universal grammar manifest themselves in the Athapaskan languages. In Section 3, we will thus examine a proposal first presented in Speas (1990) and further developed in Speas (1991) and Rice (1990a), which argues for a syntactic treatment of the Athapaskan verb complex and shows that such a treatment can explain the ordering of Athapaskan verb prefixes in terms of principles applying to all languages, i.e., in terms of universal rather than language-specific principles.

In Section 4 we will take the analysis presented in Section 3 a step farther. It will be shown that the same facts which argue in favour of a syntactic treatment of the prefix complex also argue in favour of a syntactic rather than lexical treatment of the stem. If, however, the verbal suffix of aspect is recognized as a functional category in its own right, it must also be explained how it relates to the other categories. In particular, it must be explained why it alone among the functional categories incorporated into the Athapaskan verb complex follows the root. Some alternative answers to this question will be examined.

2.0 VERBAL SUFFIXES IN AHTNA AND OTHER ATHAPASKAN LANGUAGES

While there is a great amount of regularity across the Athapaskan languages in terms of the various affixes used and their functions, and there is agreement among Athapaskanists as to the categories present in general terms, there is less agreement when it comes to specifics. This is partly a result of terminological confusion, as is particularly well documented in Kari (1989), who, for example, shows that some 41 different terms have been used to describe the prefixes in what Kari calls the "qualifier zone" and that from one to nine positions have been identified in this zone depending on the researcher and language concerned. On the other hand, while variation among the Athapaskan languages with respect to the number of prefix positions is probably not as great as the various analyses might suggest -- Kari (1989: 449) estimates that "if the inventory of affixes and the numbering and labelling of the positions is treated as in Ahtna, most Athapaskan languages will probably have twenty or more linearly ordered prefix positions" -- there are clearly some real differences. Kari himself states (1989: 449) that "Koyukon, for example, has at least two or three more positions than does Ahtna".

2.1 The verbal affixes of Ahtna

Kari (1990:40/41 (Table 9)) gives the chart of the Ahtna verbal affix positions as follows:

(1)

PP	obj	Der/Them					Pronominal					
11		10		9	8	7	6			5		
A	B	C	B	A				F	E	D	C	B	A
3pS2	pob		der/th		iter	dist	inc	th	#	3y	dob	1p	indf	th	3pS1
k	s			ta	na	n	ta	x		b	y/O	ts'	c'	y	k
	n			O			da			k	s				
	nu		ni+	c'a			bes			c'	n				
	...	gha+	s+	ta			...				...				

Qualifier						Conjugation					
4						3				2	[1
F	E	D	C	B	A	D	C	B	A		
ar/qual	con	icp	qual	qual	qual	trn	spn	mode	prf	subj	clas
ko	u	t	d	n	gh	i	z/s	O	O	es	O
k				O				n	n	i	ł
					z			gh		oh	D
Stem								gho		O	l

0	-1	-2	-3	-4
root	vsf1	vsf2	vsf3	vsf4
CV(V)C	O	(h)e	(y)i	xu
CV(V)(R)(')	ł		nen	dze'
	n		ne	tah
	x		den	dah
	s			
	s			
	t			
	'			

It may be that the 32 positions represented here are, as Cook (1984:125) suggests, overdifferentiated. After all, there are eight null morphemes represented, whose presence is often debatable, some morphemes having different positions within the same zone can never simultaneously occur in the same word, and even Kari (1989) gives one less position than Kari (1990)! Nevertheless, while there is variation among the Athapaskan languages, sometimes even within the dialects of a single language,[4] as to the ordering of affixes within zones, there is general agreement among the languages as to which zones are represented and what order they occur in, with some categories (among them, the incorporated stem and the negative marker) being represented in some languages and not others. There are also differences in the ordering of the disjunct prefixes (in particular, those given as positions 7, 8 and 9 in the above chart) both among the languages and within the languages;[5] Rice (1990b) provides a thorough discussion and explanation of this variability in terms of scopal ordering of the morphemes, but a discussion of this proposal is beyond the scope of this paper.[6]

2.2 The Ahtna suffixes: true suffixes or enclitics?

In the chart of the Ahtna verb complex presented above in (1), there are four suffix positions given. It is, however, important to consider the question of whether these are all indeed suffixes needing to be accounted for in a description of the verb word, or are some of them merely enclitics, i.e., syntactically independent morphemes which are phonologically tacked onto the verb complex. While Kari does not speak of clitics in Ahtna, Leer (1979:38) does explicitly state that "the negative *+(h)e [Kari's vsf2] and the relativizers [Kari's vsf3 and vsf4] are here classified not as suffixes but as enclitics". But just how should suffixes be distinguished from enclitics? Although the definition of a clitic is hardly straightforward, that proposed by Zwicky and Pullum (1983), seems to be the most commonly accepted one. According to Zwicky and Pullum (1983:504), "morphophonological idiosyncrasies are more characteristic of affixed words than of clitic groups." With a few exceptions,[7] vsf3 and vsf4 do not interact with other morphemes. The vsf2 morpheme does inter-

act with the preceding morpheme, triggering voicing[8] of an underlying (non-glottalized)[9] obstruent[10] immediately preceding it, as in *i'eɬ ts'etniige* 'He doesn't know it' (theme: P+'eɬ ts'#D+niic+O+e; cf. *kones* 'he is alive, awake', theme: ko+O+niic+O), where vsf2 both prevents word-final spirantization of underlying (front velar stop) |c| to s,[11] and triggers deaspiration of |c| to g,[12] but this is hardly enough to disqualify it as an enclitic. Such phonological interaction between a clitic and its host is far from rare, occurring in many languages, such as Portuguese, where the encliticization of object pronouns to the verb "triggers certain allomorphic changes both in the pronouns themselves and in the word to which they attach" (Spencer 1991:363), although it seldom impedes the distinction of a clitic from its host. This certainly cannot be said of vsf1, however, whose presence, particularly when occurring with obstruent-closed stems, is often only indirectly detectable. A second criterion proposed by Zwicky and Pullum is selectivity. Clitics, they claim, "can exhibit a low degree of selection with respect to their hosts, while affixes exhibit a high degree of selection with respect to their stems" (Zwicky and Pullum 1983:503). In Ahtna, the vsf2, vsf3 and vsf4 morphemes may all attach to any verb, and vsf3 and vsf4 can also attach to stems of other categories; the Ahtna numeral *taa* 'three', for example, may combine with the plural human suffix (vsf3) *-ne* to produce *taane* 'three people', with the non-human suffix (vsf3) *-(y)i* to produce *taa'i* 'three things', with the temporal (vsf3) suffix *-de(n)* to produce *taade* 'three times' and with the general area (vsf4) suffix *-xu* to produce *taaxu* 'three ways'. The vsf1 morphemes, however, show a number of co-occurrence restrictions, as described below. A third criterion proposed is that of idiosyncracy. Zwicky and Pullum (1983:504) state that "semantic idiosyncrasies are more characteristic of affixed words than of clitic groups". While the Ahtna vsf2, vsf3 and vsf4 morphemes have a clear and consistent interpretation, it is often difficult to determine what the semantic contribution of the vsf1 morpheme to any given verb precisely is. Together, this seems quite strong evidence that whereas the vsf1 morphemes are indeed true inflectional suffixes, the vsf2, vsf3 and vsf4 morphemes are enclitics, whereby it must be noted that the vsf2 morpheme exhibits behaviour which is less typical of clitics than is that of the vsf3 and vsf4 morphemes. The remainder of this paper will thus focus on the form and function of the vsf1 morphemes, leaving the enclitics to be discussed at another time.

2.3.0 Relations between the Ahtna vsf1 and the verbal prefixes

Two kinds of verbal aspect are considered to be represented in the Athapaskan verb. The one kind, traditionally called **mode**, represents such aspects/modes/tenses as imperfective, perfective, future and optative, while the other, traditionally called **aspect**, represents such aspects as durative, momentaneous, persistive and semelfactive. Morphemes representing the former are found in zones 3 and -1 of (1), while morphemes representing the latter are found in zone 4. Each verb requires a particular conjugation pattern, i.e., it is lexically marked to co-occur with a set of conjugation markers for the imperfective, perfective, future, optative and perfective-negative.

2.3.1 Co-occurrence between the vsf1 and mode prefixes

In all the Athapaskan languages, verb roots and derivational affixes combine idiosycratically as polymorphemic lexical items to represent specific meanings. To these groupings, called verb themes, are added aspectual and conjugation markers to derive the verb bases, and each verb base is associated with a conjugation pattern, which determines which inflectional affixes will be added. Each Ahtna verb theme is associated with a set of conjugation patterns, each of which consists of a set of markers (specific morphemes associated with the modes imperfect, perfect, future and optative) which are used in the expression of the various (secondary) aspects. Kari (1990:56) iden-

tifies 14 conjugation patterns, of which six are used only with the neuter aspect, while the other eight are used with the other aspects. The different conjugation patterns are not used to an equal extent. Pattern 1, which has the same manifestation as Pattern 9, is associated with the largest number of different aspects, being used with the gh-momentaneous, durative, customary, durative-continuative, persistive, gh-reversative, onomatopoetic, directive and consecutive aspects. Pattern 2 is used with just two aspects, and pattern 3 is used with three. The other patterns are less used, most with just one aspect each.

Each conjugation pattern consists of four conjugation "types". Kari (1990:55 (Table 13)) identifies 24 conjugation types, combinations of prefixes and suffixes, in Ahtna from which the conjugation patterns are made up. Although many conjugation types can be labelled in terms of the mode prefix required, almost all require the presence of a non-null suffix. This will be taken to be indicative of the non-marginal status of vsf1 in Ahtna.

2.3.2 Co-occurrence between the vsf1 and aspect prefixes

It is clear that there are co-occurrence restrictions between conjugation/mode prefixes and vsf1 morphemes. There also seem to be some co-occurrence restrictions between aspect prefixes and vsf1 morphemes. Such restrictions are well known in Athapaskan, although often presented as the set of restrictions on the co-occurrence of aspects and verb stems. For Ahtna, Kari (1990:663/664 (Table 16)) has worked out the co-occurrence restrictions between the use of specific aspects and the presence of given vsf1 morphemes. Aside from obvious conditioning effect of the coda element, which Leer (1979) shows to be pervasive throughout Athapaskan, two things are of particular interest here. First, some aspects clearly subcategorize for a specific suffix; the semelfactive for some kind of obstruent, the consecutive for vowel reduction (typically indicative of a following consonant cluster in the proto-language), the directive for vowel lengthening (which although not obviously a suffixal process, may have originated through affixation), the neuter and onomatopoetic for -n, the reversative and persistive for -x and the repetitive for -s. On the other hand, certain modes are also consistently associated with vsf1 morphemes, such as the Perfective with -n, the Perfective negative with -ɬ, and the Future with -x and -ɬ.

2.3.3 The content of the vsf1 morphemes

In Ahtna, each vsf1 morpheme regularly cooccurs with a position 3 prefix to constitute the conjugation types exemplified discussed above. This would seem to imply that the vsf1 morphemes, like the position 3 prefixes, have the role of defining verb conjugation in Ahtna. Now it is known that the position 3 prefixes of the Athapaskan languages also have other functions or, as Rice and Hargus (1989) have argued, are intimately associated in a phonological blend typical of inflectional morphemes with morphemes having other functions. These functions have given rise to these morphemes being called modal prefixes or primary aspect prefixes, and indeed both morphemes representing mode[13] (optative in Ahtna and Slave) and morphemes representing aspect (perfective in Ahtna and Slave, imperfective as well in Slave) are found in this position. Navajo also has a morpheme representing future tense in this position, which Speas (1991) uses as evidence supporting her claim that this category is comparable to the Tense category in other languages. This array of properties may at first seem irreconcilable, but the system can be seen to reflect a primary opposition between the two modes of realis (indicative) and irrealis, with perfective representing realis and (ptative irrealis in Ahtna. In Slave and Navajo, a secondary opposition between specifed and unspecified point in time is added, with perfective and future representing a specified point in time

and imperfective and optative representing an unspecified point in time. If then the vsf1 morphemes are identified with the position 3 prefixes not only as conjugation markers but also as markers of mode, otherwise known as MOOD, the morphological universal (10) found by Cutler, Hawkins and Gilligan (1985:729) can be said to hold for Athapaskan, as these NP + Po languages will have MOOD affixes suffixed on V -- they will also have MOOD affixes prefixed on V, but that does not contradict any discovered language universal, and affixal bracketting may be rare among the languages of the world, but is not unknown.

2.4 The verbal suffixes from a historical perspective

It is these regularities in Ahtna and other Athapaskan languages which have enabled Jeff Leer (1979) to reconstruct the Proto-Athapaskan verbal suffixes and assign them meanings as follows: *-ỹ (perfective), *-ɬ (progressive, negative perfective), *-x̣ (reversative), *-k (repetitive-customary), *-x (semelfactive non-perfective), *-t (semelfactive perfective), *-ts' (? [very rare]). Leer also considers many PA stems to have ended in a glottal stop, but he considers the glottal stop to be part of the root rather than a suffix. Kari (1990:70) considers the vsf1 morpheme -' to be a "perfective, distributive suffix; attaches to CVV roots in the neuter perfective and optative, durative perfective, transitional perfective; the distributive imperfective, future, and optative; and the momentaneous optative". The perfective suffix *-ỹ has come into Ahtna as -n, but can only be seen as such with open stems. When suffixed to closed stems, its presence is seen in the lack of spirantization of the root-final obstruent as in *nak* 'endure', for which the perfective form ends in k and imperfective, future and optative forms end in x (Kari 1990:294). The suffix *-ɬ has been retained in Ahtna as the "progressive/future/perfective-negative suffix" (Kari 1990:262) without change. It is one of the most visible of the verbal suffixes, being retained after open roots and after closed roots ending in *t (where *t is dropped before *-ɬ); in Koyukon, it is retained after all closed roots as *-tɬ*, as in Koyukon *'astɬ* 'a few go' (Leer 1979:45), which corresponds to Ahtna *'as* (Kari 1990: 79). Sarcee also retains *-ɬ after some obstruent-closed stems although with irregularity due to phoneme merger, and Hupa suffixes -'ɬ to closed roots, which Leer (1979:45) sees as "a late addition by analogy with open roots." The suffix *-x̣ has been retained without change[14] in Ahtna as the marker of reversative aspect (also appearing in the persistive, transitional, durative-customary and neuter-customary stem sets) and is found overtly only with open roots. Both the *-k and *-x suffixes have also survived in Ahtna, but with a change in phonetic form and limitation of function. Both these front velars shifted to *s* in Ahtna, which is why two -s vsf1 morphemes appear in (1); Kari (1990:447) defines the first as the customary suffix, and the second as the momentaneous imperfective suffix (also occurring in the imperfective of the perambulative aspect). In Ahtna (and Tanaina), both of these suffixes drop after obstruent-closed roots, but *-k appears after some obstruent-closed stems in other Athapaskan languages, coalescing with stem-final *t to *k in Koyukon, Sarcee and Navajo and metathesizing with root-final *ɬ in Koyukon to produce *xtɬ* (Leer 1979:48). The *-t suffix survives in Ahtna in *s-* transitional perfectives such as *yunest'iit* 'he fell in love with her', but is uncommon and found only with open roots. In Sarcee, however, it remains in common use as the semelfactive perfective suffix, even appearing after root-final (fricative) obstruents as in *tȃst* 'to spot' and *gȗɬt* 'to hit with a fist' (Cook 1984:235).

3.0 A HIERARCHICAL ORDERING OF THE ATHAPASKAN VERB COMPLEX

The Athapaskan verb complex has long posed a problem for the theory of morphology because of its placement of inflectional morphemes between derivational morphemes and the root: this would seem to be a violation of the Lexical Integrity Hypothesis, which states that constituent-

structure processes -- in which inflectional morphemes participate -- cannot look inside the internal structure of a word. The processes of concatenative and non-concatenative morphology adequate to describe most other languages of the world seem inadequate here, which has lead some researchers such as Hargus (1986, 1988) and Rice (1985, 1989) to posit a templatic morphology for Athapaskan. This model allows the syntax to access the slots in which the inflectional morphemes has been placed, regardless of their position within the word. Thus, Kari (1990) "generates" an Ahtna verb starting with a lexically derived template in which some slots are initially filled to define the basic meaning of the verb being generated (the root, classifier and, as needed, thematic prefixes); this Kari calls the verb theme. Next derivational elements (aspectual prefixes, "gender" markers, incorporated objects) are added in their appropriate slots, which may be before or between the elements already specified, to form the verb base. Finally, the inflectional elements (subject, object markers) are added to get the underlying form. To this items of the "post-flectional lexicon" (markers of relativization and nominalization) are added and phonological rules applied to produce the phonetic form.[15] The process is exemplified in figure (2).

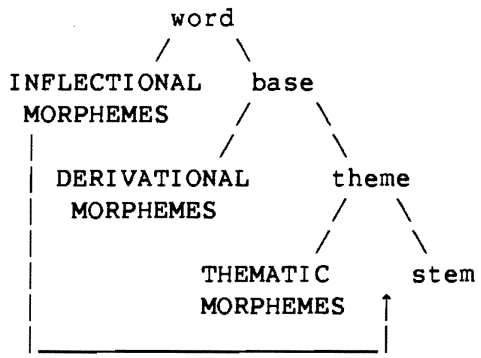
The template model, however, has a number of disadvantages. It marks the Athapaskan languages as exceptional among the languages of the world, does not have a good mechanism (*pace* Spenc-

er 1991) for expressing the kind of word-internal dependencies between non-adjacent morphemes found in the Athapaskan verb complex, is unable to explain variability in the position of some prefixes, in particular the distributive and iterative prefixes (positions 8 and 9 respectively in figure (1)), and it is unable to account for some important generalizations noted by Speas. Thus, an alternative has been sought in a syntactic approach to the Athapaskan verb complex.

3.1 A syntactic approach to Athapaskan verb morphology: infixation

For the past decade[16] Margaret Speas has consistently argued that Navajo (and probably also the other Athapaskan languages) can be dealt with in terms of the same model and the same principles as all other languages of the world. While proponents of the templatic model have argued that only a template could account for the access of the syntax to inflectional morphemes which are between derivational morphemes and the verb stem, Speas (1990) has claimed that at D-structure, where syntax interacts with the lexicon, the inflectional affixes are indeed outside of the derivational ones, as shown in (3) (Speas 1990:253 (figure 85)), and then move into the position betwen the derivational morphemes and the stem:

(3)



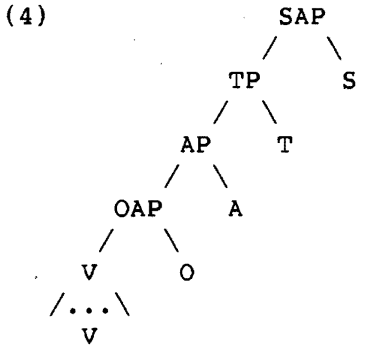
But deriving the Navajo verb complex from a morphosyntactic structure as in (3) would seem to violate the Mirror Principle proposed by Baker (1985, 1989) and Gerdts (1981), stated as "Morphological derivations must reflect syntactic structure (and vice versa)"[17] (Baker 1989:13) unless the ordering of inflectional and derivational morphemes is not a morphological, but rather a phonological derivation. In other words, Navajo (and other Athapaskan languages) could be seen as respecting the Mirror Principle if their inflectional morphemes were in fact infixes whose environment for insertion is phonologically rather than syntactically defined. Precisely this is what Speas claimed. Speas follows Wright (1983) in assuming that in Navajo "conjunct prefixes are underlying consonants and disjunct prefixes are open syllables" (Speas 1990:257). Rice (1990a) makes a similar although not so radical claim for Slave, noting that "in general, [Slave conjunct morphemes] have a uniform phonological form, C, with an epenthetic vowel, ... This contrasts with the disjunct morphemes, which are CV, CVC, CVCV, and CVCVC in form" (Rice 1990a: 20).[18] This is also true of Ahtna, although Ahtna also has a number of disjunct morphemes with the form C, which cannot constitute a prosodic word by themselves. But while there are apparent exceptions to these generalizations, such as the Navajo conjunct prefixes *ho*, *o* (mode prefix), and *'a* (deictic subject) and the Slave and Ahtna prefixes *u*[19] and *ah/oh*, Ken Hale's suggestion (Speas 1990:284), according to which the Navajo "exceptions" should be analysed as having the underlying forms *hwi*, *wi* and *'i* respectively, seems very promising.[20] In a templatic model, this phonological distinction between disjunct and conjunct morphemes is mere coincidence, while Speas' proposed

using these facts to define a phonological framework for the insertion of the inflectional morphemes. Thus, given the choice between the infixation model, which accounts for the phonological facts observed and claims that the Athapaskan languages obey the morphological universals observed in other languages of the world, and the templatic model, which ignores these phonological facts and violates the morphological universals, it is indeed "in the interest of maintaining a restrictive theory of morphological typology" to adopt the infixation model presented in Speas (1990).

3.2.0 Another approach to Athapaskan morphology: functional categories

In addition to the infixation model and the templatic model, a third choice has been provided. Pollock (1989) and Chomsky (1989) have argued that morphemes representing semantic categories such as agreement, tense and aspect are hierarchically ordered under INFL with each category having a functional head dominating its own phrase. The similarity in the order of the functional categories found by them and others has given rise to the claim that the underlying order may be the same in all languages,[21] even if not all languages represent all categories. Chomsky (1989) proposes for English and French the basic order of functional categories: [Subject Agreement [Tense [Object Agreement [Verb]]]]. Further work on Greek (Rivero 1990), Finnish (Mitchell 1989) and Basque (Laka 1988) has shown that languages will order an aspect marker between the tense marker and the Object Agreement marker and they will order a voice marker[22] between the Object Agreement marker and the Verb stem, giving us the universal order [SAG [T [ASP [OAG [VOICE [verb]]]]]]. Dismissing the disjunct prefixes as proclitics, as was suggested as early as Cook (1984:124) and thoroughly discussed in Rice (1990a),[23] Speas looks at the conjunct prefixes of Navajo and finds four functional categories represented and occurring in the order: OAG ASP T SAG [verb]. Surprisingly (and unexplicably, if we were to adopt the template model for Athapaskan), these categories are represented in the same order as in all other languages ... although in the opposite order and with the verb stem at the "wrong" end of the chain. Since the Athapaskan languages are right-headed, unlike the left-headed languages examined earlier in this model, it is not surprising that the categories appear in the opposite order to that found in European languages, nor does it imply a difference in hierarchical ordering, shown in (9) taken from Speas (1991:190, figure 15), given the standard assumptions of X-bar theory Speas is operating under. What is, however, surprising, is that the verb stem is found adjacent to the Subject marker rather than the Direct Object marker.

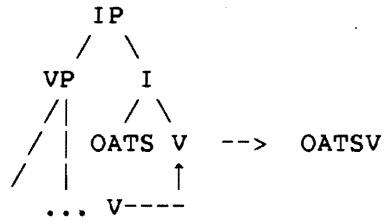
(4)



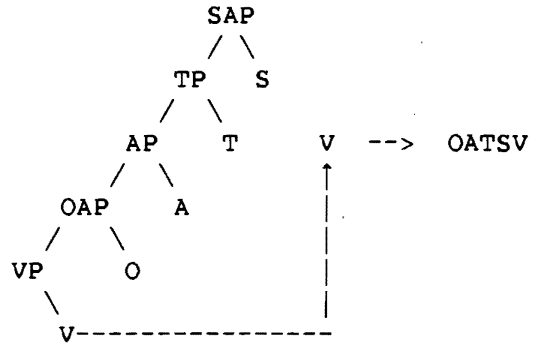
3.2.1 Reconfiguring the Athapaskan functional categories

Starting from the assumption that the Athapaskan languages, or at least Navajo, have structures parallel to those of other languages and that agreement is a local configurational phenomenon, Speas examines the possibilities within Incorporation Theory and finds six logically possible derivations in which the verb stem would follow the functional heads, which are the following:

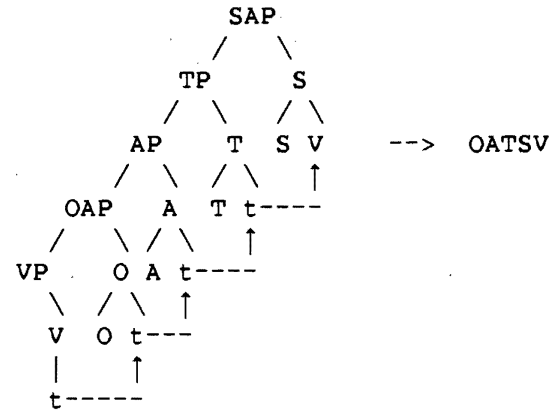
(5) Heads final; INFL forming in the lexicon; V-raising over INFL (Speas 1991:190)



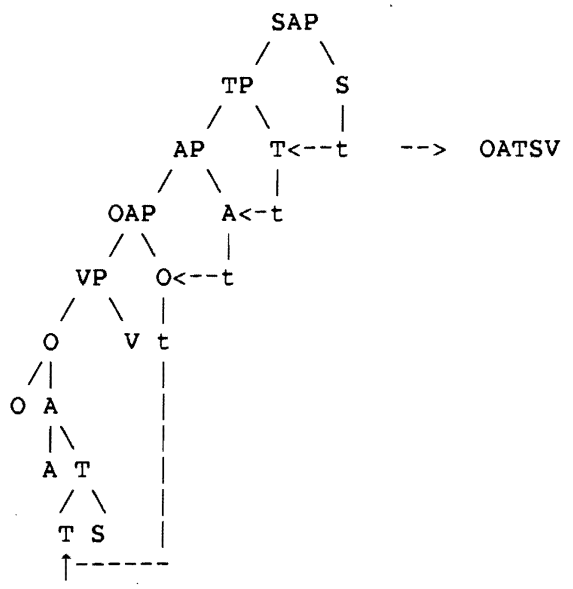
(6) Heads final; fell swoop movement; string-vacuous affix raising (Speas 1991:191)



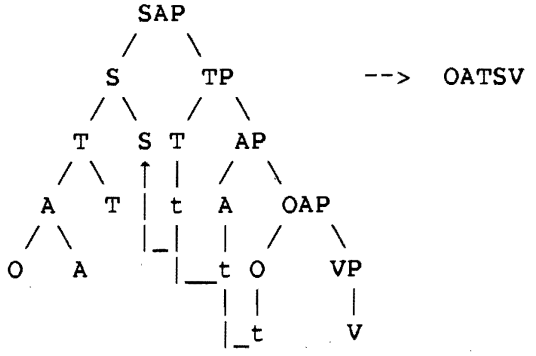
(7) Heads final; successive cyclic movement of V; string-vacuous raising of others (Speas 1991:191)



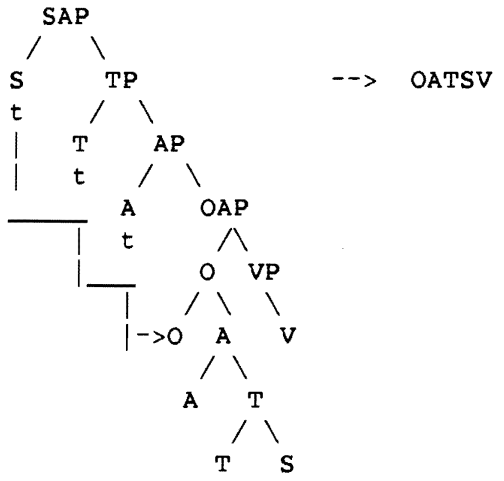
(8) Heads final; string-vacuous INFL lowering; hopping over verb stems (Speas 1991:192)



(9) Functional heads initial; affix raising of INFL, suffixation of verb stem (Speas 1991:193)



(10) Functional heads initial; affix lowering of INFL, suffixation of verb stem (Speas 1991:193)



These derivations all involve a number of assumptions which are somewhat controversial. First, Speas assumes that direct object prefixes and deictic subject prefix together constitute the category of Object Agreement following Sandoval & Jelinek (1989) and Willie (1989), who argued that the deictic subjects actually represent patients (and thus are, in a sense, direct object markers). Also, the existence of the Tense node in Athapaskan is disputable. Although Speas considers the mode prefixes to be "the closest Navajo analogue of Tense", she herself cautions that "it is incorrect to assume that they translate precisely as tenses into English" (Speas 1991:189). However, not all categories of the universal hierarchy need be represented in a given language -- in the analysis of Chomsky and Pollock, for example, neither English nor French represent Aspect or Voice in the verb complex. Thus, an alternative to Speas' analysis might argue that Tense is not represented in Athapaskan at all and that the mode prefixes represent a subcategory of Aspect,[24] as proposed by Rice (1990a); this would seem to reflect the facts of the Athapaskan verbal system somewhat more directly. Furthermore, Speas is ignoring the disjunct prefixes, which she assumes to be clitics, "for the sake of simplicity" (Speas 1991:188). While her assumption that these prefixes are in fact clitics is well supported in the Athapaskanist literature, it is questionable whether this alone justifies leaving them aside from consideration in an analysis of Athapaskan verbal morphology which is, essentially, a syntactic one. Since adverbial elements, in particular the iterative and distributive morphemes, and incorporated direct objects (in Northern Athapaskan languages -- Navajo does not incorporate objects into the verb) seem to have scope over verbs, it would seem reasonable for them to appear above the verb root in D-structure, which is what Rice (1990a:24) proposes. This aspect of the theory clearly needs more discussion.

3.2.2 The best configuration

Speas examines each of the six configuration presented above to determine its suitabilty as a proper representation of Navajo verbal morphology. The derivation presented in figure (5) is rejected by Speas on the grounds that "if the inflectional elements are put together in the Lexicon, there is no way for the syntax to have access to their hierachical arrangement without making reference to the internal structure of a word" (Speas 1991:195). Since the reason for proposing a syntactic analysis of the Athapaskan verb complex was to allow syntax access to the inflectional elements, Speas quite rightly concludes that such a derivation would be self-defeating.

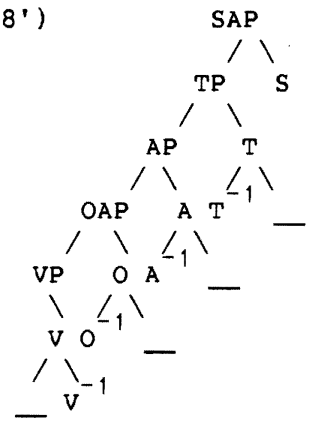
The derivation presented in figure (6) is the one adopted by Rice (1990a, 1991) and refined by her to differentiate all the conjunct prefixes as well as include the disjunct morphemes. A basic assumption being made here is that it is possible to move the verb stem in one fell swoop past all the functional categories without violating the ECP. Baker and Hale (1990) have claimed that this is indeed so, on the grounds that functional heads do not block antecendent government by lexical heads. Since the raised V is still the closest lexical head to the trace it should be able to properly govern it. Speas (1991), however, rejects this approach, citing Li (1990) who has argued that movement in the verb must be restricted. Li shows that verb incorporation occurs only out of a bare VP complement and not out of a tensed clause. This is only relevant, however, if Athapaskan has tensed clauses. Speas clearly feels it does, but as argued above, it could be said that Athapaskan languages mark Aspect but not Tense: in such a case, perhaps the derivation presented in (6) is indeed an appropriate one. Since it is unlikely that Li's proposal, mentioned (Li 1990: footnote 19) as having being adopted by Hale & Keyser (1988), was not taken into consideration in Baker & Hale (1990), it seems possible that its effects are not as far-reaching as Speas understands them to be.

In the derivation represented in (7), the verb moves cyclically from head to head and leaves a trace at each step but does not bring the host with it to the next step. Following up on a suggestion in Baker (1989) that traces are not allowed to occur within a word, Rizzi and Roberts (1989) have argued that 'excorporation' (moving on from an incorporated position without taking the host along) is disallowed in substitution, i.e., movement which takes place to satisfy a morphological subcategorization frame; in other cases, adjunction is involved and excorporation is allowed. Since the Athapaskan prefixes are all bound morphemes, any movement to one of the functional head positions is substitution and excorporation is not allowed. Thus, the derivation in (7) is not possible.

Unlike Sandoval & Jelinek (1989) and Willie (1989), Speas considers Navajo NPs to be arguments of the verb. Since they do not bear overt Case marking and occur in a rigid order, she assumes "that they receive structural Case, and that the object is within the projection of Object Agr, while the subject is an immediate daughter of Subject AgrP" (1991:197). Given these assumptions, it should not be possible to raise the verb stem to the position of Subject Agr, as in (9), "because then the verb + INFL complex would precede the direct object" (Speas 1991:197). If, however, one were to accept the view of Hale (1983) and others that all argument positions are satisfied within the Athapaskan verb and that Athapaskan NPs are actually adjuncts, Speas' objection does not hold.[25]

Refining the Rizzi-Roberts theory of substitution, Speas proposes that the operation of substitution be restricted to those cases of moving into an available position. From this follows that in Navajo substitution must involve the head being lowered onto a morpheme within that head's subcategorization frame; Speas considers the fact that the OAGR morpheme does not occur on intransitive verbs to provide evidence that this hypothesis is correct. Thus, the D-structure of (8) with the morphological subcategorization positions added looks like (8').

(8')



From this, it is clear that in (8) the inflectional morphemes follow their syntactic complement but precede their morphological complement. Speas suggests, citing evidence from Basque and Dutch, that the projection of morphological subcategorization frames obeys X-Bar theory. If she is correct, (8) is not an admissable representation of Athapaskan verbal morphology.

Thus, (10) remains the representation of Athapaskan verb morphology not eliminated,[26] and it is this representation which Speas accepts in her 1991 paper. In this derivation, the functional heads are to the left of their complements, which seems odd for a language with postpositions and a "rather rigidly SOV" word order. Nevertheless, this is Speas' claim, and Speas (1991) provides various pieces of evidence from Navajo which seem best analysed by saying that in this language, functional heads precede their complements, while lexical heads follow their complements. While some of these (the lexical character of COMP, the position of the negation particles, the content-question particle and the focus particle) may not have counterparts in all the Athapaskan languages, the argument that the pronominal element co-occurring with postpositions is an agreement morpheme which always precedes its complement is certainly applicable throughout Athapaskan.

This derivation, unlike the rejected ones, does not allow movement past functional categories. Rather, it requires the incorporation through adjunction of the functional categories in accordance with X-bar theory (i.e., both syntactic and morphological complements must be on the same side of the head) to build up the complex of functional categories, effectively reversing their order. Speas therefore concludes that this is the only permissable derivation for the surface form of the Navajo verb complex, and since there is only one possible derivation, the Affix Consistency Constraint, given in Speas (1991:186-187) as "If af[fix] subcategorizes for XP in syntax, then af is adjacent to X at PF", is not required as a specific condition on the Grammar.

In this section it has been shown that of the six derivations for the Navajo verb complex consistent with the Universal D-structure presented in section 3.2.0 and some version of the Affix Consistency Condition, only one (10) is permitted given Speas' additional constraints. Each of the other derivations are rejected on the basis of a single criterion, which, particularly in the case of (6) and (8), may warrant further examination.

4.0 THE POSITION OF THE VERBAL (VSF1) SUFFIXES IN THE AHTNA VERB COMPLEX

In the syntactic analyses of the Athapaskan verb complex presented above, the verbal suffixes (as opposed to the verbal enclitics, as discussed in section 2.2) are considered to be combined with the root in the lexicon. It will be argued here that while such as analysis may provide an adequate description of the observable phenomena in Slave or even Navajo, it is inadequate for an analysis of the Ahtna verb complex.

4.1 Verbal suffixes, like conjunct prefixes, are functional categories

In defining the conjunct prefixes of Slave as functional categories, Rice (1990a) provides a number of characteristics for each conjunct prefix which define them as inflectional morphemes. The verbal suffixes of Ahtna share two of three defining properties of the conjugation morphemes. First, the choice of both the conjugation marker and the verbal suffix is determined by secondary (and primary) aspectual material. "Since they do not obey strict locality, a property of lexical operations, this suggests that they are inflectional, and thus syntactic, as syntactic operations can depend on material outside of their immediate domain" (Rice 1990a:17). Second, both the conjugation prefixes and the verbal suffixes are obligatory in Ahtna.[27] The verbal suffix does not share the third characteristic which defines the conjugation prefix as an inflectional morpheme, but this is easily explained: the verbal suffixes do not combine with adjacent inflectional morphemes to form portmanteau morphemes quite simply because they are not adjacent to other inflectional morphemes. In addition, the verbal suffixes share the canonical form of the conjunct prefixes (C) rather than that of the disjunct prefixes (CV(C)(V)). Thus, the verbal suffixes are like conjunct prefixes which have somewhat got behind, rather than in front of, the root.

4.2 Positioning the verbal suffix

One approach to positioning the verbal suffix in the verbal complex, that implied in the analyses of Speas and Rice, is to say that this functional category combines with the root in the lexicon to form the stem, which then in turn syntactically combines with the other functional categories. This is merely the same approach used in (5) for the verb complex as a whole, and it must be rejected for the same reason. Once the verbal suffix is combined with the root in the lexicon, it is no longer accessible to the syntax, and it becomes impossible to describe the co-occurrence relations of the verbal suffix with the mode and aspect prefixes in a principled manner.

There are various approaches which do allow the verbal suffix to be treated as a functional category, however. One approach might be to posit the position of the verbal suffix to be the inflectional category closest to the verb root at D-structure and have it adjoin to the root before movement occurs. This proposal is, however, problematic for the derivations presented. First, the rule seems rather ad hoc. More importantly, if Speas is correct in assuming that morphological subcategorization frames respect X-Bar theory, any lowering analysis would have the same problem as derivation (8) does. Furthermore, such a proposal would be in violation of the observed scopal properties of the verbal suffix. Since the verbal suffix is functionally equivalent to the conjugation marker (= Tense), which is said to have scope over secondary aspect (= Aspect), it too must have scope over secondary aspect and be placed above it.

An alternative might be to posit the verbal suffix as the highest functional category, which would give it scope over secondary aspect as desirable (and over the subject, not so desirable), and

have the root move into a position immediately preceding this morpheme. How this could be done in a principled manner is, however, not at all clear and could indeed be taken as an indication that this model is insufficiently restrictive.

A third alternative is to assume that the verbal suffix is located in a place appropriate to its scopal properties and is merely specified lexically to attach to the opposite side of the morpheme (cluster) being incorporated or to which it is incorporated as are the other functional categories. This would produce the desired results, but would not be allowed if morphological subcategorization frames obey X-Bar theory. Whether this is proper evidence that morphological subcategorization is subject to different conditions than syntactic subcategorization is perhaps a topic worthy of further study.

5.0 CONCLUSION

In this paper, the (innermost) verbal suffix in Ahtna, its forms, function, co-occurrence restrictions and its underlying position have been examined.

A detailed comparison of this suffix with what Kari (1990) claims to be the other verbal suffixes of Ahtna strongly suggests that this is indeed a true suffix, a suffix such as those characterized by Zwicky and Pullum (1983) as representing an inflectional category, while the other verbal "suffixes" are, in fact, merely enclitics.

It has been shown that in Ahtna, and perhaps other Athapaskan languages, this suffix, usually grouped together with the root to form the verbal stem, in fact represents a functional category closely correlating with, and restricted in its co-occurrence by, the conjugational/mode prefix and, to a lesser extent, the (secondary) aspect prefixes. Indeed, if the verbal suffix is taken to co-represent MOOD in the Athapaskan verb together with the mode prefix, a morphological universal can be shown to be satisfied by the Athapaskan languages. A difference in canonical form has been observed between the disjunct prefixes, claimed by Speas and Rice to be derivational morphemes appearing as proclitics, and the conjunct prefixes, claimed to be inflectional morphemes. It is surely not a coincidence that among the suffixes there is a similar difference in canonical form and suffixal status between the innermost suffix, having (like the conjunct prefixes) the canonical form C, and representing a functional category, and the other verbal enclitics of Ahtna which (like the disjunct prefixes) have the canonical form CV and represent lexical categories.

Given these observations, the proposals of Speas and Rice for a syntactic analysis of the Navajo and Slave verb complex, while in themselves very promising and certainly superior to the templatic model, are inadequate for a description of the Ahtna, since they do not accommodate a position for the functional category represented by the verbal suffix. A number of means for accommodating the presence of the verbal suffix as an independant functional category in Athapaskan can be proposed. The most promising of these has the verbal suffix placed within the string of conjunct affixes, which however would be disallowed if the same principles which apply in syntax are said to apply in morphology as well. Further study is required before a definite conclusion can be reached in this matter.

NOTES

1 Among the languages surveyed by Greenberg (Cutler, Hawkins & Gilligan 1985:728), one

made exclusive use of prefixes. This one language, however, was typologically very different from any Athapaskan language, having VO word order and prepositions.

2 It seems significant that Athapaskan languages do agree with the other of the two "exceptionless universals" of morphology proposed by Cutler, Hawkins and Gilligan and relevant to a discussion of Athapaskan, namely "(6) If a language has NP + Po or SOV, NOMINALIZING affixes on N (if any) are suffixed" (Cutler, Hawkins and Gilligan 1985:729).

3 There is some disagreement among Athapaskanists as to whether a suffix is present in all verb stems. Kari assumes that all Ahtna verbs have a suffix, but most other Athapaskanists seem to feel that while a suffix may be present, it is not obligatory in all cases. This will be discussed further in Section 2.

4 Kari (1989:443) notes that Ahtna dialects differ with respect to the order of zone 5 prefixes, resulting in Central, Western and Lower Ahtna having the form *hk'etnaan* 'they are drinking' corresponding to the Mentasta Ahtna form *k'qetnaan*.

5 Kari (1990:40), for example, notes with respect to Ahtna that "in two of fifteen relevant examples, the order of iterative and distributive is reversed", and Hargus (1988) shows that the iterative morpheme of Sekani may appear in any of three positions with respect to the distributive morpheme and an incorporated stem.

6 Rice's arguments for ordering the disjunct prefixes according to their scope at D-structure follow from the view of Athapaskan verb structure presented in Rice (1990a), which will be discussed in Section 3.

7 The vsf2 suffix leaves only voicing as evidence of its presence when followed by the vsf3 morpheme and the vsf3 morpheme *-(y)i* deletes when followed by the possessive suffix *-e'*, as in *tl'ogh t'aaze'* 'his scythe' (< tl'ogh t'aas+i+e'; cf. *tl'ogh t'aasi* 'scythe [literally: that which cuts grass]') (Kari 1990:669). Since these effects could be due to of a phonological rule, they will not be taken as evidence that the Ahtna vsf3 and vsf4 morphemes are anything other than typical clitics.

8 In Ahtna, the graphemes p, t, tl, ts, c and k represent aspirated voiceless stops and affricates, while b, d, dl, dz, g, and gg represent unaspirated voiceless stops and affricates. Syllable-final stops are always unaspirated although written as aspirated stops (Rice, p.c.), so the apparent change in the voicing/aspiration of a stop with the addition of the vocalic suffix *-e* is merely a illusion resulting from a syllable-final stop becoming syllable-initial. Nevertheless, the addition of vsf2 does induce a real phonetic change, voicing, in fricatives.

9 Glottalization prevents deaspiration of an aspirated stop/affricate followed by vsf2 as shown by examples such as *'ele yidzaek'e* 'he didn't caulk it' (Kari 1990:678). Glottalization does not, however, block the (deglottalization and) deaspiration of glottalized stops/affricates when they are followed by the possessive suffix, as can be seen by comparing the negative form *t'aats'e* (t'aats'+e) 'did not cut' with the relative possessed form *t'aadze'* (< t'aats'+(y)i+e') (Kari 1990:667-668). This difference might lie in the glottalization associated with the vowel of the possessive suffix; Ahtna may not allow two adjacent segments both to be glottalized.

10 Other factors also affect the phonological outcome of adding the vsf2 morpheme, but to dis-

cuss them would be beyond the scope of this paper. Fricatives, for example, are voiced before vsf2 only if also preceded by a long vowel, as can be seen by comparing *t'aaze* (< t'aas+e) 'was not cutting' with *t'ase* (< t'as+e) 'will not cut' (Kari 1990:667), the glottal stop (') is not affected by the addition of vsf2 and the n suffix disappears without trace when followed by vsf2.

11 Kari lists the form of this suffix as *-s*. However, since the word-final spirantization of an aspirated stop and the deaspiration of a voiceless stop intervocalically are both processes commonly observed, the underlying form of this morpheme is more likely *-k* (as proposed for Proto-Athapaskan in Leer 1979), rather than the *-s* < **-g* proposed by Kari (1990:447).

12 Unlike the deletion of vsf2 before vsf3 and vsf4, the voicing of an obstruent before vsf2 seems less likely to be the effect of an general phonological process; Ahtna has intervocalic voiceless/aspirated obstruents. There are, however, other contexts for voicing/deaspiration in Ahtna, such as preceding the possessive suffix *-e'*, as in *tl'uule'* 'his rope' (< tl'uuɬ + e') (Kari 1990:37). Also, Kari treats many stem-inital obstruents as voiced obstruents which "become voiceless when in word-initial position or when incorporated into the verb" (Kari 1990:36); presumably, these could also be treated as voiceless segments which become voiced in a variety of contexts.

13 Rice, who prefers the term "primary aspect", says (1990a:5) that "*mode* is a misnomer which is used for convenience in much of the recent Athapaskan literature", since "imperfective and perfective are aspectual rather than modal" (p.c.). While this is true, in contrast to future and optative, imperfective and perfective do represent a mode, the **indicative** mode.

14 Despite appearances, the phonetic value of this suffix has also remained unchanged. The grapheme *x* represents a uvular fricative in Ahtna, the rare (*x having mostly shifted to *s* in Ahtna) velar fricative being represented as *yh*.

15 The full range of processes used in the generation of a Ahtna verb is given in Kari's figure 2 (Kari 1990:39), of which figure (2) is here an abbreviated version.

16 Spencer (1991:213) suggests that "template morphology may be with us to stay", but he may not have been familiar with Speas' recent work as only her 1984 MITPWPL paper on Athapaskan verb morphology is listed in his bibliography.

17 Speas (1991) examines the nature of the Mirror Principle and shows with evidence from Navajo that the Mirror Principle follows from Incorporation Theory, but only if three general principles of Grammar are assumed, namely (Speas 1991:210): (a) All heads, functional and lexical, project minimality barriers for antecedent government of X^0 traces. (b) 'Excorporation' can only be from adjoined positions. (c) Projection of morphological subcategorization frames obeys X-Bar theory.

18 Although the disjunct prefixes may seem a very heterogeneous group, Rice (1990a:32) points out that what they have in common is the fact that each disjunct prefix can constitute a prosodic foot.

19 This morpheme is apparently cognate with the Navajo prefix *o*. It is interesting to note, however, that while this, the conative aspectual marker, occurs immediately preceding (most of)

the qualifier morphemes in Ahtna (Kari 1990:40/41) and Slave (Rice 1989:599-601), leading it to be grouped together with them, in Navajo this morpheme is grouped together with the mode prefixes of position 7 (Speas 1990:205).

20 In Navajo, the epenthetic vowel is *i*, while in Slave it is *e*.

21 While recognizing that Pollock (1989) quite explicitly stated that the scope order assumed for French and English was probably not universal, Speas (1991:185) feels that "Chomsky's work and subsequent investigations of diverse languages seem to be converging on an order that recurs in language after language."

22 Although the verbal classifier of Athapaskan is sometimes thought of as a voice marker, it has a number of other functions as well and combines idiocyncratically with verb roots to produce various bases. For this reason, it is perhaps best to assume that it is lexically derived and/or is not the same kind of object as the voice marker in other languages.

23 Rice (1990a) argues that the disjunct prefixes (in Navajo and Slave, but perhaps not Ahtna) can all be characterized as constituting a prosodic foot and have access to the full phonology of the language (conjunct prefixes are much more limited in their phonology). The disjunct prefixes each form a phonological unit distinct from the conjunct prefixes, in addition to being functionally distinct -- unlike the conjunct prefixes, which represent functional categories, the disjunct prefixes all seem to represent lexical categories -- as argued in Rice (1991), and are thus clearly more independent than the conjunct prefixes. Thus, while they are admittedly less independent than some other morphemes whose status as clitics is not questioned, there seems to be good reason to call them clitics.

24 In fact, in matching verbal categories represented in various languages with the categories of the universal hierarchy, Speas (1991:185) equates **mood**, which, as has been argued above, is what the mode prefixes primarily represent, with **aspect** (with respect to Basque).

25 Accepting Hale's view of Athapaskan languages as non-configurational is, however, problematic. First, a non-configurational language typically hat it has free word order, whereas all the Athapaskan languages have strict SOV word order; the non-configurationality analysis has no explanation for the rigid word order of Athapaskan. Second, Saxon (1986, 1989) has provided convincing evidence that at least Dogrib and Slave are configurational, since in these languages (a) pronominal inflection corresponding to each argument is not obligatory, (b) not all lexical NPs corresponding to arguments are optional, (c) lexical NP arguments do not behave like adjuncts for the purposes of extraction and (d) noun incorporation is possible. If Navajo can be shown to be configurational, it seems preferable to analyse all Athapaskan languages as configurational rather than claim that some languages of this family are configurational but not others.

26 Speas (1991:197) notes that the derivations in (8), (9) and (10) all violate a strict version of the Affix Consistency Constraint, as in all three derivations, O subcategorizes for VP but is not adjacent to V in the surface string. Speas, however, takes this not as evidence for the inadequacy of these representations, but as evidence "that the correct version of the Affix Consistency Constraint must be one which refers to some condition on the syntactic representation rather than to the surface string" (Speas 1991:197).

27 Since stem variation is used to define verbal conjugations in all Athapaskan languages, it might be said that in an abstract sense, the use of verbal suffixes is required in all Athapaskan languages. In all but the Alaskan Athapaskan languages, however, phonological modification of syllable codas has so thoroughly eroded all signs of the verbal suffixes, particularly with roots originally having a consonantal coda, there is little motivation for the positing of verbal suffixes with all verb forms in a synchronic analysis of the verb system.

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TOPIC-BOUND NULL PRONOUNS IN CHINESE

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1. INTRODUCTION

Chinese, Japanese, Thai and some other languages do not have verb agreement, and yet they allow subjects and objects to be null.[1] This challenges the generally accepted null subject parameter, what Jaeggli (1982) terms as the Identification Hypothesis. Many linguists have, over the years, tried to modify the Identification Hypothesis to accommodate the Chinese type of null pronouns and probed the possibility of fitting these null pronouns into Chomsky's (1977, 1981) EC theory. These efforts, however, have turned out to be not very successful. At stake has been the dual categorial properties (pronominal as well as variable) of the null pronouns in these languages. These null pronouns can: i. occur in syntactic islands, and ii. be either A-bound or A'-bound. This paper addresses the problems respectively.

The paper is organized in the following way. Section II discusses the problems with the previous efforts in modifying the Identification Hypothesis. Due attention will be directed to the A and and A'-bound possibilities of the null pronouns and the conclusion reached is: both null subjects and null objects can be bound by NP arguments in upper clauses. Section III starts out with a review of some traditional analysis of the topic construction and ends with the claim that topics in situ are allowed in Chinese type of languages and the A-binders of the null pronouns are actually topics in situ. Section IV lays out a discourse rule and a prominence hierarchy to account for the possible occurrences of topics in situ as well as the binding relation between topics and null pronouns. Section V reconsiders the complement/adjunct and the subject/object asymmetries in terms of the rule proposed in section IV. In section VI, questions are raised concerning Chomsky's (1981) functional definition of ECs and it is argued that Chinese null pronouns are not subject to syntactic constraints because they are licensed by a discourse rule as proposed in section IV. The last section is the conclusion of the whole paper.

2. PROBLEMS WITH THE PREVIOUS EFFORTS

To save the Identification Hypothesis, Raposo (1986) and Huang (1984, 1987, 1989, 1991) have shown that most null pronouns in Chinese type of languages are subject to binding condition C and so they should be better considered as variables, or traces left by wh-movement of a null operator to the SPEC of COMP position. If this is true, the unidentified null pronouns will not create any problems for the Identification Hypothesis, because variables are not subject to identification requirements.

2.1 Pronominal properties of the null pronouns and Huang's GRC

Yet things are not that easy. Null pronouns in these languages have pronominal properties. First, they can occur in syntactic islands (which I will talk later) and second, as Huang (1984, 1987) notices, they can be bound by argument NPs:

(1) Zhangsan$_i$ shuo e_i bu renshi Lisi.
Zhangsan say not know Lisi
'Zhangsan said that (he) didn't know Lisi.'
(Huang, 1984)

According to Chomsky's (1981) functional definition, an A-bound EC has to be a pronominal. To keep in line with Chomsky's definition of ECs and at the same time save the the Identification Hypothesis, Huang (1984, 1987, 1989) extends the identification requirements to include not only the rich agreement features but also an NP in a certain binding domain. This extension is expressed in his Generalized Control Rule: (Huang, 1989, p. 193)

(2) Generalized Control Rule (GCR)
An empty pronominal is controlled in its control domain (if it has one).

And the notion of a control domain is defined as follows:

(3) α is the control domain for β iff it is the minimal category that satisfies both (a) and (b):
a. α is the lowest S or NP that contains (i) β, or (ii) the minimal maximal category containing β (henceforth, MMC(β)).
b. α contains a SUBJECT accessible to β.

This GCR admits only three kinds of null categories as *pros*, i. null subjects and null objects identified by agreement morphology; ii. null subjects obligatorily bound by upper subjects; and iii. null subjects optionally bound by upper subjects. The first kind exists in Italian type of languages and the second/third kinds exist in Chinese type of languages as (4) and (5) illustrate:

(4) Zhangsan$_i$ ku de [e_i hen shangxin.]
Zhangsan cry till very sad
'Zhangsan cried till he got very tired.'
(Huang, 1989)

(5) Zhangsan$_i$ suo [$e_{i/j}$ kanjian le Lisi.]
Zhangsan say EC see ASP Lisi
'Zhangsan$_i$ said he$_{i/j}$ saw Lisi.'
(Huang, 1984)

The null subject in the resultative clause in (4) has two potential control domains, the embedded S which contains it and the matrix clause which contains its MMC. As the lower S has no accessible SUBJECT, it has to have the matrix clause as its control domain and there it is bound by the matrix subject. Sentence (5) is problematic for Huang. It seems to have the same structure as (4), yet the null subject in the complement clause can be bound either by the matrix subject or by a null topic already established in discourse. To solve this problem, Huang proposes different structures for sentential complementation:

(6) $[_S ... [_{VP} ... [_S pro ...]]]$

(7) $[_S ... [_{VP} ... [_{NP} [_S pro ...]]]]$

(6) is the structure for verbs like the one in (4). And (7) is the structure for verbs like the one in (5). A null subject in a structure like (6) has the matrix S as its control domain, whereas a null subject in a structure like (7) does not have a control domain, because neither of its two potential control domains, the lower S and the NP that minimally contains the lower S, contains an accessible SUBJECT. A *pro* that has no control domain will be free, and so it can have intrasentence references (a long-distance A-binder – the matrix subject), extrasentence references or even arbitrary references.

By GCR, a null object, no matter what clause it is in, has to have its local clause as its control domain, for there is always an accessible SUBJECT, either the subject NP or the AGR. It can be licensed by AGR features but it can never be bound by the subject NP because that constitutes a violation of the binding condition B. Therefore an unidentified null object can only be a variable bound by a topic, either null or overt.

This GCR seems to have two attractive features. First, it provides, without changing the Identification Hypothesis, an account for the A-bound null subjects in Chinese type of languages. And second, it makes an overall generalization of all unidentified null pronouns other than A-bound subject. (They are all A'-bound variables.) Yet the virtue of these two attractive features will be nullified if the A or A'-bound distinction between null subject and other unidentified null pronouns proves to be not existing.

2.2 The subject/object asymmetry

The A/A' binding distinction is shown by the subject/object asymmetry originally observed by Kuroda (1965) for Japanese. Huang observes the same for Chinese. In his 1984 paper, he illustrates this asymmetry in various constructions. And the most crucial data come from the sentential complementation construction:

(8) a. Zhangsan$_i$ xiwang $e_{i/j}$ keyi kanjian Lisi.
Zhangsan hope can see Lisi
'Zhangsan$_i$ hopes that [he$_i$] can see Lisi.'

b. Zhangsan$_i$ xiwang Lisi keyi kanjian $e_{*i/j}$.
Zhangsan hope Lisi can see
'Zhangsan$_i$ hopes that Lisi can see [him$_i$].'
(Huang, 1984)

According to Huang the contrast of (8a) and (8b) shows that a subject EC can be A-bound by the matrix subject and therefore a pronominal, whereas a object EC can only have its references fixed outside the sentence. and therefore a variable.

Xu (1986) provides counterexamples to argue against Huang's assumption:

(9) haizi$_i$ yiwei mama yao zeguai $e_{i/j}$ le.
Children think mother will blame ASP
'The children think that Mother will blame (them) now.'

(10) xiaotou$_i$ yiwei meiren kanjian $e_{i/j}$.
thief think nobody see
The thief thought that nobody saw (him).'
(Xu, 1986)

In both (9) and (10), the null object in the complement clause is bound by the matrix subject. I must admit that sentences with A-bound null objects are not as easy to come across as the ones with A-bound null subjects, yet the crucial problem here is why the counterexamples are possible at all. Are they syntactically possible? Or are they just specially constructed and pragmatically oriented cases? In the following subsections I will discuss data from both Chinese and other languages and argue that it is a syntactic possibility for null objects to be bound by upper arguments. And the asymmetry lies somewhere else.

2.3 Data from Other Languages

We will first look at the data provided by Cole (1987). Cole discusses examples from Imbabura Quechua and Korean and argues that these languages do allow A-bound null objects:

(11) Juzi$_i$ nin [Marya e_i juyanata].
Jose say Maria will love
'Jose says that Maria will love (him).'

(12) Juan$_i$ munan [Juzi e_i rijsichun].
Juan wants Jose know
'Juan wants Jose to know (him).'
(Cole, 1987, p.600)

Sentences in (11) and (12) show that the null objects can be bound by the matrix subjects and they do not require any special context to be acceptable. Cole provides unmarked cases of A-bound null objects from Korean and Thai too:

(13) Chelswu$_i$-ka [Yenghi-ka e_i hyeppakha-ess-ta] -ko cwucangha-ess-ta.
Chelswu-nom Yenghi-nom threaten-past-decl-comp claim-past-decl
'Chelswu claims that Yenghi threatened (him).' (Korean)

(14) Nit$_i$ b...k waa [Nuan hen e_i]
nit speak say Nuan see
Nit said that Nuan saw (her).' (Thai)
(Cole, 1987, p.603)

In Chung (1984), we see some interesting Chamorro data concerning the occurrence of null objects too. Chamorro is a language that has rich subject agreement features and the conditions governing the distribution of overt/null subject pronouns are consistent with the Identification Hypothesis. The problem with the Identification Hypothesis is the occurrences of null objects. Null objects in this language do not show any properties of variables, instead they display pronominal properties. They may be bound by upper clause arguments:

(15) Ha-hahässu ha' si Maria$_i$ [na in-bisita e_i
SUBJ3s-remember Emp Unm that SUBJ1p-visit

gi espitát].
Loc hospital

'Maria$_i$ remembers that (we) visited (her$_i$) at the hospital.'
(Chung, 1984, p.6)

According to Chung, sentences like the one in (15) with null objects in embedded complement clauses are grammatical for some speakers. And the following sentence with a null object in an adjunct clause is grammatical for all speakers.

(16) Man-mäguf i famagu'un$_i$ [sa' hu-ga'nu'i e_i ni gitala].
SUBJ(p)-happy the children because SUBJ(1s)-show Obl guitar
'The children were happy because I showed (them) the guitar.'
(Chung, 1984, p.6)

This complement/adjunct asymmetry is just the same as Hasegawa (1984/85) observes for Japanese. And this is an asymmetry which Huang's GRC can not explain. Chung also talks about cases where null objects are not allowed (her example (12)), but these cases are explained by some other independent mechanism in the language.[2]

2.4 Null objects in other kinds of structures in Chinese

In this subsubsection I will discuss more examples in which null objects are bound by higher arguments:[3]

(17) Zhangsan$_i$ bu xihuang biren piping e_i.
Zhangsan not like others criticize
'Zhangsan does not like others to criticize (him).'

(18) Lisi$_i$ xiangyao Zhangsan lai kanwang e_i.
Lisi want Zhangsan come see
'Lisi wants Zhangsan to come and see (him).'

And the complement/adjunct asymmetry exists in Chinese too. It is easier to have null objects occurring in adjunct clauses:

(19) Lisi$_i$ [zai women piping e_i yiqian] jiu rencuo le.
Lisi at we criticize before already admit wrong ASP
'Lisi realized his fault before we criticized (him).'

(20) Lisi$_i$ [yinwei bieren kanbuqi e_i er] shangxin.
Lisi because others despise sad
'Lisi felt sad because others despise (him).'

2.5 Summary

The above discussion has shown that both the null subject and the null object can have a binder in A position. And so the subject/object asymmetry can not be syntax-based. Once this is clear, Huang's GCR have to be given up. We have to find some other way to explain the distribution and reference of unidentified null pronouns in Chinese type of languages. In the following section I will turn to some traditional analysis of topic-comment construction in Chinese, which will give insight into our discussion of the null unidentified pronouns..

3. NEW APPROACH: TOPIC IN SITU

In this section I will first briefly review the traditional analysis of topic structures and then following Shi (1989) I will argue that NP arguments have the potential to become topics for lower clauses or subsequent sentences without moving overtly into the usual topic position.

3.1 Traditional analysis of topic structures

Traditionally the distinction between topic and subject has never been clear-cut in Chinese. Li & Thompson (1981) distinguish topics from subjects only when there are two NPs in the sentence initial position:

(21) Zhansan$_i$, Lisi kanjian e_i le.
Zhangsan, Lisi see ASP
'Zhangsan, Lisi saw (him).'

Zhangsan in (21) is the topic and *Lisi* is the subject of the sentence. And the empty object has the references of the topic. The subject might be identical with the topic, when there is only one NP in the sentence initial position:

(22) Wo xihuan chi pingguo.
I like eat apple
'I like to eat apples.'

Structurally the subject *wo* is the only NP in the sentence initial position. Phonetically it can be set off from the rest of the sentence by a pause. And semantically what follows it is a comment about it. All these are characteristic of a topic, so the subject *wo* is also a topic.

Tsao (1977) notes that a topic may extend its domain to a sequence of several sentences. Each sentence in this sequence is an independent comment of the topic. And he terms this sequence of

sentences as a topic chain. The following is an example of a topic chain given by Tsao (p.92): (ET here means empty topic)

(23) Neike shu, ET hua xiao, ET yezi da, ET hen nankan, ET wo mei mai *e*.
that tree flower small, leaves big, very ugly, I didn't buy
'As for that tree, the flowers are small, the leaves are big, (it's) very ugly, I didn't buy (it).'

Tsao claims that the initial NP of a topic chain is the topic of the first sentence and it can license the deletion of the topics of all other sentences in the chain. Li & Thompson develop this idea in a slightly different way. They argue that the topic of the first sentence is the topic of the whole chain and the gaps in the subsequent sentences all refer to this topic.[4]

3.2 Topics in argument positions

Both Tsao and Li & Thompson imagine an overt topic at the chain initial position. This kind of topic chain is recognized by Shi too. Shi also argues that the topic need not be an overt topic set apart from the comment sentences, it might be an NP occupying a certain position in the first link of the chain. According to him, an NP in the subject position, the object position and the specifier position[5] within the subject NP might serve as the topic of the following sentences. Following Shi I will assume that NPs need not occupy the topic position to function as topics. They may remain in situ and function as topics by passing their references vacuously down to the following sentences.

It is generally accepted that Chinese is a discourse oriented language, and topics play an important role. (Li & Thompson, Shi, Tsao, and Huang among others.) A topic is the core around which a discourse is organized. Unlike topics in languages like English and Italian, topics in Chinese type of languages can be both in situ and in the usual topic position (the specifier position of CP in GB).

3.3 A unified account of the null subjects and the null objects

As a consequence of admitting topics in situ, a unified account of unidentified null pronouns will be obtained. That is, all the unidentified null pronouns are topic-bound, with the topics either occupying the usual topic position or remaining in situ. And topics can pass vacuously down to the following sentences. The same is true for complex sentences containing complement or adjunct clauses. An argument NP in a matrix clause can pass vacuously down to the topic position of a subordinate clause. And like an overt topic in that position, it can bind either a null subject or a null object in the subordinate clause. The following sentences illustrate this:

(24) (A-bound null subject in complement clause)
Zhangsan$_i$ shuo ET$_i$ e_i bu renshi Lisi.
Zhangsan say not know Lisi
'Zhangsan said that (he) didn't know Lisi.'
(Huang, 1984)

(25) (A-bound null object in complement clause)
xiaotou$_i$ yiwei ET$_i$ meiren kanjian e_i.
thief think nobody see
The thief thought that nobody saw (him).'
(Xu, 1986)

(26) (A-bound null subject in adjunct clause)
John$_i$-ga ET$_i$ [e_i Mary-o naguru mar-ni] naiteita
John-nom Mary-acc hit before was crying
'John was crying before (he) hit Mary.'

(27) (A-bound null object in adjunct clause)
John$_i$-ga ET$_i$ [Mary-ga $e_{i/*j}$ naguru mae-ni] naiteita
'John was crying before Mary hit him.'
(Hasegawa, 1984/85)

No matter a null pronoun is in the subject or the object position of a subordinate clause it can be bound by a empty topic (ET) which has the references of an argument in the upper clause. In other words the A-bound null pronouns are all actually topic-bound. And this point is strengthened by the fact that no null pronouns can be bound by an argument in its local clause, because an NP argument can never pass up to its local topic position and bind its co-argument.

3.4 Summary

The above analysis provides a unified account to all the unidentified null pronouns so that we do not have to suffer the awkwardness of splitting them up into two groups. The A and A'-bound difference is eliminated by a distinction between topics in topic positions and topics in situ. Following Huang (1984) I distinguish languages that allow null topics and languages that allow only overt topics. And the topics in situ proposed here further distinguish languages that allow topics in situ from languages that do not allow topics in situ. Chinese, Japanese and Thai are languages that allow all three kinds of topics and that is where we find null subjects and null objects which can be A-bound (bound by topics in situ), A'-bound (bound by topics in topic position) and unbound (bound by null topics).

4. LICENSING REQUIREMENTS FOR TOPICS IN SITU

Following Shi, I have assumed that some NPs have the potential to become topics in situ. As Shi observed, not all NPs have this potential. He recognizes only three positions which can host possible topics in situ: the subject position, the object position and the specifier position within a subject NP. For reasons I mentioned in footnote 4, I will focus on topics in subject and object positions only.

4.1 Topics in subject positions

It is quite easy for an NP in subject position to become a topic for lower clauses or subsequent sentences. Here we have more examples to further strengthen this point:

(28) Zhangsan$_i$ [zai e_i binghao zhiqian] buhui huilai.
Zhangsan at recover before won't come back
'Zhangsan won't come back before (he) recovers.'

In (28), the subject NP binds the EC in the subject position of an adverbial clause. In the following sentence the subject NP *Zhangsan* binds gaps in the subject positions of a series of sentences:

(29) Zhangsan$_i$ gongzuo hen nuli,
Zhangsan work very hard

zuochu le henda gongxian,
make ASP very big contribution

suoyi bei jinshen wei jinli le.
therefore PASS promote as manager ASP

'Zhangsan works very hard, (he) has made great contribuation,
so (he) has being promoted to be the manager.'

It might be argued that the gaps in the above sentences are just traces of coordination deletion. Yet there are a few facts which make me believe that it is better to consider them as empty categories bound by the topic – the subject in the first link.

The first fact to consider is that the topic subject may extend its scope endlessly to however many subsequent sentences as long as there is no other potential topic intervening. And the subse-

quent sentences might be complex sentences containing matrix clauses and complement, adverbial, relative, or conditional clauses. Let us look at a long sequence of sentences taken from a Chinese magazine:

(30) Tamen$_i$ dayixiegong, dan jin dao qian gou yong bianzhi;
they work a bit but only to money enough then stop

qiyushijian e_i bian gan xie [ziji xiang gan t_j]de shi$_j$].
othertime then do some self want do DE thing

Ran ji e_i gan shi, e_i ye yipai shuiyieran,
even if do sth a attitude carefree

e_i xiang gan ze e_i gan, e_i bu xiang gan ze e_i bu gan.
want do then do not want do then not do

Guoqu nazhong kuangwang de jingtou danranwucuen.
past that kind arrogance DE attitude disappear

Dui chuchenguo gen e_i yifu keyou kewu de taidu.
for achievements also a may may not DE attitude

They work a bit, but only to make enough money for a living. At other times, (they) do whatever (they) want to do. Even if (they) do something, (they) have a carefree attitude. When (they) want to do it, (they) do; when (they) do not want to then (they) will not. (Their) past arrogance disappeared totally. As for achievements, (they) do not mind at all.

The first sentence is a conjunctive sentence. And the second sentence contain three sets of subjunctive sentences. And the third and fourth sentences are just simple sentences. One thing common to all these sentences is that they all have a null subject which has the references of the subject of the first link.

The second crucial fact to consider is that some of the subsequent sentences may be gapless. It is a complete sentence in its own and a comment about the topic. Obviously no deletion of any kind can be involved in such kind of cases:

(31)	LaoZhang$_i$	shiye	le.	e_i	Zhengtian	zai	jiali	fachou.
	Old Zhang	lose job	ASP		all day long	at	home	worry
	Toufa	dou	chou-bai	le.				
	hair	already	worry-white	ASP				

'Old Zhang lost his job. He is worrying at home all day long. The hair is worried to white already.'

The third sentence contains no gap. It is just a comment about the subject in the first link: *Lao Zhang*. The relation between this sentence and the topic in situ is just like the one between gapless comments and the topic in the topic position as shown in (23). The only difference between (23) and (31) is that the former has a topic in the topic position while the latter has a topic in situ. Therefore it is natural to argue that the third sentence in (31) is possible just because there is, in its topic position, an empty topic that has been passed down from the first link of this chain. That is the way how a gapless sentence gets related to the subject of the first link of the chain.

As said before, Chinese is a topic-prominent language. And in Chinese, a subject has prominent status in discourse and can always function as a topic. When a subject binds the null subjects of the subsequent sentences, the prominence of the subject is kept from sentence to sentence and so the topic chain can go on forever theoretically. And that is born out by topic chains like the one in (30). To accommodate this fact, we tentatively propose a Prominence Continuance Rule:

(32) A topic is the most prominent semantic item in discourse. And as long as a topic, either an overt/null one or one in situ, bounds a gap in the subject position of a lower clause or a subsequent sentence, the prominence of the topic is maintained and so this topic qualifies to pass further down (vacuously) to the topic positions of the following sentences.

Cases where the subject of the first link binds a null object in the subsequent sentence are also possible:

(33)	Zhezhiji$_i$	xiadan	duo,	dajia	dou	xihuan $_i$
	this hen	lay eggs	many	people	all	like

'This hen lays a lot of eggs, people all like (it).'

(34)	Zhansan$_i$	bingle,	jialiren$_j$	bu	nen	zhaogu e_i,
	Zhangsan	sick	family	not	can	look after
	e_j	zhihao	zhao	le	ge	baomu.
		had to	find	ASP	a	nurse

'Zhansan is sick, (his) family can't look after (him), (they) have to find a nurse.'

And the interesting thing here is: if a topic binds an object, the chain will stop. And the intervening subject might start a new chain, as the second and the third links in (34) show. And that is in line with our Prominence Continuance Rule. A object position is not a prominent position. When a topic binds an EC in the object position, the prominence of the topic is no longer maintained and the chain of prominence is broken, hence the termination of the topic chain.

4.2 Topics in object positions

Now let us turn to possible topics in the object position.[6] We notice that objects do not usually pass down their references as topics:

(35) *Zhangsan dashangle Lisi$_i$, e_i bei songjin yiyuan qu le.
Zhangsan wound Lisi was sent-in hospital go ASP
'Zhangsan wounded Lisi, (Lisi) was sent to the hospital.'

The null pronoun in (35) can not refer to the matrix object. However, if the object is some new information the speaker means to introduce into the discourse, it might become a topic and pass its references down to the following sentence. This is because an introduction of something new is actually an introduction of a new topic. And so this kind of object is supposed to be prominent and has the potential to become a topic.

(36) Wo zuotian maile **yiben shu$_i$**, e hen youyisi,
I yesterday buy a book very interesting

wo yizhi kan e_i dao banye cai shuijiao.
I all along read till midnight then went to bed.

'I bought a book yesterday. (It) is very interesting. I read (it) until midnight, then went to bed.'

Although *yiben shu* is in the object position of the first link in (36), it is the new information that is introduced into the discourse and so it has the potential to turn into a topic. And we further notice that a descriptive sentence commenting on certain properties of the newly-introduced object may help establish the topic status of an object. This is true for (36). Even the ungrammatical sentence in (35) will improve dramatically if we add in a descriptive sentence:

(37) ? Zhangsan dashangle $Lisi_i$, e_i shandde hen zhong,
Zhangsan wound Lisi wound very serious

e_i bei songjin yiyuan qu le.
was send-in hospital go ASP

'Zhangsan wounded Lisi. (Lisi) was very seriously wounded.
(He) was sent to the hospital.'

It seems that the descriptive sentence functions to strengthen the topic status of the object in the first link and then the topic might continue on like a usual topic. In other words, once it is established as a topic, it might pass down as long as its prominence is maintained. To capture these facts we propose an Prominence Hierarchy to supplement the Prominence Continuance Rule:

(38) PROMINENCE HIERARCHY (preliminary)
a. A subject is more prominent than an object, and a subject is always a potential topic in situ by default.
b. An object can compete in prominence with a subject when it is some important information newly introduced into the discourse and its topic status is established by a descriptive comment sentence or some other way (a topic marker especially which I will talk about soon).

4.3 Summary

We have seen that NPs in both the subject position and the object position have the potential to become topics for lower clauses or subsequent sentences. And whether an argument NP can function as a topic largely depends on the degree of its prominence. And the Prominence Continuance Rule together with the Prominence Hierarchy proposed here predicts the possible commencement or termination of a topic chain.

5. A LOOK AT THE COMPLEMENT/ADJUNCT AND THE SUBJECT/OBJECT ASYMMETRY AGAIN

In the above section, I have argued that it is syntactically possible for both null subjects and null objects to be bound by a higher argument. Then what will account for the complement/adjunct and the subject/object asymmetry discussed in section II.2/3/4. Actually the discourse rule proposed in last section has provided us with a new perspective to look at these asymmetries.

5.1 The subject/object asymmetry

Let us have a look at the data (8a, b) concerning subject/object asymmetry again. In (8a), the empty subject of the complement sentence can be bound by its upper subject. We may assume that

the matrix subject is a potential topic and it can pass vacuously down to the topic position of the complement clause and bind a null pronoun there. According to our theory, a null pronoun both in the subject position and in the object position of a lower clause can be bound by the potential topic–the matrix subject. And we have discussed data from different languages to show that it is syntactically possible for null objects to be bound by matrix subjects. (See section II.3/4.) Yet we do admit that it is easier for null subjects of complement clauses to be bound by the matrix subjects than it is for null object. And there do exist cases like (8b) in which the null object can not have the references of the matrix subject. But as I have argued the asymmetry does not lie in the syntactical structure of the sentences. In the following we offer a new account of the asymmetry.

Let's look at the sentence by Xu (1986) again:

(39) xiaotou$_i$ yiwei meiren kanjian $e_{i/j}$.
thief think nobody see
The thief thought that nobody saw (him).'
(Xu, 1986)

Compare (39) and (8a) and we can see that both the null subject and the null object in complement clauses can have two interpretations, one with the subject in situ as an antecedent and the other with an null, discourse topic as an antecedent. And if a reading with an intrasentential antecedent (the matrix subject) is possible or preferable largely depends on the relationship between the matrix subject and the subevent expressed by the subordinate clause.

We have suggested that a topic is prominent and its prominence can be maintained only when it binds the most prominent argument – the subject – of a sentence or a lower clause. If a topic binds a null object, the chain of prominence will end. And the intervening subject will be a potential topic to start another topic chain. (See (34)) If there is an already established topic, either overt or null, the topic takes precedence over the matrix subject in passing further down as a topic. Compare (40) with (8):

(40) a. Wangwu$_j$, Zhangsan$_i$ xiwang $e_{*i/j}$ keyi kanjian Lisi.
Zhangsan hope can see Lisi
'Wangwu, Zhangsan hopes that (he) can see Lisi.'

b. Wnagwu$_j$, Zhangsan$_i$ xiwang Lisi keyi kanjian $e_{*i/j}$.
Zhangsan hope Lisi can see
'Wangwu, Zhangsan hopes that Lisi can see (him).'
(Huang, 1984)

In both sentences above the null pronouns have to be bound by the overt topic. The presence

of the established topics deprive the subjects of their chance to turn into topics. And the subject/object asymmetry is no longer there. If there is no established topic, the subjects can still have the potential to become topics.

Here it is time to give our final version of the Prominence Hierarchy:

(41) PROMINENCE HIERARCHY (final)
a. An established topic is more prominent than a subject.
b. A subject is more prominent than an object, and so a subject is always a potential topic in situ by default.
c. An object can compete in prominence with a subject when it is some important information newly introduced into the discourse and its topic status is established by a descriptive comment sentence or some other way.

The matrix subject can function as a topic for the subordinate clause and the subject of the subordinate clause can function as a topic for possible subsequent sentences. If the subordinate clause contains a null subject this null subject can easily be bound by the matrix subject, just like what we see in sentence (8a). Things are different for (8b) though. The subordinate clause in (8b) contains a null object. And between the matrix subject and the null object there is an intervening subject – the subject of the subordinate clause. As I said before this subject is a possible topic too and its presence kind of overshadows the prominence of the matrix subject and so the matrix subject, not established yet as a topic in any other way, has some difficult in becoming the topic for its subordinate clause. If the topic status of the matrix subject is otherwise established, then it will be easier for the null object of the subordinate clause to get bound by it:

(42) *Laozhang$_i$ yiwei [dajia duo xihuan e_i].
Old Zhang think people all like
'Old Zhang thinks people all like (him).'

(43) ? Lao Zhang a, yiwei [dajia duo xihuan e_i].
Old Zhang Ah think people all like
so everyone all like
'Old Zhang Ah thinks people all like (him).'

Sentence (42) is out, but sentence (43) is much better. And the only difference between them is that the topic status of the NP *Lao Zhang* is somehow established in (43) by *a* which has no meaning in itself and functions as a sort of topic marker in Chinese. Therefore we argue that the intervening subject might make the listener expect a change of topic and so the null object is not so easy to go across it to look for an antecedent. But if the possible antecedent is already an established topic in someway then the binding is easier.

Our assumption is supported by data discussed by Chung too. Chung's (12) is ungrammatical,

yet it will improve dramatically if the embedded subject is not overt. In other words, if the intervening subject is null it will not overshadow the prominence of the matrix subject.

Following these facts we might assume whether a matrix subject can bind an object in the complement clause depends on the prominence status of the matrix subject in comparison with that of the subject of the lower clause. By our Prominence Hierarchy, a later subject is as prominent as a former one. So it is difficult for a subject to bind across a later subject. But if a matrix subject is somehow established (by a comment sentence or a topic marker) it can bind across a later subject. And sometimes pragmatic factors might lay more stress on the matrix subject, and so it becomes more prominent than the intervening subject and have a chance to become a topic binding across the intervening subject.

In Chinese, we find it easier for the subjects of verbs like *xiangxin* 'believe' and *xiang* 'think' to bind the objects in their complement clauses. While it is harder for the subjects of verbs like *shuo* 'say', *xiwang* 'hope' to bind the objects of their complement clauses.

(44) xiaotou$_i$ **yiwei** meiren kanjian $e_{i/j}$.
thief **think** nobody see
The thief thought that nobody saw (him).'
(Xu, 1986)

(45). Zhangsan$_i$ xiwang Lisi keyi kanjian $e_{*i/j}$.
Zhangsan hope Lisi can see
'Zhangsan$_i$ hopes that Lisi can see (him).'
(Huang, 1984)

The reason might be that the subevents expressed by the complement clauses under 'say' kind of verbs receive more stress and so the prominence of the lower subject is not easy to be overshadowed by other factors. As for the 'think', 'believe' kind of the verbs, on the other hand, the subjects who 'think' or 'believe' receive a lot of stress and so they might overshadow the prominence of the subjects in their complement clauses.

To sum up, subject/object asymmetry does exists, but it has nothing to do with syntax. Some discourse factors, like the prominence of the topic and subject, the intervening subject effect and so on account for the asymmetry.

5.2 The complement/adjunct asymmetry

Our comparative prominence theory gives a natural explanation to the complement/adjunct asymmetry. A complement clause is subcategorized for by the matrix verb, while an adjunct clause is only optional. An adjunct clause only supplies additional information and can not serve as the core of discourse. Usually the subject of an adjunct clause does not have the potential to become

a topic, so it is easy for a matrix subject to bind across a subject of an adjunct clause.

6. THE SYNTACTIC STATUS OF THE TOPIC-BOUND NULL PRONOUNS

We have argued that both the null subjects and the null objects in Chinese type of languages are topic-bound. They are, therefore, all variables by Chomsky's definition. But there seems to exist another difference between the Chinese type of languages and the English, Italian type of languages. In English, Italian type of languages, the topic-bound variables are subject to island constraints or subjacency while in Chinese type of languages the topic-bound variables are not subject to the island constraints or subjacency. In the following we will see data from Chinese, Thai and Imbabura Quechua:

(46) (Null object in relative clause)

Juan$_i$	yuyan	[chay	[e_j	pay-ta$_i$/e_i	rijsisihka]	runa$_j$]
Juan	thinks	that		he-acc	knew	man-acc

mirkadu-pi kashka-ta.
market-in was-acc

'Juan thinks that the man who knows (him) was in the market.'
(Cole, 1987)

(47) (Null object in conjoined NP)

Juan$_i$	yuyan	chay	runa	pay-ta$_i$/e_i	Maria-wan	rikushka-ta.
Juan	thinks	that	man	he-acc	Mary-and	saw

'Juan thinks that man saw (him) and Mary.'
(Cole, 1987)

(48) (Null object in sentential subject)

Zhege	wenti$_i$	hen	nan,	[rang	ni	huida	e_i]	bu	gongping.
this	question	very	difficult	let	you	answer		not	fair

'This question is very difficult. To let you answer (it) is not fair.'

To explain the non-existence of subjacency effect in Chinese, Huang suggests that the null objects are generated as pronominals and then change into variables when they get bound by the topics. Yet as Huang himself realizes 'it may be that ECs are never allowed to change status in the course of derivation.' If this change of status is not a possible account for the special properties of the topic-bound null pronouns, then Chomsky's functional definition might be called into question.

We have seen that a null object can never be bound by its local subject. We have also proved that both null subjects and null objects in Chinese type of languages are topic-bound. All this seems to suggest that null pronouns in these languages are not pronominal in nature. Yet on the other hand, they do not behave like traces left by *wh*-movement or topic-movement in English type of languages in that they do not obey constraints on movement. In other words, the null pronouns in Chinese type of languages have both the pronominal and the variable properties.

In face of this problem, what we have to do is, maybe, give up Chomsky's functional definition as Huang suggests (1991, footnote 1) and assume that there are A'-bound pronominals. And our analysis of topics in situ seems to have provided a new perspective to look at the problem. Firstly, the possibility of topics in situ implies that no movement on the side of the null pronoun can be involved. It is the topic that moves vacuously down to the topic position of the subsequent sentences. Secondly the binding relation between a topic and a null pronoun is licensed by pragmatic and discourse rules rather by syntactic rules. So it is natural for us to imagine that the vacuous passing down of the topic does not happen in the syntactic component of the grammar and is not subject to syntactic constraints.

7. CONCLUSION

In this paper we present an analysis of null pronouns in Chinese type of languages. We have argued that both the null subjects and the null objects in these languages are topic-bound. The A /A'-bound difference is recasted as a difference between topics in topic positions and topics in situ. This analysis has a few interesting features. First, it provides a unified account for null pronouns which are not licensed by agreement morphology or clitics. Second, the possibility of topics in situ and the vacuous movement of topics gives a reasonable account for the pronominal features of the topic-bound null pronouns. And third, a typological distinction is made between languages that allow topics in situ and languages which don't allow topics in situ.

NOTES

1. Following Whitman (1986), I will call these null subjects and null objects 'unidentified null pronouns' in the sense that they are not identified by agreement or clitics.

2. Whitman (1986) discusses A-bound null objects too. He provides a VP ellipsis analysis for the identity of object ECs. Huang (1991) also talks about the possibility of analysing some of the object ECs as the results of VP ellipsis. Yet, VP ellipsis accounts only for a subset of possible null objects. The examples given in this subsection and the following subsection either have the null objects in adjunct clauses or have them c-commanded by their antecedents, so they can not be traces of VP ellipsis.

3. *'xihuan'* is control verb like the English 'want' and 'like'. A sentence like the one in (17) has the structure:

   [Xiaomin xihuan beiren [PRO piping e]].

4. Note that in (23) the sentences following the first one are actually gapless. What is missing is only the topic.

5. Some of Shi's data sentences, especially the one concerning topic in the specifier of the subject NP position, might involve coordination deletion. I leave these sentences aside to avoid possible controversy. I will discuss here only the sentences that apparently do not involve coordination deletion or VP deletion.

6. Following Huang (1991), we consider the null object in sentences like the following as VP deletion:

Zhangsan	aishangle	neige	guliang$_i$, Lisi	ye	aishangle	e_i.
Zhangsan	love	that	girl	Lisi	also	love

'Zhangsan loves that girl, Lisi does too.'

The cases we consider in the paper are not VP deletions.

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