

SYNTAX AND WORD FORMATION

by

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ABSTRACT

This dissertation concerns the morphophonological alternation of lexical items, determined by syntactic position. It considers three types of inflection, positional allomorphy and certain examples of phenomena collectively called "contraction", and argues that the notion of lexical insertion into d-structure, underlying many current syntactic theories, has difficulty in accounting for these cases. The difficulty is that the variation of forms for particular syntactic contexts is often a reflection of certain post-d-structure syntactic operations, such as move- α . Lexical insertion into d-structure occurs too early to be able to consistently insert the proper alternate for a given construction.

I argue that the lexical insertion concept conflates two independent processes: the projection from the lexicon of the categorial information composing the phrase structure of the sentence, and the phonological realization of the lexical items constituting the sentence. I propose a model of grammar incorporating the Government-Binding syntactic framework combined with the Lexical Phonology model of the lexicon. This model replaces the traditional notion of lexical insertion with the processes of Categorial Construction and Phonological Insertion. Phonological Insertion occurs after s-structure, i.e., after the syntax has completed its rearrangement of the base structure. In this way, the appropriate members of phonologically alternating items can be identified for a given syntactic context.

I also introduce two types of "incorporation" processes within the grammar. Merger occurs at s-structure, combining the grammatical features of two independent lexical items into a single composite set of features. Merger underlies the inflection phenomena studied here. Fusion takes place at PF and has access to both the grammatical and the phonological features of the words it affects. Fusion is responsible for the contraction data examined. Both processes explain the alternation of strings of items in one context with single items in another context by deriving the "incorporated" form from the base-generated string.

The model of grammar combining merger and fusion, along the Categorial Construction and Phonological Insertion, accomodates the alternation data in a natural way.

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CHAPTER ONE: INTRODUCTION

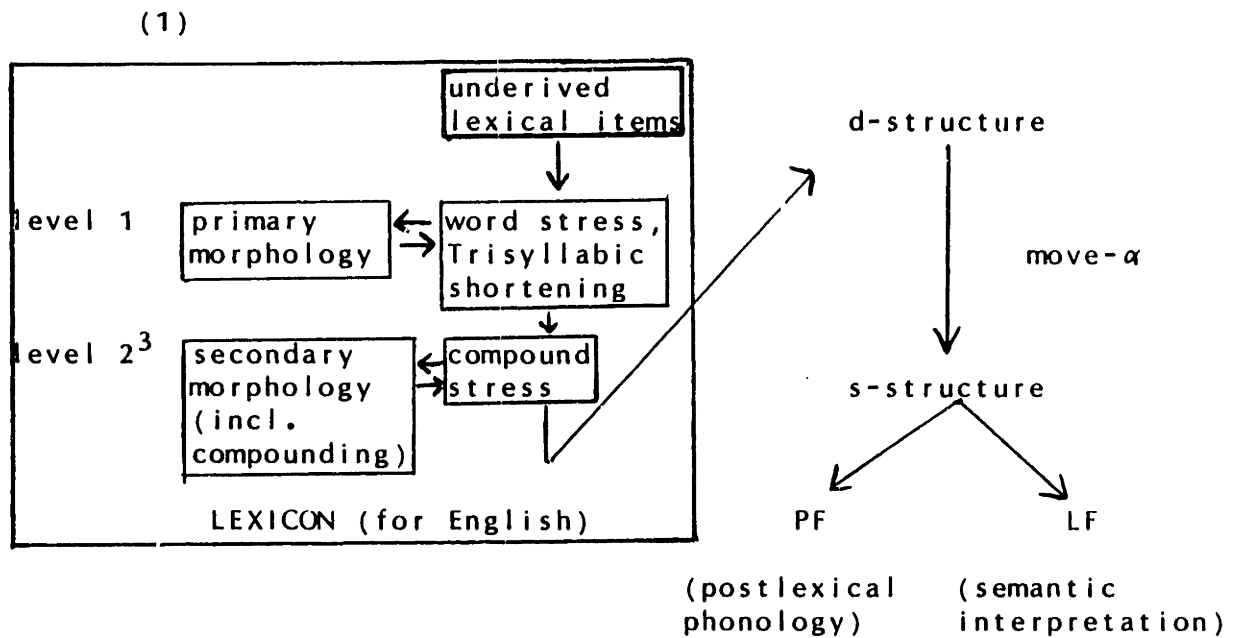
1. Introduction. This dissertation explores several instances of morphophonological alternation, between words or strings of words, in which the alternation is conditioned by the syntactic position of the words in question. My premise is that the morphophonological realization of some sentential constituents is a direct reflection of the syntactic operations like move- α which may alter the base-generated syntactic string in significant ways. For example, a constituent generated at d-structure in medial position, but optionally fronted to initial position by a particular syntactic rule, may exhibit variation in morphological shape based on whether that syntactic rule applies in a given sentence. I assume that these kinds of syntactic processes deform the original phrase structure, rendering s-structure.

I argue that the traditional notion of lexical insertion, generally conceived to introduce lexical items into phrase structures at the start of the syntactic processes, cannot adequately account for the type of morphophonological variation mentioned above. The difficulty is that it proposes to insert into the d-structure of the sentence items whose proper form cannot be determined until after possible syntactic movements (like move- α) have generated syntactic contexts designating a particular morphophonological shape. In short, lexical insertion into d-structure inserts lexical items too early in the derivation to allow for variants whose context is determined after d-structure gives rise to s-structure. I propose instead a model of grammar which avoids this difficulty by

delaying the introduction of phonological information into the sentence until after the syntactic processes have occurred, thereby identifying the appropriate positional variant.

I will briefly discuss this model of the grammar in the remainder of this chapter. I will support my proposal in subsequent chapters by showing how it accounts for three distinct sets of data which pose problems for the traditional notion of lexical insertion. I introduce two kinds of "incorporation" processes within the grammar: the syntactic process "merger", which effects certain kinds of inflection, as seen in Chapter 2, and "fusion", which subsumes a number of processes often referred to as "contraction", as examined in Chapter 4. These processes, I will argue, fit naturally into the model of grammar which I will assume: a modified version of the grammar combining the Government-Binding framework¹ (hereafter, GB) and the Lexical Phonology² model of word formation.

1.1 Lexical insertion. Consider the theory of grammar that combines a GB-view of the overall organization of the various components of the grammar together with a lexicon developed as in the Lexical Phonology model. Such a model is sketched below.



The GB and Lexical Phonology models are compatible. The morphological and phonological processes in the lexicon apply at each of several discrete levels which constitute the domains of the various processes; the output of the word formation component, i.e., lexical items, is sent to the syntactic component. The syntactic structures are generated by the base rules, and receive lexical items as the terminal elements in phrasal markers.

The process that unites the Lexical Phonology and GB models is lexical insertion, whereby the lexical items produced in the lexicon are inserted into the phrase markers. I cite Chomsky (1981): "Base rules generate D-structures through insertion of lexical items into structures generated by [the categorial component] . . ." (p.5). As stated there, and also implicit in the Lexical Phonology model as formulated e.g., in Kiparsky (1982a,b), lexical insertion is understood to occur at d-structure. That is, the operation of lexical insertion positions

lexical items as the terminal elements in the d-structure "stage" of the syntactic development of the sentence.

Suppose there exist phenomena in natural language which exhibit variations in phonological shape as a result of syntactic environments which are determined by the move- α processes in the syntax. Suppose further that such phenomena are clearly outside the class of variations expressed by regular post-lexical phonological rules, e.g., suppletion, alternating between two quite distinct forms which on the Lexical Phonology model would be related by principles which are clearly lexical in nature. As an even more dramatic example, suppose that two separate lexical items in one syntactic environment alternate with a single "merged form" lexical item in another syntactic environment. How does the model in (1) treat such situations? Specifically, how can lexical insertion, which inserts a lexical item into the d-structure of a sentence, that is, before a derived syntactic environment may arise as a result of move- α , insert a lexical item restricted to the derived context?

One instance of such phonological variation due to syntactic position is the special "pausal form" ⁴ in Hopi. Any consonant-final sentential constituent postposed to the right of the usually sentence-final verb appears in a special form.⁵ This pausal form is generally, but not exhaustively, a vowel which can be reconstructed from an earlier stage of Uto-Aztecan, but is not always justified synchronically. For example, the participial form of the verb meaning "to arrive, sg." is pitt-q 'upon arriving:OBVIATIVE' when it appears in a dependent clause preceding the main clause. When the dependent clause is extraposed to the right

of the main clause, however, the same participial has the form pitt-q'ö, where glottalization as well as the addition of the vowel indicate the pausal form. Such alternation cannot be handled as a general post-lexical phonological rule.

In fact, many cases of the phenomena described above -- i.e., various kinds of phonological alternation reflecting syntactic position -- occur in natural languages. Question word allomorphy in Papago, verbal and prepositional inflection for person in Irish, and certain kinds of "contractions" such as prepositional-article fusion in Spanish, all exhibit phonological variation as a function of syntactic position. The question posed above, regarding the treatment of such phenomena in the model outlined in (1), takes on significance as we begin to explore these examples.

One of the ways in which (1) can account for morphophonological variation based on syntactic position is by a filter, or set of filters, which screens out contextual violations. Another possibility is to allow recursion to the lexicon to "exchange" lexical items as new syntactic positions dictate a new lexical (phonological) form for the item in question. Still another way to handle the data is to modify (1) so that lexical insertion takes place at s-structure or PF, i.e., after the syntax is finished rearranging constituents. Then the appropriate context for the item will be established before insertion takes place.

The modified version of (1) which I will propose incorporates all of the foregoing alternative accounts of morphophonological variation in some form. However, no one of these possibilities is taken to exhaustively account for the

data. The contextual specifications associated with certain phonological strings, which I will suggest distinguish positional allomorphs like the Papago question word alternants in Chapter 3, are in a sense filters which reject sentences which do not meet the specified contexts. The model also makes use of a process of "merger" which is similar in spirit to a limited kind of recursion into the lexicon. This operation of merger exploits the well-recognized distinction between the grammatical features and the phonological matrices paired in each lexical entry of the lexicon. "Recursion", in terms of the merger proposal articulated in Chapter 2, consists in forming composite grammatical feature bundles from the feature bundles separately generated in a d-structure. Once the composite bundle is created, a phonological form distinct from the phonological form of the original two bundles is available from the lexicon. Finally, the suggestion of lexical insertion at PF is a notational variant of the actual insertion process (called "phonological insertion") adopted here.

I maintain that the notion of lexical insertion as it is conceived in such a model as (1) cannot account for the syntactically-influenced variation in the phonological forms of certain lexical items. I will instead develop an alternative model of grammar which continues to incorporate the basic GB/Lexical Phonology model, but redefines the notion of lexical insertion. I will then contrast this new model, which I will call the "merger model" with a similar proposal by Anderson (1982). I will reserve detailed discussion of the specific aspects of the merger model treatment of syntactically-influenced phonological alternation for the later chapters of this work.

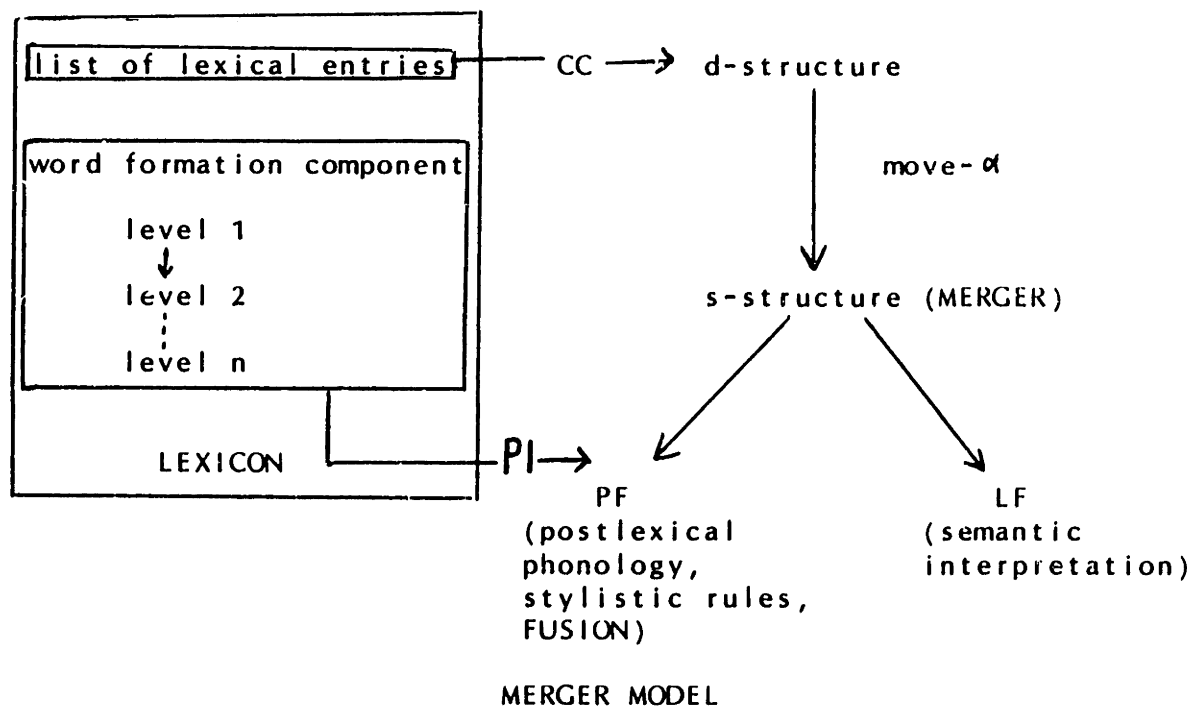
1.2 The merger model. Following Chomsky (1965) and the general tradition since then, I view the lexicon as a list of lexical entries defining the lexical items of a language. Each entry is composed of a grammatical feature bundle (hereafter 'gf-bundle') paired with one or more phonological matrices which instantiate that gf-bundle in various syntactic contexts, together with the "meaning" of the individual item. The gf-bundle includes categorial information, along with other information such as argument structure, subcategorization features, inherent features of person, gender and number, etc., about this lexical item. The phonological matrix is conceptually distinct from the gf-bundle. The former defines the phonological shape of a lexical item, while the latter defines its grammatical categories.⁶

In addition to the lexical entries, the lexicon contains the word formation component of the grammar. Word formation processes of affixation and compounding are responsible for the production of words from the lexical items upon which these processes operate. I assume here Kiparsky's (1982) conception of Lexical Phonology as a model for the word formation component. This model contains a multi-level sequence of morphological processes followed at each level by phonological rules which apply within the domain defined by these morphological processes. Both inflectional morphology and derivational morphology occur in this component, and both types of morphology are affected by the cyclic phonological rules applicable to specific morphological levels. The product of each level of word formation is a lexical item. I will assume further that the output of the lexicon are "words", where 'word' is understood to be a product of the (lexical)

word formation processes, and which may be used in a sentence without any further modification (aside from the kinds of post-lexical processes relevant to strings of words). Only those lexical items which are "independent morphemes" can become words in this sense; bound lexical items, such as prefixes and clitics, are lexical items, but not words.⁷

There is no reason a priori to suppose that rules which concern one part of a lexical entry need have access to all parts (gf-bundle, phonological matrix and meaning) of the entry simultaneously. Thus I will argue below that merger refers only to gf-bundles, i.e., never requires phonological information. On the other hand, allomorphy⁸ facts depend on phonological matrices, albeit with reference to gf-bundles. One kind of rule does involve the entire lexical entry: word formation rules, since the entire lexical entry is available to the word formation component. "Post-lexical" phonological rules in the sense of Kiparsky (1982), involve gf-bundles and phonological matrices, because those are the two parts of the lexical entry available at that point in the derivation. (Notice that this implies that since meaning is interpreted at LF, independent of PF, no features about the meaning of individual lexical items can be relevant for post-lexical phonology.) I will claim that those processes which occur between category construction (to be explained below) and PF -- e.g., the move- α processes that render s-structure from d-structure -- do not have access to phonological information, and therefore refer only to gf-bundles. Throughout the discussion, I will assume the syntactic framework of GB as it is outlined in Chomsky (1981).

I contend that the traditional notion "lexical insertion", because it treats lexical items integrally, without distinguishing between their basic -- and separate -- components, conflates independent processes of the grammar. The first of these processes is the projection from the lexicon of the phrase structure of the sentence. The second consists in the phonological instantiation of the gf-bundles which are the terminal nodes of the phrase marker; this process I assume takes place at PF. A third process, the counterpart of phonological instantiation, but this time regarding the meaning of individual lexical items, is semantic interpretation, which occurs at LF. By recognizing the independence of these processes, the grammatical model accounts satisfactorily for the syntactically-determined allomorphy phenomena under investigation in this dissertation.



I will use the term "categorical construction" (hereafter, CC) to refer to the projection from the lexicon of the categorial information contained in the lexical items that constitute a sentence.⁹ CC is the process by which a d-structure is created: the categorial information is organized into a phrase structure which obeys the tenets of X-bar theory, and the gf-bundles of the lexical items are the terminal nodes of this phrase marker. I maintain that there is no independently existing structure into which lexical items are inserted whole; instead, the grammatical (as opposed to phonological) features of the lexical items themselves determine the phrase structure.¹⁰

Once CC yields a d-structure, the syntactic processes of move- α operate to rearrange constituents in allowable ways. The syntax has access to all relevant syntactic information from the creation of d-structure; the move- α processes move the gf-bundles (in such processes as NP or wh-movement), leaving traces of these moved bundles behind. Move- α gives rise to s-structures which may be different from the source d-structures by virtue of the effects of the move- α operation.

The syntactic operation of merger to be discussed in detail in Chapter 2 occurs at s-structure. Briefly, merger takes the terminal elements of two adjacent nodes -- in accordance with constraints to be identified in Chapter 2 -- and combines them into a single, composite gf-bundle with a specific categorial label. As we will see, merger is responsible for such phenomena as the inflected imperative verb and also semantically "proximate" verb-cum-conjunction complexes in Papago, and synthetic verbal and prepositional forms in Irish. After merger, s-structure "maps onto" two components: PF, which concerns the phonological

character of sentences, and LF, where semantic interpretation takes place. Perhaps the best way to think of this shift from the "syntax proper" to PF and LF is to consider the information contained in the lexical entry of an item which was inaccessible to the syntactic processes (i.e., the phonological matrix and the "meaning") as available at the appropriate component (PF and LF respectively). The claim here is that different facets of the lexical entry of an item are available to the rules of different components of the grammar. In fact, I assert that the rules of the syntax cannot refer to phonological information. By the same token, phonological rules are isolated from semantic information, and no rules of logical form may make reference to the phonological properties of an item. This claim is quite powerful, and I leave it to future research to decide if it is also valid.

PF is that component of the grammar at which phonological information becomes available. I will assume that a process of phonological insertion (hereafter, PI) associates phonological shapes with the gf-bundles composing the sentence. PI is in fact the logical foundation of the phonological component, because when phonological information about the constituents of the sentence is available, the phonological processes operating over sentences can apply.

Generally there is a one-to-one correspondence between gf-bundles and phonological matrices in the lexicon, each lexical item containing a unique gf-bundle linked to a unique matrix. However, because phonological matrices are a separate component of the lexical item, both instances where two or more phonological matrices are associated with a single gf-bundle, and cases where two

or more gf-bundles share a single phonological matrix, exist. These situations are the well-known phenomena of allomorphy and homonymy, respectively. I assume that a co-indexing procedure links phonological matrices to their respective gf-bundles. A phonological matrix associated with more than one gf-bundle has more than one index, linking it to all of its gf-bundle co-pairs.

For conceptual clarity, we may think of PI as a kind of linking rule implicit in each lexical entry, as embodied e.g., in the equation below.

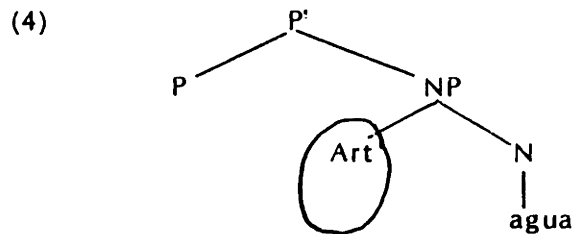
$$(2) \quad \begin{bmatrix} + \text{ V} \\ + \text{ intrans} \\ + \text{ 3} \\ + \text{ sg} \end{bmatrix} = \langle \text{runs} \rangle^{11}$$

The gf-bundle that was hitherto the terminal element is now linked to the phonological string which ultimately surfaces as runs.

A more complex example is that of the feminine singular definite article in Spanish. This article has two allomorphs: el before a noun beginning with a stressed /á/, as in el agua 'the water', and la elsewhere: la fruta 'the fruit'. These facts are captured in the sample lexical entry

$$(3) \quad \begin{bmatrix} + \text{ art} \\ + \text{ def} \\ + \text{ fem} \\ + \text{ sg} \end{bmatrix} \quad \begin{array}{l} = \langle \text{el} \rangle / \text{ ___ } [\acute{a} \text{ X } _N] \\ = \langle \text{la} \rangle \end{array}$$

The first option, el, is invoked in a context such as



In all other contexts the second option, la, surfaces. Thus the lexical entry contains the appropriate phonological strings, which enter the sentence via the operation of PI.¹²

Once the phonological matrices of the sentential constituents have been inserted, the post-lexical phonological processes assumed in Lexical Phonology occur, and possibly also stylistic movement rules. However, it follows from the organization of the grammar that movements in PF, whether stylistic local rules or move- α , cannot give rise to situations in which merger should occur.

In Chapter 4 I will discuss one post-PI process I call fusion, which is responsible for phenomena across a wide range of languages that are collectively termed "contraction". Fusion is that process that combines prepositions and immediately following definite articles into single words (e.g., *de le --> du in French), in French, Spanish, Irish, etc. During that discussion I will also contrast fusion with merger. The PF component ultimately yields a well-formed surface form of the sentence.

I will have little to say about the LF component here. I assume that semantic interpretation occurs there as suggested in Chomsky (1981) and much other current literature. As already stated, I hold that phonological information is not available -- and not made use of -- in LF. Just as PI provides the basis for the phonological portion of the grammar, I assume that an associative process similar to PI links gf-bundles to the meanings of individual lexical items. The important point is that the phonological and the semantic interpretation of grammatical features are taken to be separate, independent processes within the grammar, by virtue of the modular design of the grammar.

The foregoing discussion outlines my proposal for the organization of the grammar. It is highlighted by the double contribution from the lexicon, first from the list of lexical entries, yielding CC, and second in PI, together with the processes of merger and fusion, which apply at s-structure and PF respectively. Before going on to discuss the distinctions between this model and that of Anderson (1982), I briefly consider the notion of information "accessibility" which underlies the above model.

The grammar envisioned here contains constraints on the type of information available at given points in the development of the sentence. During the syntax proper (i.e., from d-structure through s-structure), only gf-bundles are available. This means that processes which occur within that component, such as move- α in the syntax, and also the merger process to be discussed below, make use only of the kinds of information included in the gf-bundles of lexical items. At

both PF and LF, gf-bundle information is still available, but that information is augmented by the phonological matrices inserted in PF by PI, and by the meaning of individual lexical items, at LF. There is a real division between PF and LF, on this model: both components refer to the information uniquely accessible in their respective components, but neither can make use of information available to the other (non-syntactic) component. Notice that grammatical information, on the other hand, is available at all points in the derivation.

I am assuming here, without going into detail, a model of grammar consistent with current work moving toward a diminution in the role of the phrase structure rules. This direction was undertaken with the introduction of X-bar theory (cf. Chomsky (1970); Jackendoff (1977)), and continues through such work as Stowell (1981) and Koopman (in preparation). The principal insight underlying this program of research has been that the properties of lexical items, listed in the lexicon, independently define well-formed phrase marker. The base rules are then necessary only to designate the maximal projection of a category (i.e., the "type" of a category; cf. Chomsky, (1970); Bresnan (1982)) and the relative positions of the head and its complements, specifiers, etc. within a phrase. Even this last kind of information has been redundant, at least in part; Sproat (1983) and Koopman independently propose that the position of the head follows from the theory in which government is directional for a given language. The CC process in the present model is meant to conform to those assumptions.

This model also follows in spirit the position of Generative Semantics regarding lexical insertion. In Generative Semantics a deep-structure represents

meaning, and from that deep structure is derived the surface structure, into which lexical material is inserted. The insight that the phonological aspect of lexical entries is not relevant to the syntactic processes, and may thus be isolated from those processes, is retained here.

1.3 Anderson's model. The model proposed above has several points of comparison with the account in Anderson (1982). Anderson considers the role of morphology within a theory of grammar, and implements his conclusions in a grammatical model which features "morphosyntactic representations", lexical insertion at s-structure, and a division between derivational and inflectional morphological processes. He offers an account of inflection which he calls "Extended Word and Paradigm" morphology. In the following discussion many details of Anderson's analysis will be omitted; I refer the reader to his paper for a more complete account.

Anderson begins by arguing against a strong version of the Lexicalist Hypothesis which prohibits syntactic rules from referring "to elements of morphological structure".¹³ He points out that several morphological properties of individual words are dependent on syntactic relations within a structure larger than a single word; he cites the case-marking of nouns by verbs (or other case-assigners), and agreement between nouns and adjectives as two examples where the syntactic structure in which a given word appears is reflected morphologically. He then considers a specific example of "syntactically relevant morphology" manifested in verbal agreement in Breton.

Verbs in Breton are inflected for (among other things) the person-number features of their subjects. With pronominal subjects, this yields surface forms such as

- (5) a. Bemdez e lennan eul levr
(everyday prt 1sg-read art book)
'I read (pres.) a book every day'
- b. Bemdez a lenn eul levr
(everyday prt 3sg-read art book)
'(S)he reads a book every day'
- c. Bemdez a lennont eul levr
(everyday prt 3pl-read art book)
'They read a book every day'

However, when an overt lexical NP subject is present, the verb appears in the third person singular form, regardless of the subject features of number or person.

- (6) a. Bemdez e lenn Yannig eul levr
(everyday prt 3sg-read Johnny art book)
'Johnny reads a book every day'

- b. Bemdez e lenn ar vugale eul levr
 (everyday prt 3sg-read the kids art book)
 'The kids read a book every day'

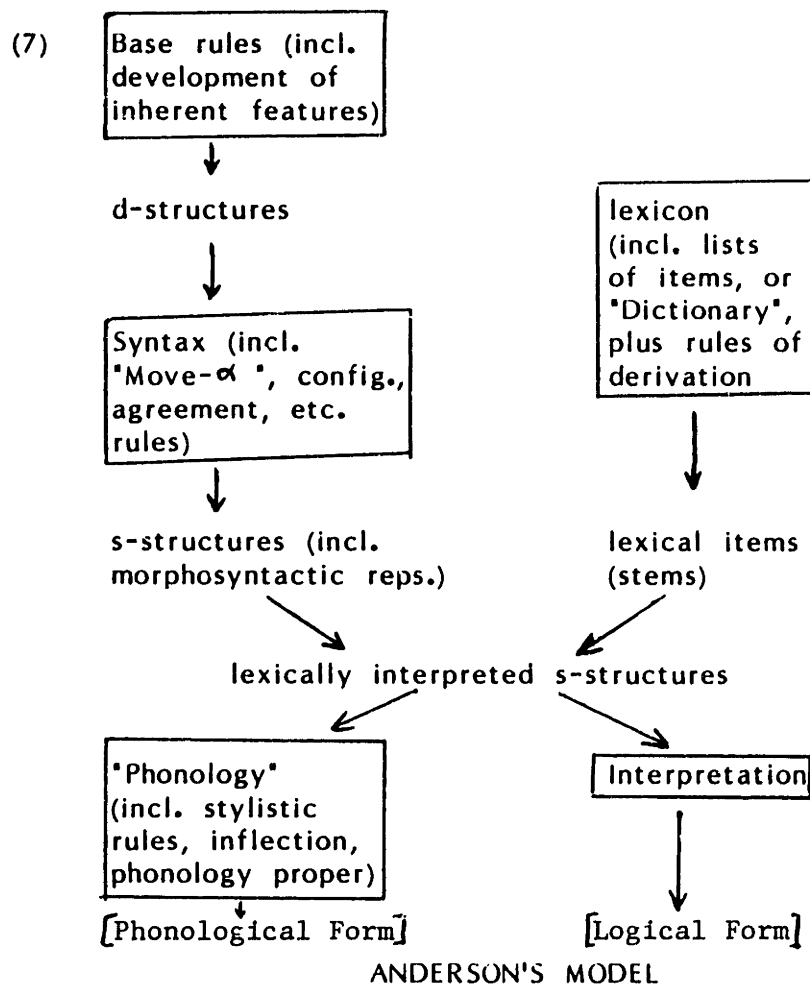
By assuming that the putative 'third person singular' form of the verb is in fact unmarked for person/number features,¹⁴ Anderson concludes that the generalization to be captured is that overt agreement and overt lexical NP subjects are complementary in Breton. He points out that this generalization is readily accommodated within the GB framework by the applications of the binding conditions defined in that theory, provided that agreement is considered a referential item. If agreement is a pronominal, by binding condition (a) it must be free in its governing category; condition (b) demands that an empty category must be properly bound in the governing category. If the subject position is assumed to be empty in (6), then the pronominal agreement morpheme of the inflected verb can bind the subject position. If the subject position is filled by an overt NP, overt agreement would bind that subject position improperly. Anderson supports his claim by adducing evidence of the pronominal nature of agreement.

How is agreement morphology generated? Anderson suggests that pronominal agreement actually is the set of subject pronouns, and posits an obligatory local rule which moves the subject pronoun into the position of verbal agreement. If the subject is something other than a pronominal, the rule will not apply; therefore the subject will remain in its own position, and no agreement morphology will appear. This identification of agreement as originally a subject pronoun

accounts for the precise distribution of agreement and overt subject NPs, as well as explaining the pronominal character of agreement.

Anderson concludes that Breton verbal morphology is an example of the interaction of syntactic operations (i.e., verbal inflection) with morphological elements (the subject pronoun cum agreement morpheme). He notes that the suppletive nature of such inflected verb forms makes it impossible to account for this phenomenon by simple cliticization of the subject pronoun to the verb.

Breton verbal morphology, along with the earlier-cited examples of nominal case-marking, and adjective agreement, Anderson observes, are instances of what is traditionally considered inflectional, as opposed to derivational, morphology. After examining several traditional definitions of the distinction between inflectional and derivational morphology, he recognizes this difference: inflectional, not derivational, morphology, "is what is relevant to the syntax". That is, inflectional morphology interacts with syntax, while derivational morphology does not. He captures this distinction by locating the morphological processes of inflection and of derivation at different sites in the organization of the grammar. His model of grammatical organization is reproduced below.



On Anderson's model, the lexicon produces a complete set of the stems of a language. These stems carry subcategorization information as well as all idiosyncratic information about a word, e.g., a suppletive past tense form for a given verb, or the like. The stems lack inflectional material, since inflection on this model takes place in the syntactic and phonological components. The creation of well-formed lexical stems, including derived stems but not inflected stems, is independent of the syntax.

The base rules of the language, in isolation from the lexicon, produce lexical categories as the terminal elements of phrasal nodes. These lexical categories are enhanced by feature bundles which designate features that are inherent in a particular lexical item (e.g., gender is an inherent feature of nouns in some languages). Other syntactic processes, such as case assignment, or the copying of features from noun to adjective for agreement purposes, further expand these feature bundles. The full feature array is called a morphosyntactic representation.

Lexical insertion is the association of lexical representations with fully-formed morphosyntactic representations, yielding lexically interpreted s-structures. These lexically interpreted s-structures in turn feed into both the phonological and interpretive components. In the phonology, rules such as the inflectional rules (to be discussed below), and the rules of the phonology themselves, have access to both the inflectional features (contributed by the morphosyntactic representation), and the phonological shape of the stem, contributed by the lexicon.

Inflection is viewed as a set of rules which develop a surface form by systematically altering the lexical (phonological) shape of a lexical item in a specific way consistent with the morphosyntactic representation of that item. The domain of these rules is the ordered pair $\{S, M\}$, where S is "the most specifically characterized phonological stem form of the item", and M is the morphosyntactic representation. When two or more phonological shapes are listed in the lexical entry, as in the case of the irregularly inflected past tense form

of think, i.e., thought, the more specific form has precedence over the general form. Thought is specific as [+past], while think bears no tense specification. Therefore, thought supercedes think when the morphosyntactic representation includes the [+past] feature. Thought blocks *thoughted because the fact that it is lexically specified in the lexical entry as the past tense form of think gives it precedence over the general inflectional rule adding /d/ to a verb to form the past tense.

The Extended Word and Paradigm morphology model thus separates inflectional from derivational processes, and spreads the "field" of morphology over three locations within the grammar: derivational processes occur in the lexicon, morphosyntactic representations are constructed in the syntax, and the phonological realization of inflection takes place in the phonological component. This division among the facets of morphology makes several predictions about the grammar. The first is that, since inflection operates on fully-formed (i.e., already-derived) lexical stems, inflectional affixes will appear "outside" of derivational affixes, which conforms to observations. The next is that results of inflectional morphology cannot affect semantic interpretation, because the phonological component, where inflection takes place, is isolated from LF. On the other hand, because derivation occurs in the lexicon and its effects are available to LF via lexical insertion into the s-structures which eventually map onto LF, derivation should (and does) have a role in semantic interpretation.

Finally, Anderson points out that phonological rules may interact with morphological processes, as for example in morphological reduplication based on

the results of prior phonological operations. He suggests that his model predicts a restriction of such interaction to inflectional morphology and phonology, since inflection is a part of the phonological component. Recall that derivation, on the other hand, occurs within the lexicon, independent of (and prior to) PF. If in fact derivation did interact with phonology in significant ways, Anderson suggests he would adopt an approach such as Lexical Phonology, which allows the phonological processes to apply to the results of derivation (as well as inflection).

1.4 Comparison of merger and Anderson models. As I remarked above, there are many similarities between Anderson's grammatical overview and the merger model. Both models assume that the process of 'lexical' (i.e., phonological) 'insertion' occurs after syntactic, move- α type movements have operated. The fully-formed morphosyntactic representation in Anderson's model roughly corresponds to the gf-bundles of the merger proposal. The notion that inflection, but not derivation, is related to the syntax is also common to both models.

However, there are several significant conceptual distinctions between the two models. Anderson posits a set of base rules to generate phrase structures; the merger model projects a constituent structure from the lexical entries of individual sentential components. Since the lexical entries contain the information relevant to phrase structure (i.e., gf-bundles in the merger model) anyway, it is perhaps unnecessary to duplicate such information in a base rule.

On the merger model, the phonological realization of both derivational and inflectional processes occurs in the lexicon, and fully-formed phonological strings are associated with gf-bundles during PI, after s-structure thus establishing PF. The actual (phonological) formation of words is therefore independent of the syntactic evolution of a sentence. In contrast, Anderson separates the phonological realization of derivational processes from that of the inflectional processes, by locating derivation in the lexicon prior to lexical insertion, and placing inflection in the phonological component, along with the phonology proper, after lexical insertion. Thus the actual phonological formation of words follows lexical insertion.

To put this another way, the merger model assumes that the syntactic development of the sentence, and the phonological evolution of the words which compose the sentence, are entirely separate occurrences. The results of these separate processes are united via PI. For this reason the phonological side of inflection, as well as derivation, is taken to occur in the lexicon. The fact that syntactic processes such as merger are morphophonologically reflected as "inflection" phenomena is understood to be a distinct issue from the consideration of the phonological processes affecting words of the language. Anderson maintains, on the other hand, that the phonological development of lexical items takes place after those items are inserted into syntactic structures. Thus on his model, lexical insertion combines lexical stems and sentential structures, leaving the phonological development of those lexical stems until later in the derivation. On the merger model, phonological material inserted during PI has already undergone the phonological processes which affect individual lexical items. In

Anderson's model there is no obvious distinction between those phonological processes which concern individual words (i.e., lexical processes in Kiparsky's (1982b) sense), and phonological processes associated with strings of words (post-lexical phonology for Kiparsky).

As I have suggested, the differences between the merger proposal and Anderson's proposal represent a conceptual, rather than a specific, empirically-decidable, distinction. There is no real distinction between merger in the present model and the incorporation analysis proposed by Anderson. Incorporation in the syntax on Anderson's analysis is parallel to the merger of *gf*-bundles in this model. I will return to this point in relation to Modern Irish verbal and prepositional inflection in section 2.2 below. Both models account for straightforward allomorphy problems like the question words in Papago discussed in Chapter 3. Since Anderson does not consider data like the fusion examples in Chapter 4, it is unclear whether the models converge on that point as well. I will simply adopt the conventions of the merger model without further comment here.

The remaining chapters of this dissertation are organized as follows. In Chapter 2, I consider three cases of inflection, which I argue to be instances of merger. I discuss the merger proposal in detail, and compare it to Anderson's account of Breton. Chapter 3 contains examples of allomorphy determined by syntactic position, although no evidence of merger is found in those examples. Instead, Chapter 3 argues in favor of the basic division between CC and PI in the merger model of grammar. Chapter 4 examines the phenomenon of fusion, which,

unlike merger, requires information from both the gf-bundles and the phonological matrices of lexical items. I discuss the distinctions between merger and fusion, and claim that both fusion and merger are necessary components of the model.

1. Cf. Chomsky (1981).
2. Cf. Kiparsky (1982a).
3. The question of whether English has two or three levels in the word formation component is not of crucial importance here. I adopt the formulation of Kiparsky (1982a).
4. Whorf (1946) originated the use of the term "pausal form" to refer to this phenomenon in Hopi. The term is also used in reference to verbal alternations in Tiberian Hebrew. For a discussion of the Tiberian Hebrew case, cf. Dresher (1983) and also Rappaport (in preparation).
5. Cf. Jeanne (1978).
6. I assume that syntactic operations can affect the phonological matrix of a lexical item only within the context of a sentence. If the word is spoken in isolation, no syntactic processes can alter it in any way. I observe this here, in anticipation of my comment later in this chapter that phonological processes which affect words, and phonological processes which affect sentences, are distinct. Cf. the lexical/post-lexical phonological rule distinction in Kiparsky (1982a,b), Mohanan (1982), and others.
7. Bound lexical items are not words because they never exit the word formation component independently; they must be attached to another (unbound) lexical item.
8. I will use "allomorphy" in a technical sense here, reserving it to refer to those cases where two phonological shapes of a lexical item alternate in specifiable syntactic contexts without change of, or loss of, either category status, or any other grammatical features. Allomorphy in this sense is to be distinguished from the cases where a string of lexical items alternates with a single "inflected" item, as in the instances of inflection in Chapter 2. It is also to be distinguished from the results of fusion discussed in Chapter 4, where I claim that two lexical items are rewritten as a single word in PF.
9. Cf. Stowell (1981).
10. Individual lexical items are assumed here to be "associatively selective" in that properties of individual items may determine some features about the structures in which they may appear. The consequences of the choice of certain lexical items in forming a sentence often influences the shape of that sentence. Compare the two semantically-identical sentences of Portuguese:

Pedi para eles saírem
 (ask:perf:1sg prt they leave:3pl)
 'I asked them to leave'

Pedi que eles saíssem
 (ask:perf:1sg that they leave:past subjunctive)
 'I asked them to leave'

The choice of para or que following pedi determines the form of the dependent clause. This was pointed out to me by John Martin.

11. I will use angled brackets surrounding standard orthographic representations to designate phonological matrices without resorting to a full phonological transcription.

12. I assume that there is no difference, for the purposes of PI, between the phonological matrices of lexical items formed by affixation/compounding processes within the word formation component, and the phonological matrices of nonderived items. This will become significant in Chapter 2 and later, when I maintain that a "merged" form like the inflected imperative verb in Papago has its phonological matrix inserted via PI in the same way that a nonmerged form like Papago AUX is phonologically instantiated during PI.

13. Anderson refers explicitly to La Pointe's (1979) formulation of the Lexicalist Hypothesis, although his remarks are germane to many other strong versions of this hypothesis, as well.

14. Anderson cites Benveniste regarding the "non-person" status of the third person pronoun. Cf. Martin (1978) for similar arguments based on an investigation of 'subject-less' sentences in Spanish.

CHAPTER TWO: THREE CASES OF INFLECTION

2. Three cases of inflection. In this chapter I consider three examples of the interaction of syntax and morphology in the phenomenon of inflection. I begin with the AUX in Papago, focussing on imperative sentences. I follow Hale's (1980; cf. also Hale 1969) syntactic analysis of AUX, and propose the "AUX rule" to account for the consistently second position of AUX in the sentence. The imperative sentences, unlike nonimperatives, exhibit a kind of inflectional morphology under a specific syntactic configuration: verb-initial imperatives contain a merged verb-AUX form not found in non-verb-initial imperatives. Arguing that the syntactic analysis of imperatives is not compatible with the traditional notions of lexical insertion and the word-formation processes reviewed in Chapter One, I develop the operation "merger" to explain the morphological distinctions between verb-initial and non-verb-initial imperatives. Merger allows the sentence-initial verb AUX ... sequence to be replaced by the merged form under circumstances to be described.

The next part of the chapter examines inflection in Modern Irish. I draw a parallel between Papago imperative morphology and the inflected forms of Irish, showing that the merger analysis accomodates the Irish facts as well as those of Papago. In this section I review Anderson's (1982) analysis of Breton inflection as the result of the incorporation of the subject into the verb, and conclude that in essence the merger and incorporation proposals are equivalent.

In the last section I return to Papago to treat proximate conjunction morphology. Unlike the first two cases of inflection where a specific sequence is replaced by a morphologically unique form, the merged forms which replace a clause-final verb + conjunction sequence are isomorphic with -- but not syntactically identical to -- a set of participials independently existing in Papago. This fact lends support to the claim in Chapter 1 that PI is not sensitive to the origin of a gf-bundle. PI associates phonological matrices with gf-bundles, without regard to whether the gf-bundle is the result of merger, as in the case of verb-conjunction complexes, or the simple result of projection into d-structure from the lexicon, as I argue is the case with the participials.

Throughout the chapter I will confine my attention to a single type of inflectional morphology, characterized by an alternation between independent lexical items in one syntactic context, and a single "inflected" item in another syntactic context. In these cases, the "inflected" form exhaustively replaces the sequence of independent items. I call this kind of inflection "merger" inflection, meaning that one constituent merges (combines with) another to create the inflected form. I will not consider tense/aspect inflection of verbs, nor case-marking inflection of nouns. Merger inflection poses a particular problem for the traditional notion of "lexical insertion into d-structure": often, the syntactic context for one member of the alternating pair (either the inflected or the noninflected partner) is established later in the derivation than d-structure, making determination of the correct phonological shape at the level of d-structure impossible.

2.1 The Papago AUX. I begin this section with an exposition of the structure of the Papago sentence. My concentration will be on AUX: its sentential position, its generation within the phrase structure grammar of Papago, and its idiosyncrasies. I will establish first the sentential-second position of AUX as a quite regular occurrence, with two exceptions discussed in some detail. Second, I will argue that AUX is base-generated initially and that subsequent movement of specific items to initial position results in the sentential-second position of AUX.

Word order in Papago is determined by the interaction of a system of relative orders between constituents and a convention which defines certain sentential positions. The verb and its arguments are freely ordered relative to each other. In a simple intransitive sentence, the subject can precede the verb, as in (1), or follow it, as (2) shows.

- (1) a. Huan 'o cikpan.
 (John AUX:imperf-3 work:imperf)
 'John is working.'
- b. 'aapi 'ap cikpan.
 (You AUX:imperf-2sg work:imperf)
 'You are working.'
- (2) a. Cikpan 'o g Huan.
 (Work:imperf AUX:imperf-3 art John)
 'John is working.'

- b. Cikpan 'ap ('aapi).
 (Work:imperf AUX:imperf-2sg (you))
 'You are working.'

The overt subject pronoun is optional, since its pronominal features are fully specified in the morphology of the auxiliary (hereafter AUX). The article g is absent when NP is sentence-initial. However, a determiner like hegai 'that' can be sentence-initial.

- (3) Hegai ceoj 'o cikpan.
 (That man AUX:imperf-3 work:imperf)
 'That man is working.'

The AUX here is imperfective, and consists of a semantically-empty base element a plus the person/number marker as given below:

	<u>singular</u>	<u>plural</u>
1	'a ^h	'ac
2	'ap	'am
3	'o	

In third person, the number distinction is merged, and the vowel is ablauted.

The object argument is ordered freely with respect to both the verb and the subject. AUX, on the other hand, repeatedly follows whichever of these constituents is first.

- (4) a. Huan 'o g wisilo ceposid.
 (John AUX art calf brand:imperf)
 'John is branding the calf.'
- b. 'aapi 'ap g wisilo ceposid.
 (You AUX art calf brand:imperf)
 'You are branding the calf.'
- c. Wisilo 'o ceposid g Huan.
 (Calf AUX brand:imperf art John)
 'John is branding the calf.'
- d. Wisilo 'ap ceposid ('aapi).
 (Calf AUX brand:imperf (you))
 'You are branding the calf.'
- e. Ceposid 'o g Huan g wisilo.
 (Brand:imperf AUX art John art calf)
 'John is branding the calf.'
- f. Ceposid 'ap ('aapi) g wisilo.¹
 (Brand:imperf AUX (you) art calf)
 'You are branding the calf.'

The negative particle pi, unlike the arguments of the verb, has a fixed position relative to the verb: it always precedes the verb, and no verbal

arguments can intervene. Once the position of the verb and its arguments is established, the position of pi is determined:

- (5) a. Huan 'o pi cikpan.
(John AUX NEG work:imperf)
'John is not working.'
- b. Pi 'o cikpan g Huan.
(NEG AUX work:imperf art John)
'John is not working.'
- c. Huan 'o g wisilo pi ceposid.
(John AUX art calf NEG brand:imperf)
'John is not branding the calf.'
- d. Pi 'o ceposid g Huan g wisilo.
(NEG AUX brand:imperf art John art calf)
'John is not branding the calf.'
- e. Wisilo 'o pi ceposid g Huan.
(Calf AUX NEG brand:imperf art John)
'John is not branding the calf.'

Since pi must precede the verb, no verb-initial order is grammatical for (5). While the arguments of the verb cannot interrupt the pi ... V sequence, AUX can.

Locative 'am is another particle that, like pi, has a fixed position with respect to the verb.

- (6) a. 'aapi 'ap 'am cikpan.
 (you AUX there work:imperf)
 'You are working there.'
- b. 'am 'ap cikpan ('aapi).
 (there AUX work:imperf (you))
 'You are working there.'

When both pi and 'am are present, their relative order to the verb is first pi, followed by 'am (now in a special form 'am-hu), and then the verb.

- (7) a. Huan 'o pi 'am-hu cikpan.
 (John AUX NEG there work)
 'John is not working there.'
- b. Pi 'o 'am-hu cikpan g Huan.
 (NEG AUX there work art John)
 'John is not working there.'

Again AUX, but not the arguments of the verb, can break up the particle - verb sequence.

In contrast to the relative constituent orders described above, AUX is consistently found in sentential second position. The data in (1) - (7) reveal that AUX has a fixed position -- second -- no matter which other element is first. in general, for the class of sentences examined here, sentential second

position is obligatory for AUX.² Thus, the position of AUX remains independent of the relative ordering between categories discussed above.

I have shown that the interplay between restrictions on the relative order of constituents and the generally obligatory second position of AUX defines sentential word order. Major phrases like the predicate and its arguments are generated in some order; those minor items like pi, 'am, etc. whose positions are relative to the verb are thereby also placed. The position for AUX is determined separately from -- and logically after -- the other items are in place, because it is only after the selection of major category positions (and the accompanying restrictive ordering of particles like pi relative to a certain category,) that the sentential second position can be identified. This division between word order linked to specific syntactic categories, and word order as a function of sentential position is the basis for the analysis of AUX that follows.

In considering where AUX is found in the base, and how it ends up in second position, I want to retain the generalization articulated above: second position is usually obligatory for AUX. That is, the schema X AUX correctly defines the ordering of the first two elements in the sentence; when X = V, as in (2), the schema represents the minimal sentential structure required. As the foregoing data demonstrate, X can also be instantiated by NP, as in (1); by many preverbal particles as shown in (5) and (6); and by some verbal prefixes which I will examine below. I will return to the question of which elements can precede second position AUX.

A second and overlapping concern of this analysis is the variability of the definition of "second position". AUX sometimes follows entire phrases and sometimes interrupts them. In a sentence with a pronominal object, that object is prefixed to the verb:

- (8) a. Huan 'o ('a:ñi) ñ-ñeid.
 (John AUX:imperf-3 (I) me-see:imperf)
 'John sees me.'
- b. Ñ-ñeid 'o g Huan.
 (Me-see:imperf AUX:imperf-3 art John)
 'John sees me.'
- c. Huan 'o t-ñeid.
 (John AUX:imperf-3 us-see:imperf)
 'John sees us.'
- d. T-ñeid 'o g Huan.
 (Us-see:imperf AUX:imperf-3 art John)
 'John sees us.'
- e. Huan 'o m-ñeid.
 (John AUX:imperf-3 you-see:imperf)
 'John sees you.'
- f. M-ñeid 'o g Huan.
 (You-see:imperf AUX:imperf-3 art John)
 'John sees you.'

- g. Huan 'o 'em-ñeid.
 (John AUX:imperf-3 you(pl)-see:imperf)
 'John sees you (pl.).'
- h. 'Em-ñeid 'o g Huan.
 (You(pl)-see:imperf AUX:imperf-3 art John)
 'John sees you (pl.).'

The third person singular (nonreflexive) object is not marked overtly.

- (9) a. Huan 'o ñeid.
 (John AUX:imperf-3 see:imperf)
 'John sees (him).'
- b. Ñeid 'o g Huan.
 (See:imperf AUX:imperf-3 art John)
 'John sees (him).'

Here AUX follows the verb. However, with third person plural ha or the reflexive pronoun 'e, AUX can either follow the verb or subject, parallel to (8), or it can appear directly after the prefix, thereby separating prefix from verb:

- (10) a. Huan 'o ha-ñeid.
 (John AUX:imperf-3 them-see:imperf)
 'John sees them.'

- b. Huan 'o 'e-ñeid.
(John AUX:imperf-3 self-see:imperf)
'John sees himself.'
- c. Ha-ñeid 'o g Huan.
(Them-see:imperf AUX:imperf-3 art John)
'John sees them.'
- d. 'E-ñeid 'o g Huan.
(Self-see:imperf AUX:imperf-3 art John)
'John sees himself.'
- (11) a. Ha-'o ñeid g Huan.
(Them-AUX:imperf-3 see:imperf art John)
'John sees them.'
- b. 'E-'o ñeid g Huan.
(Self-AUX:imperf-3 see:imperf art John)
'John sees himself.'

The contrast between items like ha and 'e on the one hand, and the rest of the object pronouns on the other, suggests that ha and 'e are optionally prefixes, while the others are only prefixes.³ If prefixation occurs,⁴ the prefix-verb complex behaves as a single (verbal) word, and AUX ends up to the right of the entire unit. When no prefixation takes place, ha or 'e is itself a word after which AUX can appear. Object pronouns will be generated immediately before the verb in the phrase structure schema that follows shortly.

The verbal prefix s-, an affirmative particle required by certain verbs and adjectives when they (V and Adj) are not negated, also obligatorily prefixes to a following verb:

- (12) a. S-hooho'id 'a^h g Huan.
 (s-like:imperf AUX:imperf-1sg art John)
 'I like John.'
- b. Huan 'a^h s-hooho'id.
 (John AUX:imperf-1sg s-like:imperf)
 'I like John.'

Like the obligatorily prefixing object pronouns (and therefore unlike ha and 'e), s- cannot be separated from the verb by an intervening AUX. When an s- prefixed verb also has a pronominal object, the object follows s-:

- (13) a. S-^h-hooho'id 'o g Huan.
 (s-me-like:imperf AUX:imperf-3 art John)
 'John likes me.'
- b. Huan 'o s-^h-hooho'id.
 (John AUX:imperf-3 s-me-like:imperf)
 'John likes me.'
- c. S-ha-hooho'id 'a^h
 (s-them-like:imperf AUX:imperf-1sg)
 'I like them.'

- d. Huan 'o s-ha-hooho'id
(John AUX:imperf-3 s-them-like:imperf)
'John likes them.'
- e. S-ha-hooho'id 'o g Huan.
(s-them-like:imperf AUX:imperf-3 art John)
'John likes them.'
- f. Huan 'o s-'e-hooho'id
(John AUX:imperf-3 s-self-like:imperf)
'John likes himself.'
- g. S-'e-hooho'id 'o g Huan
(s-self-like:imperf AUX:imperf-3 art John)
'John likes himself.'

To reiterate, with ha or 'e (and only with these two objects) AUX can intervene between the object prefix and the verb:

- (14) a. S-'e 'o hooho'id g Huan.
(s-self AUX:imperf-3 like:imperf art John)
'John likes himself.'
- b. S-ha 'añ hooho'id.
(s-self AUX:imperf-1sg like:imperf)
'I like them.'

The explanation for the variability of the AUX position with regard to s-ha and s-'e combinations falls out from the fact that ha and 'e are only optionally

prefixed to a following verb: exactly as with (10) and (11), when ha, 'e prefix, AUX cannot intervene, as seen in (13), and when they do not prefix, AUX can intervene, as happens in (14). S-, then, must prefix obligatorily to whatever follows it, here a pronominal object prefix or the verb.

We have now seen four different kinds of elements whose positions are preverbal and in fixed order relative to each other. Pi must precede 'am; an object pronoun must be followed immediately by the verb, and prefix s- appears immediately before an object pronoun. These positional relations are captured by

(15) $V' \rightarrow (NEG) (LOC) (\underline{s-}) (OBJ) V$

where everything except V is optional, and the labels 'NEG', 'LOC', etc. refer to the classes of items, rather than the individual items themselves, that may appear in the given order before the verb. Rule (15) anticipates one of the phrase structure expansions to be developed below. I revise (15) immediately, however, by introducing yet another particle-class, represented by cem 'try', which follows (LOC) but must precede (s-):

(16) Huan 'o 'am cem cikpan.

(John AUX there try work)

'John is trying to work there.'

I therefore expand (15) to (17).

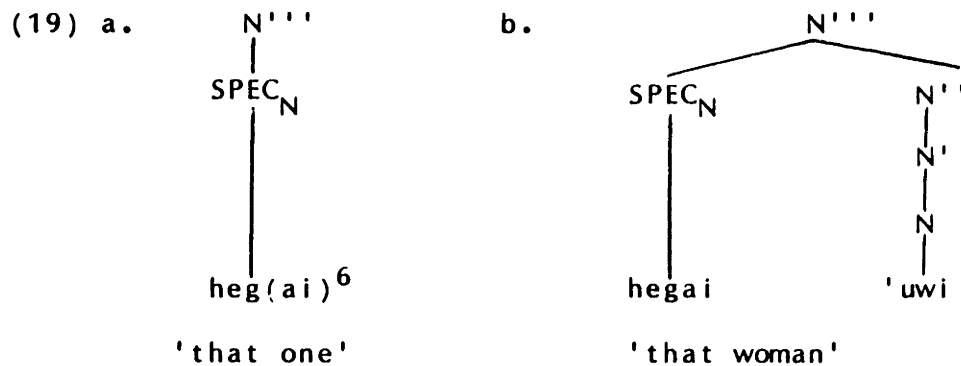
$$(17) \quad V' \rightarrow (NEG) (LOC) (CEM) (\underline{s-}) (t BJ) V$$

Below I will further modify (17); its present formulation is sufficient here.⁵

Before formulating a specific rule to move AUX (and consequently define "second position" for Papago), I turn to the general phrase structure schemata of Papago. I will continue to use the traditional form of phrase structure rules; however, these should be thought of as schemata defining well-formed projections from the lexicon for the lexical categories of the language. Consider the X-bar phrase structure schemata in (18), where the three-bar level is the maximal projection of X and the sentence is a projection of V.

$$(18) \quad \begin{array}{lll} \text{a.} & X''' & \rightarrow \text{SPEC}_X (X'') (V''') \\ \text{b.} & X'' & \rightarrow ([-V]''')^* X' (V''') \\ \text{c.} & X' & \rightarrow \dots X \end{array}$$

Rule (18.a), where the "head" (X'') is optional, is intended to account for the observation that a SPEC_X by itself may fully specify X''' . Thus both structures in (19) are grammatical:

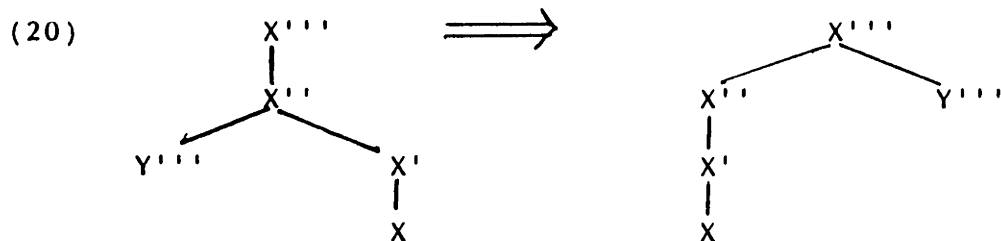


Hale notes that while $SPEC_N$, the article of an NP, and $SPEC_P$, a kind of prepositional marker co-occurring with PPs, may fully constitute N''' and P''' respectively, $SPEC_V$ (i.e., AUX) alone is not a sufficient expansion of V''' . The case of AUX fully specifying V''' will be ruled out on semantic grounds, since AUX and V function in concert to encode the full tense/aspect information for the sentence, and AUX alone could therefore not provide enough information. The optional V''' following X'' in (18.a) indicates that for all phrasal categories, phrase-final dependent clauses may occur.

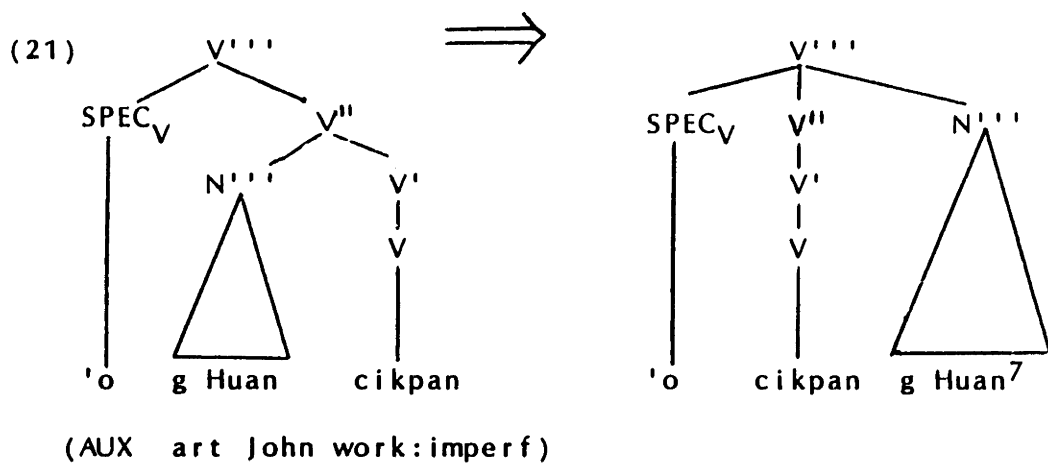
The two-bar level described by (18.b) positions nonverbal complements to the left of X'; the '*' designates "zero or more". (Phrase-final subordinate clauses are also optional at this level as well as the X''' level.) The arguments are subject to a coherence condition that requires each overt syntactic argument to be linked to an A-position in the argument structure of X' (i.e., must be assigned a θ -role); cf. Bresnan (1982) on coherence and Chomsky (1981) on the θ -criterion. A sentence with fewer arguments than the number of [-V]''' complements selected by X' will be regarded as an instance of PRO-drop (see Hale (1980) for details); a

sentence containing more complements than the argument structure of X' allows will be ill-formed.

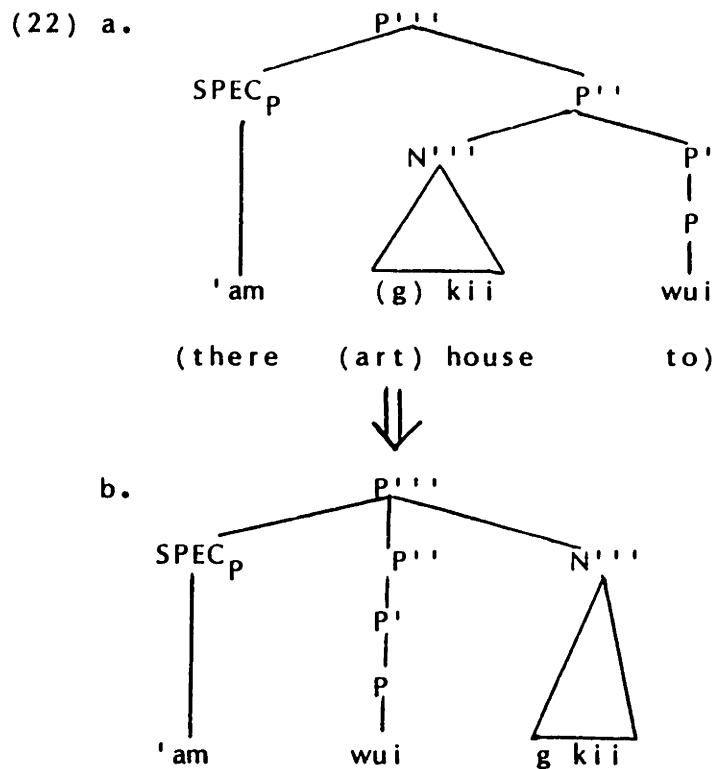
The "scrambling" effect observed in Papago sentences is captured here by the extraposition rule (20). This rule allows an argument of a phrasal head (i.e., a daughter of X'') to move rightward from its original prenuclear position and reattach as a sister to the X'' .



In a sentence, (20) yields post-positioned verbal arguments, as in (21), where the subject N''' g Huan is extraposed rightward into postnuclear position following V .



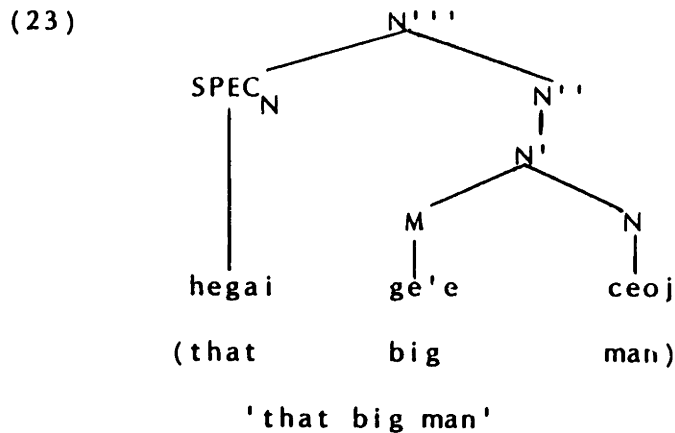
The extraposition rule (20) accounts not only for the scrambling of major phrasal constituents like the predicate and its arguments, but also for scrambling (in surface structure) of the subconstituents within a major phrase. For example, an object NP may appear on either side of an adposition: [= Hale, 1980, (22)]



If more than one object is inserted, the structure is ruled out because the adposition wui 'to' selects (or, assigns a θ -role to) a single argument in its argument structure, and cannot assign θ -roles to two overt objects.

By (18.c) Hale asserts that one-bar level structures are always nucleus-final. We have already seen in (17) some of the items introduced at the V' level. N' contains pronominal modifiers like ge'e 'big'. I will label 'M' for

"modifier" all prenuclear material in the expansion of X' , using '*' to indicate infinite (possible) iteration: $X' \rightarrow M^* X$.



The intensifier si is one of the items found in prenuclear position in P' .

For ease of reference I repeat below all the phrase structure schemata so far discussed.

- (24)
- a. $X''' \rightarrow \text{SPEC}_X (X'') (V''')$
 - b. $X'' \rightarrow ([-V]''')^* X' (V''')$
 - c. $X' \rightarrow M^* X$
 - d. $V' \rightarrow (\text{NEG}) (\text{LOC}) (\text{CEM}) (\underline{s-}) (\text{OBJ}) V$

There is evidence to support the base-generation of AUX in initial position. The only position other than second in which AUX is ever found is initial: the first of two cases to be studied here is that of AUX being sentence-initial when it bears a prefix. There are three principal AUX prefixes; the first of these is

the yes-no interrogative n- which forms with AUX what I will call intAUX. It is formed by the simple prefixation of n- to AUX. The intAUX paradigm for the data under consideration is listed below.

	<u>singular</u>	<u>plural</u>
1	nañ	nac
2	nap	nam
3	no	

IntAUX is always sentence-initial.

- (25) a. No g Huan cikpan?
 (intAUX:imperf-3 art John work:imperf)
 'Is John working?'
- b. No cikpan g Huan?
 (intAUX:imperf-3 work:imperf art John)
 'Is John working?'
- c. Nap 'aapi pi cikpan?
 (intAUX:imperf-2sg you neg work-imperf)
 'Aren't you working?'
- d. Nam pi cikpan?
 (intAUX:imperf-2pl neg work:imperf you)
 'Aren't you (pl) working?'

Both the subordinating m- and the obviative ku- prefixes to AUX function syntactically like the interrogative prefix: they are prefixed to AUX in the regular way, and the resulting complex is always clause-initial. Examples are listed with the imperfective paradigms of subAUX m- and obvAUX ku-:

- (26)
- | | <u>singular</u> | <u>plural</u> |
|---|-----------------|---------------|
| 1 | mañ | mac |
| 2 | map | mam |
| 3 | | mo |
- a. . . . map 'aapi pi cikpan.
(subAUX:imperf-2sg you neg work:imperf)
' . . . that you are not working.'
- b. . . . map pi cikpan 'aapi.
(subAUX:imperf-2sg neg work:imperf you)
' . . . that you are not working.'
- c. . . . mo pi 'am-hu cikpan g Huan
(subAUX:imperf-3 neg there work:imperf art John)
' . . . that John is not working there.'
- d. . . . mo g Huan pi 'am-hu cikpan
(subAUX:imperf-3 art John neg there work:imperf)
' . . . that John is not working there.'

(27)	<u>singular</u>	<u>plural</u>
1	kuñ	kuc
2	kup	kum
3	k	

- a. K g Huan pi cikpan.
(obvAUX:imperf-3 art John neg work)
'And John isn't working.'
- b. K pi cikpan g Huan.
(obvAUX:imperf-3 neg work art John)
'And John isn't working.'
- c. Kup 'am cikpan.
(obvAUX:imperf-2sg there work:imperf)
'And you are working there.'
- d. Kup 'am cem cikpan.
(obvAUX:imperf-2sg there try work)
'And you are trying to work there.'

Any AUX movement rule into second position will have to exclude the movement of prefixed AUX.

A second motivation for an AUX-initial base can be appreciated from a consideration of sentences expressing future time. The future is identified by the pre-verbal particle o together with the "t-AUX", that is, the AUX used in all futures and also in nonfuture perfectives, in conjunction with a perfective or

imperfective future verb. (Below I will illustrate using perfectives.) The t-AUX contains t suffixed to the imperfective AUX; it is shown in the future construction in (28) below.

	<u>singular</u>	<u>plural</u>
1	'ant	'att
2	'apt	'amt
3	'at	

Here [ñ] and [c], in first person singular and plural respectively, are replaced by their dental counterparts as a result of assimilation.

- (28) Huan 'at o cikp.
 (John AUX-3 FUT work:perfective)
 'John will work.'

Future o is not a verbal prefix. Both the cem class of particles and object prefixes can appear between o and the verb:

- (29) a. Huan 'at o cem cepos g wipsilo.
 (John AUX-3 FUT try brand:perf art calves)
 'John was going to brand the calves.'
- b. Huan 'at o ha-cepo .
 (John AUX FUT them-brand:perf)
 'John will brand them.'

in light of (29), I further refine (17) as

(30) V' --> (NEG) (LOC) (FUT) (CEM) (s-) (OBJ) V

Future o interacts with AUX differently from other preverbal particles. As long as some constituent other than V is sentence-initial, AUX is as usual in second position.

(31) Huan 'at o cikp.
(John AUX-3 FUT work:perf)
'John will work.'

But when o is first in M, AUX appears first in the sentence, contrary to expectations:

(32) a. T o cikp g Huan.
(AUX-3 FUT work:perf art John)
'John will work.'

b. Pt o cikp ('aapi).
(AUX-2sg FUT work:perf (you))
'You will work.'

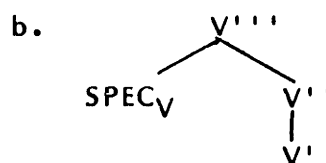
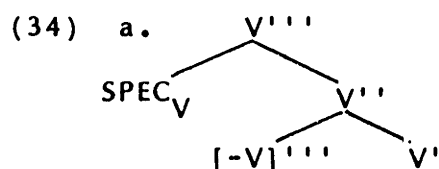
Future o does not permit AUX to appear to its right. When t-AUX is forced by a leftnext o (i.e., as will be shown below, when o is the leftmost member of V' for the sentence) to remain sentence-initial, it loses its base-sequence 'a-.

I turn now to the rule which results in second-position AUX. Following Hale (1980) I assume that a rule involving "a leftward⁸ movement of some element in V'' sister-adjoins the moving element to the left of the AUX" (p.37). This rule is possibly a move- α rule, although this movement does not seem to involve any kind of trace.⁹

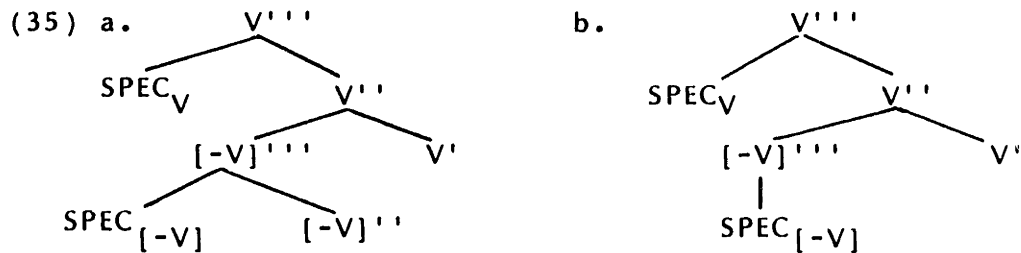
Using the phrase structure schemata (24), V'' is obligatorily expanded as (33) (ignoring the optional clause-final V'''):



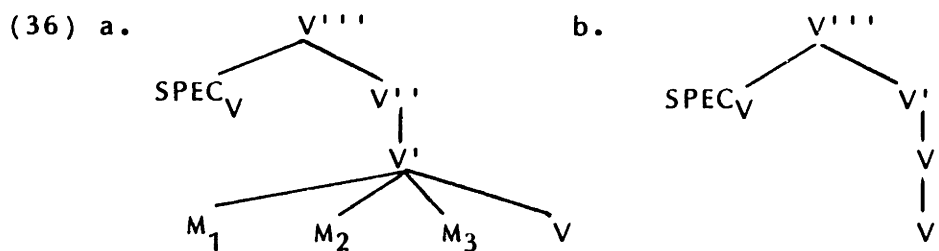
V'' of (33) may have as possible daughters only $[-V]'''$ and V' (again ignoring the optional V'''). In what follows, I will be interested only in the leftmost daughter of V'' for any sentence, since the AUX rule will concern only this member of a (possibly larger) V'' .



The $[-V]'''$ daughter of V'' is in turn expandable in one of two ways:



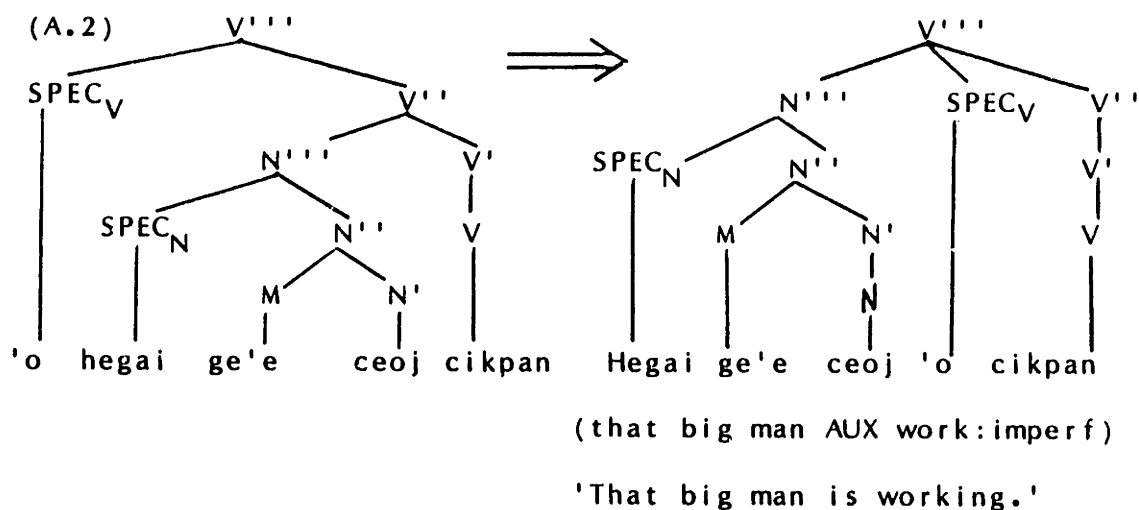
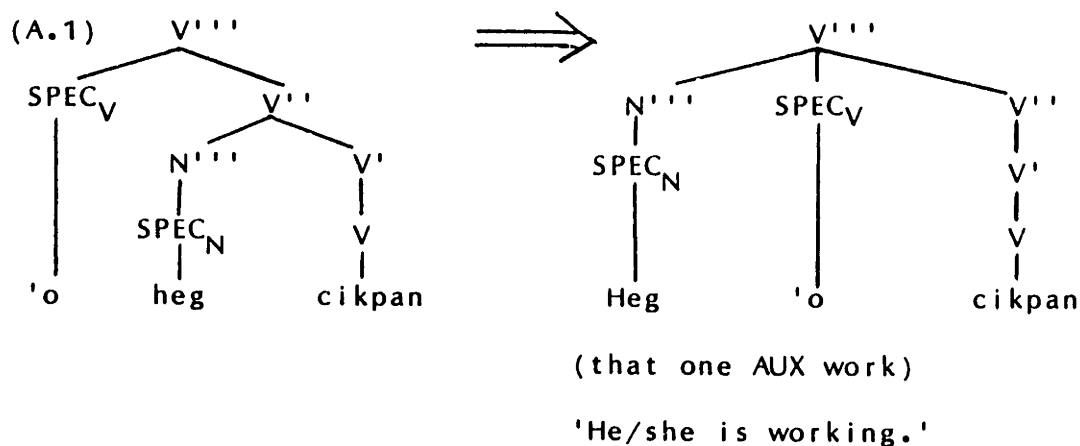
There are likewise two possibilities to expand V' of (35.b).



Structure (36.a) represents preverbal particles like pi or 'am preceding the verb in a sentence.

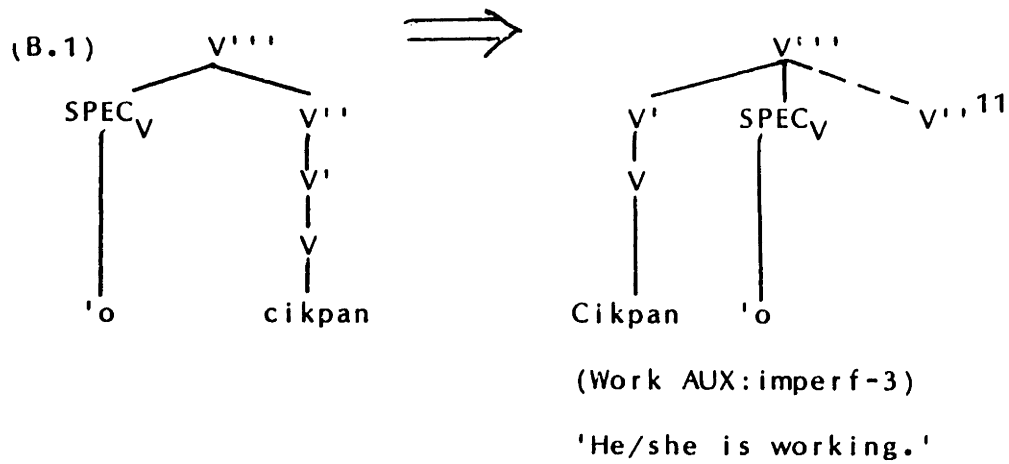
The structures (34)-(36) represent all possible structures involved in the AUX-second requirement: only the leftmost daughter of V'' , or subconstituents of that leftmost daughter to be specified below, may precede AUX in surface structure. These possibilities may be divided into two groups, both concerning the leftmost daughter of V'' .

A. $[-V]'''$. When the leftmost daughter of V'' is $[-V]'''$, AUX ends up between $[-V]'''$ and the rightnext daughter of V'' .

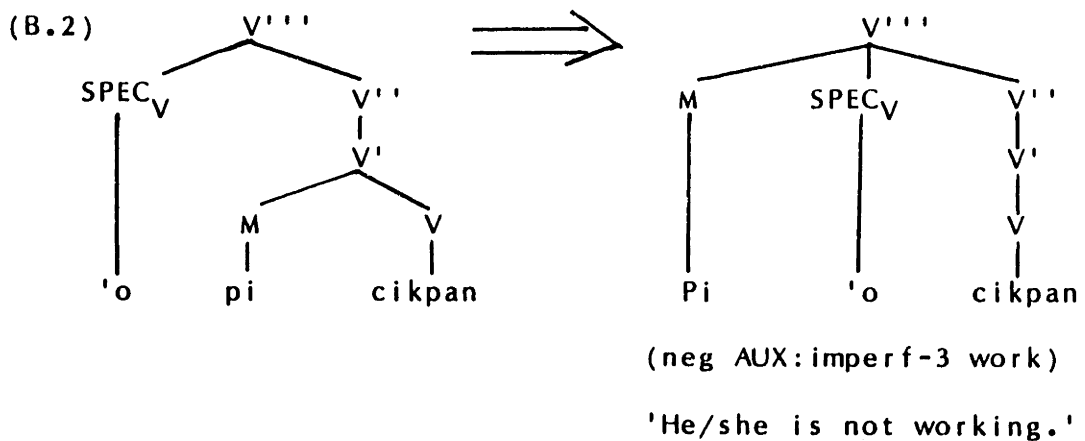


The first part of the AUX rule, stated informally here, moves $[-V]'''$ leftward over AUX into sentence-initial position.

B. V' -- leftmost daughter. When the leftmost daughter of V'' is V' , the leftmost daughter of this V' moves leftward over AUX into initial position.¹⁰ This part of the informal statement of the AUX rule accounts both for instances when the leftmost daughter of V' is V , as below.

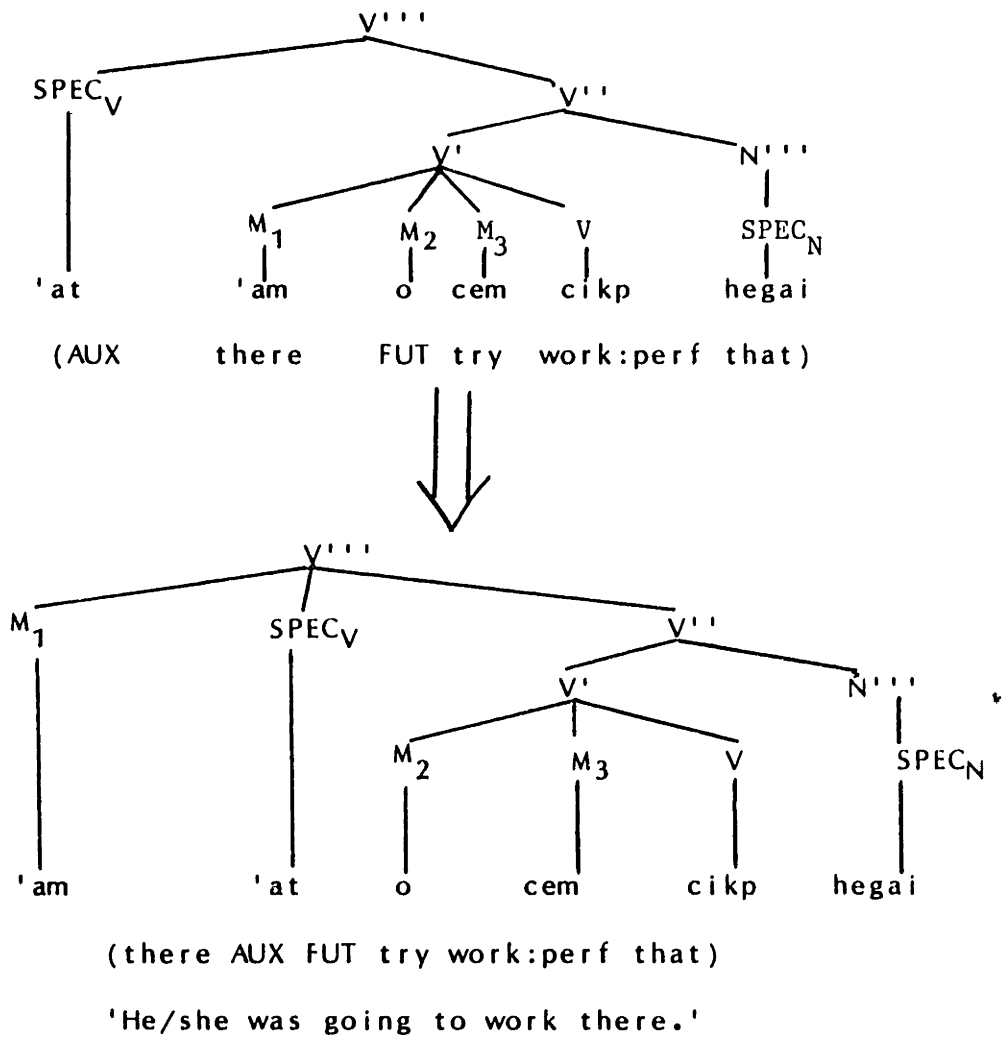


and also for occasions where the leftmost daughter of V' is an M_V , i.e., a preverbal particle:

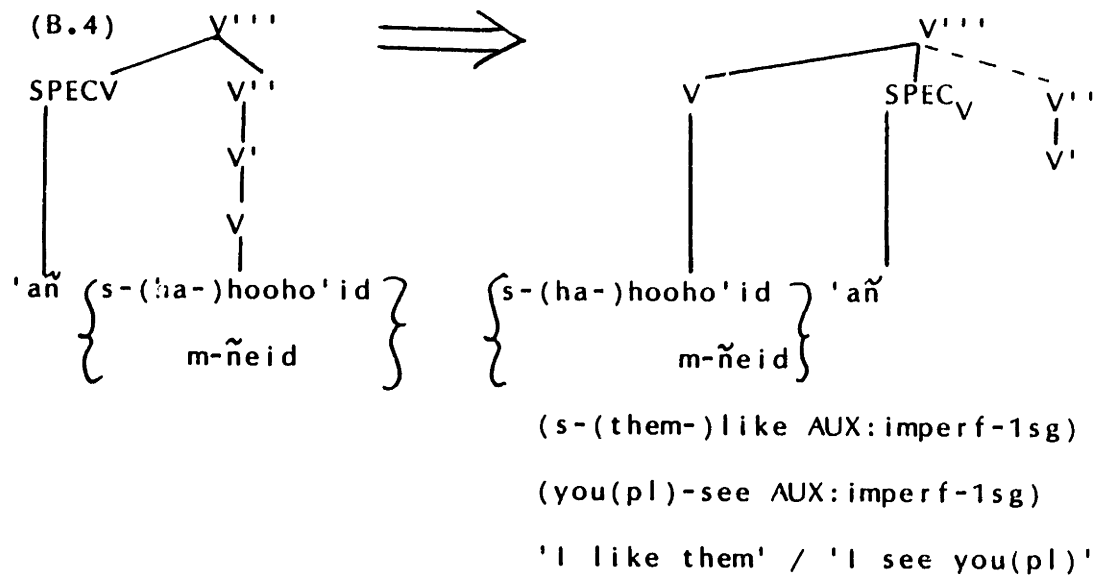


When there is more than one prenuclear particle under V' (cf. (30) for a full list of the members and relative positions of prenuclear V' items), only the leftmost item moves leftward over AUX.

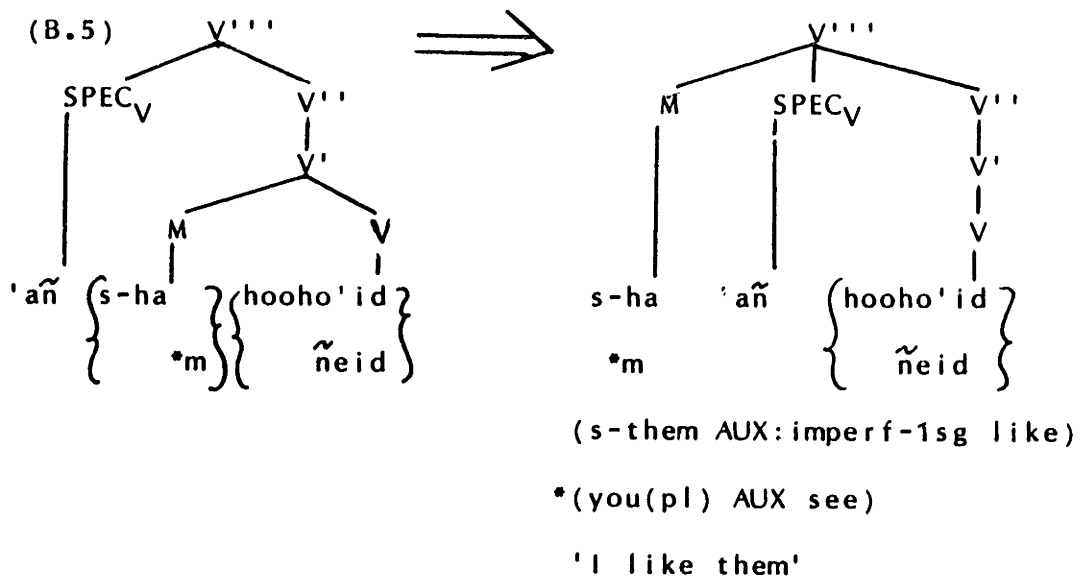
(B.3)



When prefixes are attached to V, and V is the leftmost daughter of V' , the (prefixed) V moves leftward:

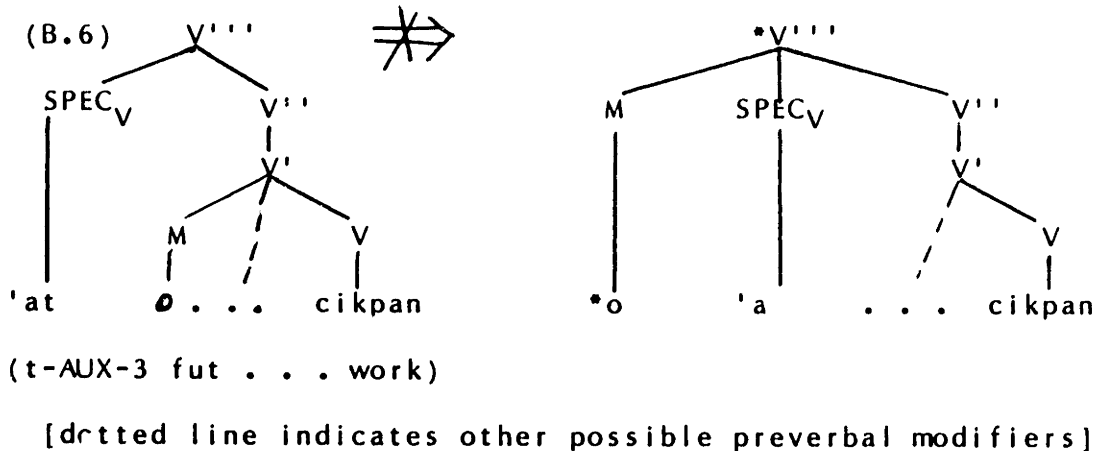


If optional prefixes remain independent, as members of M they only move leftward over AUX if they are the leftmost M:



Because s- is an obligatory prefix object, it cannot be separated from V, while optionally prefixing ha can be so separated.

Recall that the future particle o does not appear to the left of AUX in surface structure. On this analysis, when the leftmost daughter of branching V' is o, leftward movement is blocked.



This constraint on the movement of o must be stipulated in the AUX rule to be defined shortly.

The fact that prefixed AUX remains sentence-initial can be explained by limiting the leftward movement of an item over AUX to movement over a sentence-initial AUX only.



Since the motivation for the AUX rule is to obey the second position requirement on AUX, (i.e., the requirement that AUX cannot surface in sentence-initial position), if AUX is already second, the rule becomes unnecessary. In a sense that is the case with prefixed AUX, where the prefix fills initial position, leaving AUX second.

The algorithm for moving an element leftward over AUX to insure that AUX is in sentential second position is defined below as the "AUX rule" ('##' indicates sentence-boundary):

<u>AUX rule:</u>	##	AUX	X	Y	
		1	2	3	\Rightarrow
	2	1	0	3	

Conditions:

- a. $Y = [-V''']$ or leftmost daughter of V'
- b. $Y \neq \underline{o}$ (future)

The AUX rule, together with the phrase structure schemata of (24), provides a syntactic analysis on which to base the examination of imperative constructions in Papago, in the next section. I will discuss this rule again in detail in 3.1 below, in connection with question word allomorphy, and will make a revision at that point.

2.1.1 The syntax of imperative AUX. Having established the phrase structure schemata of (24) together with the AUX rule as the syntactic basis for the surface form of Papago sentences, I turn to the imperative construction. Here I will show that imperative AUX g, like the nonimperative AUXes discussed earlier, appears in sentential second position, and furthermore, exhibits the same "variability" of second position regarding prefixed and nonprefixed pronominal objects as other AUXes. However, unlike nonimperative sentences beginning with the (grammatical) string V AUX ..., the imperative AUX g cannot follow a sentence-initial imperative verb. Instead, a special "merged" form, analyzed here as the "inflected" allomorph of the imperative verb, replaces the V_{imp} AUX_{imp} . . . sequence.

Imperative sentences in Papago exhibit a curious morphological idiosyncrasy concerning the allomorphy of both imperative verb stems and imperative AUX morphemes, depending on the position of these items. The imperative AUX (hereafter 'impAUX'), like other instances of AUX, is second in the sentence. (ImpAUX g is formally identical to the article g we have already seen.)

- (38) a. 'aapi g cikpanl¹²
 (You impAUX work:imp)
 '(You) work!'
- b. 'aapi g huugĩ g muuñl
 (You impAUX eat:imp art beans)
 'Eat the beans!'

- c. Muuñ g huugĩ ('aapi)!
 (Beans impAUX eat:imp (you))
 'Eat the beans!'
- d. 'aapi g g muuñ huugĩ!
 (You impAUX art beans eat:imp)
 'Eat the beans!'

As with nonimperative cases, the presence of particles -- since they occur obligatorily in pre-verbal position -- blocks verb-initial imperatives.

- (39) a. 'aapi g pi cikpan!
 (You impAUX neg work:imp)
 'Don't work!'
- b. Pi g cikpan ('aapi)!
 (Neg impAUX work:imp (you))
 'Don't work!'
- c. 'aapi g pi 'am-hu cikpan
 (You impAUX neg there work:imp)
 'Don't work there!'
- d. Pi g 'am-hu cikpan ('aapi)!
 (Neg impAUX there work:imp (you))
 'Don't work there!'

Verb-initial strings, impossible as they are in (39) due to the presence of the particles, were also omitted from (38), because they constitute a curious gap

in the 'AUX second' regularity seen above. Where in (38) we expect the verb followed by g,

- (40) a. *Cikpan g ('aapi)l
(Work:imp impAUX (you))
- b. *Huugi g ('aapi) g muuñl
(Eat:imp impAUX (you) art beans)

we find instead the inflected forms

- (41) a. Cikpanañ ('aapi)l¹³
(Work:imp-n (you))
'Work!'
- b. Hugiñ ('aapi) g muuñ
(Eat:imp-n (you) art beans)
'Eat the beans!'

(where g in (41.b) is clearly the article, not the impAUX). Because of the fixed position of pi or 'am relative to the verb, this gap in the impAUX paradigm is not evident in (39), since a verb-initial string is ungrammatical on independent grounds. However, whenever such independent principles do not preclude a verb-initial imperative, only the inflected form represented in (41) is possible. No separate, identifiable AUX appears in verb-initial imperatives.

The fact that it is the initial position of the verb which provokes the inflected allomorph of the imperative verb is demonstrated by the contrast in (42), involving simple verbs and verbs with items prefixed to them. When the optional prefixation of an object pronoun like ha does not take place, and AUX moves to the right of just that pronoun and not a prefixed-verb, the regular imperative AUX appears in second position:

- (42) a. Ha-g !uugi[~] ('aapi)!
 (them-impAUX eat:imp)
 'Eat them!'
- b. 'E-g ñuukud![~]
 (Self-impAUX care:imp)
 'Take care of yourself!'

It is only when AUX follows an prefixed verb (i.e., when prefixation of ha, etc., has taken place) that AUX disappears and the inflected verb form is found instead.

- (43) a. Ha-hugiñ ('aapi)!
 (Them-eat:imp-n (you))
 'Eat them!'

- b. 'E-ñuu!udañ!
 (Self-care:imp-n)
 'Take care of yourself!'

Notice that the obligatorily prefixes like pronominal ñ- 'me' cannot exhibit this variation:

- (44) a. Ñ-ñuukudañ!
 (me-care:imp-n)
 'Take care of me!'
 b. *Ñ g ñuukud!
 (me impAUX care:imp)

In the case of the 'inflected imperative AUX', then, inflection is intricately -- and directly -- bound to the syntactic position of the verb. In order to maintain the assertions about the base-generation and subsequent "movement" over AUX outlined above, the following dilemma must be resolved: According to the analysis of AUX offered above, a verb-initial string is established by move- rules, because of the requirement that AUX must be second. This means that the allomorphy of imperative V and AUX required for a particular sentence (either g ... V or the inflected form) cannot be decided until after the move- α rules have moved an item leftward so that AUX is in second position. This movement fixes the word order, identifying the item that occupies first position as a verb or not, and thus, determining the appropriate allomorph for the imperative. Since on the traditional view lexical insertion precedes the move- α

processes, lexical insertion must occur before the final surface word order is established. And the appropriate allomorph of the imperative AUX must be introduced into the sentence during lexical insertion, that is, before the context for a particular AUX allomorph is defined.

The contradiction may be resolved in one of two ways, assuming the syntactic analysis and our notions of lexical insertion and word formation to be correct: either an allomorph is inserted freely and, if it turns out to be the wrong one for the context, the sentence is ruled out by some kind of surface filter, or there is recourse to the lexicon after "lexical insertion", when the word order is finally set, in order to obtain from the lexicon the correct form of the imperative AUX. The latter alternative will be pursued here. Before proposing the mechanism which will allow recourse to the lexicon, however, I will examine the morphology of imperative verbs more closely.

2.1.2 Morphology of imperative verbs. I will show in this section that the inflected imperative verb form is composed of a particular stem of that verb, to which is suffixed the morpheme /-ni/ (phonetic [-ñ]); hereafter I will cite the surface form), yielding, e.g., cikpanañ.¹⁴ The stem to which [ñ] attaches is a productive stem that combines with many other suffixes. Next I will consider bare imperative stems, noting that while the two imperative forms seem to be based on the same stem, they are distinct items and not to be linked by a simple word formation rule stating that the "inflected" imperative is formed by the suffixation of [-ñ] to the bare imperative. I will then contrast the inflected

and bare imperative forms. My purpose will be to discover if the formation of imperative verb forms should be considered part of the regular word formation processes of the lexicon, independent of the syntax. (By "formation" I mean the determination of the morphophonological character of these forms.) Concluding that the morphophonological shape of both imperative alternants is indeed formed by word formation processes independently motivated as lexical, I will argue for a syntactic analysis which allows the phonological matrices of both types of imperatives to come "fully formed" from the lexicon, under conditions to be specified below. The notion underlying this section is that the phonological realization of a word, including its morphological substructure, is independent of the syntactic process of merger (to be discussed in detail below). During that discussion I will return to this point.

Many verb classes alternates systematically between two stems, each stem associated with distinct affixes. The stem /mera/ (phonetic [meḡ(a)]) 'run' alternates with /meri/ ([mel(i)]) in combination with the suffixes listed respectively in each column of (45). For clarity of exposition, suffixes are separated from their verb stems by hyphens. I give underlying stems first, and underneath them, the surface forms of derived words built on each respective stem.

- | | |
|------------------------|------------------------|
| (45) a. /mera/ | b. /meri/ |
| meḡa-d (durative) | meli-m (desiderative) |
| meḡ-k (conjoined) | mel[i]-cud (causative) |
| meḡ-ka'i (immediative) | meli-ŋ (imperative) |

Hale (1970) proposes that ɖ/l (represented here as underlying $/r/$) are in complementary distribution preceding [+back] and [-back] vowels, respectively. In the case of $/\text{mera}/-/\text{meri}/$, therefore, it is easy to see which of the possible stems a particular suffix is attached to, even if the final vowel of the stem is deleted during the derivation, cf. med-k .

It is clear that the vowels in question are part of the stem and not part of the suffix because the suffixes on $/\text{meri}/$ in (45) also appear consistently on $/a/-\text{final } /tikapana/$:¹⁵

(46) $/tikapana/$

- | | |
|-------------------------------|--------------------------------|
| a. cikpana-d (dur.) | b. cikpana-m (desid.) |
| cikpan-k (conj.) | cikpana-cud (caus.) |
| cikpan-ka'i (immed.) | cikpana-ñ (imper.) |

By concluding that the suffixes of (45.b) and (46.b) are attached to $/\text{meri}/$ and $/tikapana/$ respectively, we can postulate a single set of suffixes, rather than the putative pairs $*-\underline{\text{im}}$, $*-\underline{\text{am}}$, etc., which we would be forced to say if we took $*/\text{meC}/$ (with allophones ɖ/l to replace C before $/a/$, $/i/$ respectively) and $*/tikapan/$ as the underlying stems. I assume, then, that $/\text{mera}/$ and $/\text{meri}/$ are distinct stems.

The suffixes seen in (47) are divided into the same two groups in association with $/hima/-/himi/$ 'to walk':

- | | | |
|---------|-------------------|---------------------|
| (47) a. | /hima/ | b./himi/ |
| | hima-d (dur.) | himi-m (desid.) |
| | him-k (conj.) | him[i̯]-cud (caus.) |
| | him-ka'i (immed.) | himi-ñ (imper.) |

The hima-d/himi-m contrast gives strong evidence supporting a two-stem analysis of this verb, and I adopt that position here.

Other examples of dual stem verbs are

- | | | |
|---------|-------------------------|----------------------|
| (48) a. | /behe/ 'to get sg obj.' | b. /behi/ |
| | behe-d (dur.) | behi-m (desid.) |
| | behě-k (conj.) | behĩ-cug (andative.) |
| | behě-ka'i (immed.) | behi-ñ (imper.) |
-
- | | | |
|---------|--------------------|--------------------------|
| (49) a. | /da'a/ 'to fly' | b. /da'i/ |
| | da'a-d (dur.) | da'i-m (desid.) |
| | da'ǎ-k (conjoined) | da'ĩ-cud 'to throw obj.' |
| | da'ǎ-ka'i (immed.) | da'i-ñ (imper.) |

In contrast to the dual stems verb classes, verbs like cikpan have a single stem to which suffixes attach. The paradigm of the stem /hi'a/ 'to urinate' in (50), along with that of /tikapana/ in (46), shows that both those suffixes which attach to the (a) stems of (45), (48) - (50) and those which attach to the (b) stems attach to a single stem for these verbs.

- (50) /hi'a/
- | | | | |
|----|--------------------|----|------------------|
| a. | hi'a-d (dur.) | b. | hi'a-m (desid.) |
| | hi'ǎ-k (conj.) | | hi'ǎ-cud (caus.) |
| | hi'ǎ-ka'i (immed.) | | hi'a-ǎ (imper.) |

The imperative suffix [-ǎ], which is found consistently on inflected imperative verbs, attaches to verbal stems that are generally productive in word formation, and I therefore conclude that the formation of the inflected imperative takes place in the lexicon with other suffixation processes. The data given here suggest that when two stems are available, [-ǎ] gets attached to the /-i/ variant, cf. himi-ǎ, meli-ǎ (*himaǎ, *medaǎ). Notice that whenever more than one stem exists for a verb, the stem which receives the imperative AUX suffix must be so designated in the word formation component of the grammar. In Lexical Phonology I assume this would be by subcategorization of [-ǎ] for a [+ /-i/- alternant] stem, where that stem is available for a given verb.

The bare imperative differs substantially from its inflected counterpart. Not only is there no [-ǎ], but in many cases other phonological differences are apparent (e.g., lengthened vowels, or inserted glottal stops, cf. (51)). Listed in (51) are bare-inflected pairs for the verbs examined above.

(51)	<u>bare</u>	<u>inflected</u>
	meel	meli- [~]
	hiimi [~]	himi- [~]
	bee'i	behi- [~]
	daa'i	da'i- [~]
	cikpan	cikpana- [~]
	hia'i	hi'a- [~]

While the first two bare forms meel and hiimi[~] suggest that bare imperatives are constructed from -- or are at least phonologically closer to -- the stem underlying the inflected imperative than to any other stem of the paradigm, it is not the case that the so-called bare imperative is simply the imperative stem (-/i/ or otherwise) to which [-[~]] is attached to form the inflected imperative. Instead, the bare imperative is an independent member of the verbal paradigm not transparently related to its inflected partner.

It is difficult to predict the specific form a bare imperative will have, although general tendencies within certain verb classes can be identified. For example, members of the CV(L)V verbal class (to be discussed below in greater detail), where L is a laryngeal, tend to form the bare imperative by deleting the laryngeal and adding -i to the laryngeal-less stem, as in /hi'a/, which has the bare imperative form hia'i shown in (51). But this pattern cannot predict that the bare imperative for /kuhu/ is kuhu and not the *kuu'i that might be expected. In the absence of evidence to the contrary I assume that the two

imperatives have a common stem, although I will not delve into the actual derivation of bare stems in this dissertation.

Having established the formation (i.e., morphophonological realization) of the inflected imperative verb as one of the lexical word formation processes, I turn now to a consideration of the syntactic nature of inflected and bare imperative alternations. I will argue that merger is the syntactic source of inflected imperative verbs in Papago.

2.1.3 The merger proposal. Of the combinations of imperative verbs and imperative AUXes in (52),

- (52) a. . . . g . . . hiimĩ̃ . . .
 b. Himi-ñ̃ . . .
 c. *Himi-ñ̃ g . . .
 d. *. . . g . . . himi-ñ̃ . . .
 e. *Hiimĩ̃ g . . .

only the first two are grammatical. Sentences displaying the patterns (52.c) and (52.d) will be ruled out below by an operation of merger whereby the [V-AUX] merged form of the imperative, e.g., himiñ̃, appears in place of an initial V AUX sequence like *Hiimĩ̃ g. The fact that himiñ̃ appears instead of its bare verb + AUX counterpart will prohibit the co-occurrence of [-ñ̃] and g in

(52.c). Sentence type (52.d) will be ruled out because hiimĩ is not initial as it is required to be.

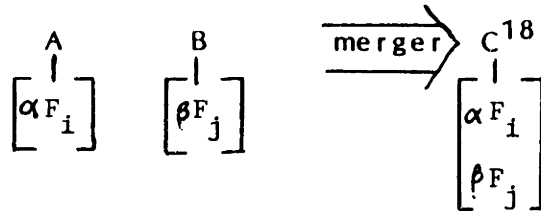
We may ask, however, why (52.e) is ungrammatical. Syntactically it is interpretable; after all, g and hiimĩ are in combination in (52.a), and as we saw earlier, other instances of (nonimperative) . . . AUX . . . V . . . strings can be permuted to V AUX . . ., cf. (1.a) - (2.a) repeated below:

- (1) a. Huan 'o cikpan
(John AUX:imperf-3 work:imperf)
- (2) a. Cikpan 'o g Huan
(Work:imperf AUX:imperf-3 art John)
'John is working'

Another way to put the question is this: why must a verb and a following AUX in the imperative mood be merged into the inflected imperative form?

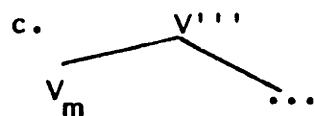
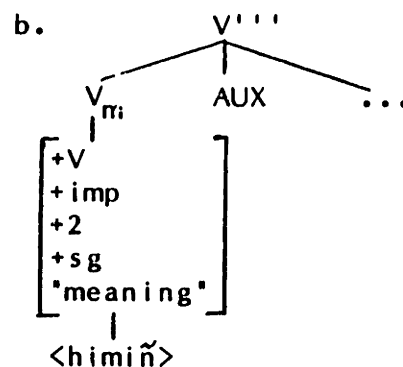
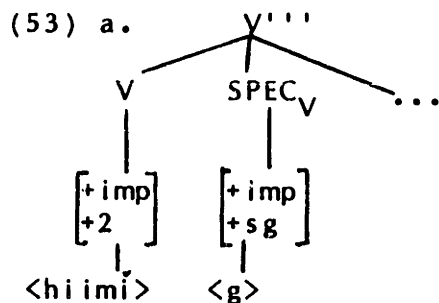
I will account for the ungrammaticality of sentences like *Hiimĩ g ... within the grammar under development here by the operation merger.¹⁶ Merger is a process whereby the gf-bundle which constitutes only the grammatical properties of a lexical item (and not its phonological shape) is integrated into the gf-bundle of a second lexical item (again minus phonological material). Merger creates a new (composite) gf-bundle¹⁷ (which is later matched during PI to the

phonological shape that corresponds to it from the lexicon). Merger is roughly schematized below:



where A, B, and C are variables representing the grammatical categories of the elements involved in merger, and ' α_F ' represents the gf-bundle of the lexical item. The fact that merger involves only gf-bundles, and no phonological information, follows from the organization of the grammar. Because merger occurs at s-structure, prior to PI, no phonological information is available to merger.

As an illustration, let us consider the merger rule for Papago imperatives. Merger combines an AUX bearing the feature [+imperative] to a preceding verb (which also contains the [+imp] feature), as pictured below with the verb hiimi 'to walk'.



The newly merged verb, marked V_m in (53.b) for clarity, contains a composite gf-bundle that includes the grammatical features of V , plus those of AUX , listed in (53.a). I assume that the kind of percolation convention described in Lieber (1980) assures that V_m is associated with all the features of its daughters.

Both the bare imperative form (hiimi) and its inflected counterpart (himiñ) are produced by the word formation component of the lexicon, in accordance with the word formation processes I discussed in Chapter 1. Each has a different gf-bundle associated with it; the result of merger in (53) is the complex gf-bundle listed in (53.b), whose phonological shape is the inflected form [himiñ]. I am claiming that while both forms are verbs, and both are available from the lexicon, they enter the sentence under different syntactic configurations. Merger puts together gf-bundles in the syntax; the lexicon provides the phonological realization of these new syntactic combinations.

Any node in the tree lacking a gf-bundle after s-structure, like AUX in (53.b), cannot be associated with a phonological matrix. In fact, I assume that nodes of the tree exist only insofar as they are realizations of the categorial information of lexical items. That is, the nodes do not exist apart from gf-bundles, since phrase structure is projected from the lexicon. Any node which "loses" its gf-bundle, as AUX has through merger in (53.b), ceases to exist within the phrase structure of the sentence. Sentence (53.b) therefore is included in the example simply as a graphic illustration of the merger process which I take to alter the string in (53.a) ultimately to that in (53.c). This assumption means that for Papago, whenever AUX merges into V , the usual imperative AUX g cannot

be realized, since its gf-bundle is no longer intact under the AUX node, and as (53.c) shows, the AUX node itself disappears. From the assumption that phrasal nodes are projections of lexical properties, then, it follows that a string containing both g and an inflected imperative is ill-formed: the inflected imperative arises only from merger, which robs AUX of its gf-bundle, and by extension, of its entire existence in the sentence.

Each language specifies which constituents can merge together, and whether the merging in a particular instance is obligatory or optional. I envision 'merger rules' which list ordered pairs of 'merge-able' constituents. The ordering of the pair describes the linear adjacency required at the point of application of merger, i.e., s-structure, in order for merger to occur. For example, the grammar of Papago contains the merger rule (54) for imperatives:

(54) (V_[+imp], AUX_[+imp]) OBLIG

Only when an imperative verb is followed by an imperative AUX will merger occur, and in that situation, merger is obligatory.¹⁹ The syntax of Papago insures that V will only be followed by AUX when V is initial, and AUX is second, in the sentence; hence nothing need be stated about sentence-initial imperatives undergoing merger.

The imperative merger rule reflects the general nature of the merger process for Papago imperatives: all occurrences of imperative verbs followed by imperative AUXes merge. In the discussion of Irish verbal inflection in section

2.2.1 below, I will contrast (54) with merger rules that are quite specific and name individual lexical items, conforming to the intuition that, in those cases, merger is an idiosyncratic process in the language.

The directionality of merger, in the sense of which constituent's category dominates the other (i.e., the Papago case results in an inflected verb, not a verbalized AUX), derives from general hierarchical relationships. For example, in merger involving a governor and a governed item, the category of the governor is the category of the merged node, as we will see in 2.2 below. In similar fashion, when a specifier and head merge, the category of the head dominates, as in Papago imperatives. I will return to this question in the discussion of Papago conjunction in 2.3.2 below.

Constraints on which kinds of items can merge vary from language to language. A general observation about the examples of merger examined here is that specific grammatical relations obtain between the two merging items. These relations include "Specifier of X" for Papago imperatives, "Subject of X" and "Object of X" for the Irish data in 2.2, and what I will characterize as "head of the left conjunct of X" for Papago conjunction data in 2.3. (This last label will be explicated in 2.3.) I take the position that a characteristic of the merger relationship is that the merging items must share some sort of grammatical relation. This aspect of merger will be contrasted with the corresponding property of fusion in Chapter 4.

The merger process described above is similar to the notion of "merger" in Marantz (1981). In fact, I understand merger here as one example of the kind of merger Marantz describes. I will not repeat his arguments here; the reader is referred to his dissertation. In brief, Marantz allows merger between many levels in the grammar, the underlying principle being that items which must have independent status at one point in the grammar, for purposes of some grammatical principle e.g., binding conditions or case assignment, may "merge" into a single lexical item at a (later) point. For example, Japanese causative constructions are understood to contain a root verb and an independent matrix causative verb at syntactic structure, which "merge" into a single lexical item at surface structure. This notion is very similar in spirit to the merger proposal articulated here.

However, as I remarked about Anderson's model in Chapter 1, Marantz's model is conceptually distinct from the present merger proposal. He assumes, contrary to the notion of CC stated here, that the phrase structure rules generate structures into which lexical items are inserted. There is no clear distinction between CC and PI on his model. Thus the problem of positional allomorphy, to be discussed in Chapter 3, remains a problem for his model, in much the same way that it represents a difficulty for the traditional model of grammar incorporating lexical insertion that was modified into the merger model in Chapter 1.

The traditional notions of lexical insertion described in Chapter 1 are not adequate to account for the Papago data. The assumption that lexical insertion -- including the insertion of phonological material -- places lexical items in phrase

structures before the transformational component begins to operate is incompatible with the syntactic analysis of AUX and the morphological intricacies of the imperatives reviewed here. According to this traditional assumption, lexical insertion would have to place into d-structure items whose allomorphy could not be determined at the d-structure stage of derivation. A single example will illustrate the problem.

Consider the following semantically identical variants of the Papago imperative glossed as 'Get the gun!':

- (55) a. 'aapi g bee'i g gawos!
 (you impAUX get:imp art gun)
- b. Behiñ 'aapi g gawos!
 (get:imp-n you art gun)
 'Get the gun!'

The d-structure underlying both examples of (55) (I assume the two are related, but distinct realizations of the extraposition option that produces constituent "scrambling" effects in Papago) is the string (56) (ignoring irrelevant details), since extraposition would not have occurred yet if lexical insertion were to take place into d-structure before the syntactic processes.

- (56) [AUX N''' N''' V']_{V'''}

It is unclear at the (56) stage of derivation exactly which AUX and which form of V to insert. In fact, it cannot even be predicted if V will ever end up initial, since that depends first on extraposition and then on the AUX rule. Even if g is automatically inserted in the AUX slot, and then filtered out if incorrect, the problem with the correct choice of V still exists. If extraposition occurs, leaving V next to AUX (as it has, apparently, in (55.b)), the appropriate form of V will still not be determined until the AUX rule applies and one of the phrasal constituents (V in (55.b), N in (55.a)) moves into initial position. Yet lexical insertion is held to occur at the derivation stage represented in (56). The only way to retain the notion of lexical insertion into d-structure for these sentences, and to generate grammatical sentences at the same time, it seems to me, is to resort to a filter analysis wherein any string could be generated, and a filter would simply reject ungrammatical combinations. This type of filter gives little insight into the processes which generate grammatical sentences. The merger proposal, on the other hand, allows only the grammatical strings to arise in the first place, because it offers a principled source for each verb form.

It could be argued that the problem of choosing correct forms like bee'i and behĩĩ would also be resolved by allowing the traditional kind of lexical insertion to occur at surface structure.²⁰ The syntax could then move around abstract markers, rather than the gf-bundles of the two-part lexical insertion process under discussion, and a single occurrence of the lexical insertion process could replace these abstract markers with entire lexical items, including phonological features. This proposal might in fact be a notational variant of the separation of traditional lexical insertion into CC and PI, as I advocate. It

seems to me, however, that using the gf-bundles (which actually constitute part of the feature matrix of the lexical item) in d-structure, rather than "abstract markers", which must in any case be replaced by these gf-bundles, is preferable.

I have concluded that the formation of the phonological realization of the inflected imperative is the result of a regular process of suffixation attaching /-ni/ to a particular stem of a verb, and that the building of this 'inflected form occurs in the word-formation component of the lexicon. The bare imperative has been analyzed as an independent stem of that verb, presumably formed by word formation processes left unconsidered here. The merging together of a verb with the imperative AUX occurs when these two are adjacent at s-structure; such merging is stipulated as obligatory by the grammar of Papago. Merging accounts for the otherwise inexplicable departures from what can be considered the regular syntactic processes of the language.

In the next section I consider inflection in Irish. I will again argue for merger; in this instance it is the operation which yields the morphological peculiarities associated with pronouns in the three Irish constructions I will examine.

2.2 Person-number inflection in Modern Irish. Person-number inflection in Modern Irish marks verbs for their subjects, and extends also to both the marking of prepositions regarding their objects, and the marking of genitive nouns with respect to a pronominal possessor. I will discuss all three types of inflection,

basing my remarks on the exposition of the data in McCloskey and Hale (1983). I will then offer a somewhat different analysis of the facts, drawing a parallel between Irish inflection and the Papago imperative allomorphy considered in section 2.1 above.²¹ The Irish data will provide additional support for the theory of merger introduced at the end of the last section. I turn first to verbal inflection.

2.2.1 Verbal inflection. Verbal paradigms contain two types of forms: 'synthetic' or inflected forms encoding the person-number features of the subject, and an 'analytic' form which is unmarked for person and number features of the subject (although it is inflected for tense and mood). The synthetic and analytic forms are generally in complementary distribution within a paradigm; however, occasional doublets do crop up. I will return to these doublets below. The present tense paradigm for the verb cuir 'to put' in the Ulster dialect is given below; I will confine my examples to Ulster, unless otherwise noted.

((57)	<u>singular</u>	<u>plural</u>
1	cuirim	cuireann muid
2	cuireann tú	cuireann sibh
M3	cuireann sé	cuireann siad
F3	cuireann sí	

Third person gender distinctions are not marked in the plural. The present paradigm of cuir contains only one synthetic form: first person singular; all

the other present tense forms are a combination of the analytic form cuireann together with the independent pronoun corresponding to the subject. In comparison, the conditional paradigm for the same verb is somewhat richer in synthetic forms.

(58)	<u>singular</u>	<u>plural</u>
1	chuirfinn	chuirfimis
2	chuirfeá	chuirfeadh sibh
M3	chuirfeadh sé	chuirfeadh siad
F3	chuirfeadh sí	

In the conditional mood both first persons, and second person singular, have synthetic forms. The gaps in the paradigm are once again filled by the analytic form, here chuirfeadh, in combination with the appropriate independent pronoun. The analytic form + pronoun strategy is used whenever the morphology does not provide synthetic forms.

The analytic form is used also with nonpronominal lexical NP subjects as in (59), taken from McCloskey and Hale [(1983); hereafter MH].

- (59) a. Chuirfeadh Eoghan isteach ar an phost sin.
 (put:COND Owen in on the job that)
 'Owen would apply for that job.'

- b. Chuirfeadh na léachtóirí uilig isteach ar an phost sin.
 (put:COND the lecturers all in on the job that)
 'All the lecturers would apply for that job.'

All trace subjects, even if their antecedents are pronouns for which a synthetic form is available in a paradigm, also require the analytic form of the verb.

- (60) Mise a chuirfeadh t isteach ar an phost sin
 (me:CONTRASTIVE COMP put:COND t in on the job that)
 'It's me that would apply for that job.'

Normally the verb cuir uses a synthetic form for a first-person singular subject: chuirfinn. However, in clefted (60), the trace subject is paired with analytic chuirfeadh, and chuirfinn would be incorrect here.

Synthetic verb forms are incompatible with overt expression of a pronominal subject:

- (61) a. *Chuirfinn mé isteach ar an phost sin.
 (put:COND:1sg I in on the job that)
 'I would apply for that job.'
- b. Chuirfinn isteach ar an phost sin.
 (put:COND:1sg I in on the job that)
 'I would apply for that job.'

That is, inflection on the verb and an independent subject pronoun are mutually exclusive. Another way to state this is that Irish allows only one overt expression of the subject per sentence, either as an inflection on the verb, or, where that strategy is not available from the morphology, as an independent pronoun coupled with the analytic verb form. No paradigm is entirely synthetic, although dialects differ as to the paucity of synthetic forms within a given paradigm.

MH give abundant evidence which suggests that the grammatical properties of the subject in sentences containing synthetic verb forms, and those of an independent pronominal subject, are identical. I will review the evidence briefly here; I refer the reader to their paper for details. First, MH point out that several suffixal or enclitic elements which attach to independent pronouns are also found in sentences where the subject is identified by the inflection on the synthetic verb form. For example, féin follows a pronoun to form a reflexive or emphatic pronoun. Thus, mé 'I, me' --> mé féin 'myself'; sé 'he' --> sé féin 'himself, nom.' and é 'him' --> é féin 'himself, accus.' Féin appears not only in sentences containing independent pronominal subjects, but also following the inflection of a synthetic verb form.

- (62) a. Chuir mé isteach ar an phost sin.
 (put:PAST I in on the job that)
 'I applied for that job.'

- b. Chuir mé féin isteach ar an phost sin.
 (put:PAST I REFLEX in on the job that)
 'I myself applied for that job.'
- c. Chuirfinn isteach ar an phost sin.
 (put:COND:1sg in on the job that)
 'I would apply for that job.'
- d. Chuirfinn féin isteach ar an phost sin.
 (put:COND:1sg REFLEX in on the job that)
 'I myself would apply for that job.'

In the same way demonstrative particles that turn third person pronouns into demonstrative pronouns co-occur both with overt pronouns and synthetic forms inflected for third person.

seo 'proximate'	sé seo 'this (nom.)'
	siad seo 'these, (nom.)'
sin 'distal'	iad sin 'those (accus.)'
siúd 'ultra-distal'	é siúd 'that yonder one(accum.)'

- (63) a. Cuirfidh siad seo isteach ar an phost sin.
 (put:FUT they DEMON in on the job that)
 'These ones will apply for that job.'

- b. Chuireadar isteach ar an phost sin.
(put:PAST:3pl in on the job that)
'They applied for that job.'
- c. Chuireadar seo isteach ar an phost sin.
(put:PAST:3pl DEMON in on the job that)
'These ones applied for that job.'

Similarly, suffixes which form contrastive pronouns attach equally to independent pronouns and inflection in synthetic verb forms.

- (64) a. Chuir mise isteach ar an phost sin.
(put:PAST I:CONTRAST in on the job that)
'I applied for that job.'
- b. Chuirfinn-se isteach ar an phost sin.
(put:COND:1sg:CONTRAST in on the job that)
'I would apply for that job.'

A second grammatical property shared by an overt pronominal subject and the subject in a sentence containing a synthetic verb form is the behavior of these subjects in relative clauses. There are two kinds of relative clauses in Irish, roughly described as "direct" relativization involving a "gap" (which MH take to be a trace t) in the position of the relativized NP, and "indirect" relativization, associated with a resumptive pronoun in the site of relativization. Ignoring the syntactic processes which distinguish these two

kinds of relative clauses, we see that the relativization strategy which utilizes an overt pronoun in a given case applies also to parallel cases involving synthetic verb forms. Thus, for purposes of relativization, synthetic verb forms pattern with overt pronouns. Neither post-verbal pronoun nor synthetic form can fill the gap in (65):

- (65) a. *An fear aN raibh sé san otharlann.
 (the man COMP was he in:the hospital)
 'the man that (he) was in the hospital'
- b. *Na daoine aN mbídiís san otharlann
 (the people COMP be:PASTHABIT:3pl in:the hospital)
 'the people that (they) used to be in the hospital'

By the same token, the implied subject of the synthetic form, as well as an overt pronominal subject, can appear as a resumptive pronoun in the indirectly relativized examples in (66).

- (66) a. Daoine nach mbíonn fhios agat an dtiocfaidh siad in am
 (people NEG:COMP is knowledge at:2sg QCOMP come:FUT they
 in time)
 'people that you never know if they will come in time'

- b. Daoine nach raibh fhios againn an dtiocfaidís in am
 (people NEG:COMP was knowledge at:1pl QCOMP
 come:COND:3pl in time)
 'People that we didn't know if they would come in time'

A third instance of common syntactic behavior between overt and non-overt pronominal subjects concerns the coordination of subjects in a sentence. When a synthetic verb form exists for a particular person-number combination of a subject, that synthetic form can be conjoined with a lexical NP:

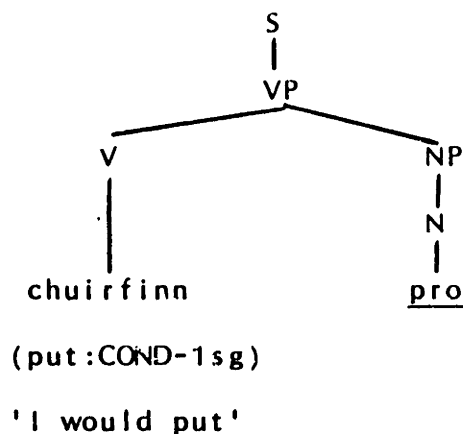
- (67) a. Dá mbeínn-se agus tusa ann ...
 (if be:COND:1sg:CONTRAST and you:CONTRAST there)
 'if you and I were there ...'
- b. Dá rachainn-se nó tusa an bealach ...
 (if go:COND:1sg-CONTRAST or you:CONTRAST the way)
 'if you or I were to go that way ...'

When no synthetic form exists for a specific subject, of course, the analytic form plus overt pronoun is the only available expression, and therefore must appear. The fact that in cases with synthetic forms the verb is inflected only for the person-number features of the left, i.e., nearest, conjunct, is not surprising since as MH point out, the "nearest conjunct only" strategy for subject-verb agreement in subject-conjoined sentences is attested in Classical Latin and Czech.

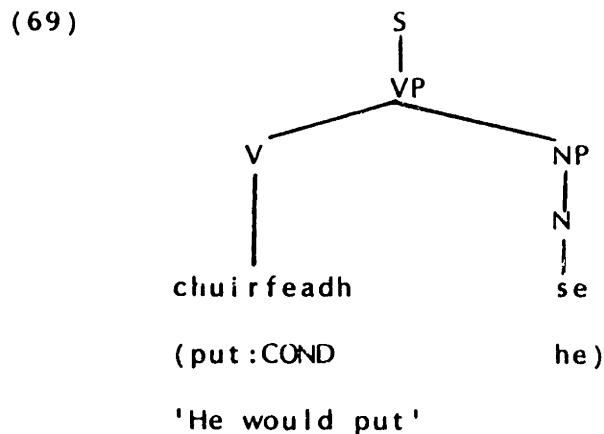
The foregoing data is part of the MH evidence confirming the identical syntactic behavior of overtly-expressed pronominal subjects and the "subjects" in sentences containing synthetic verb forms. MH conclude that the subject of inflected-verb sentences is pro, with which the person-number marking on synthetic verbs agrees. That is, in inflected-verb sentences, a phonologically null pronoun occupies the post-verbal position which in analytic-verb sentences is filled by an overt subject. The inflection on the verb is then an agreement morpheme co-referent with the pro subject.

The "agreement analysis", as MH call it, maintains (consistent with current proposals about word-formation and in particular, inflection) that synthetic verb forms are inserted 'fully-formed under V', together with the pro subjects under N with which these inflected forms agree. This is schematized crudely in (68), for the first-person singular conditional form of cuir 'to put'. Nodes irrelevant to this discussion are ignored.

(68)



Parallel to (68), the analytic form in (69), again of the conditional paradigm of cuir, must be inserted under V, this time accompanied by the independent pronoun that is its subject.



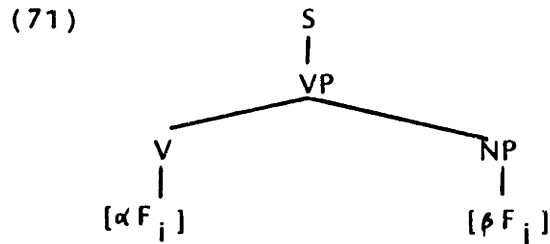
A condition on the distribution of pro [= MH (21)], stated in (70), insures that pro occurs only where some governor, e.g., an inflected head, can supply its person-number features.

- (70) *pro, unless governed by some X
 $\left[\alpha F \right]$
 where αF is an abbreviation for some combination
 of person-number features.

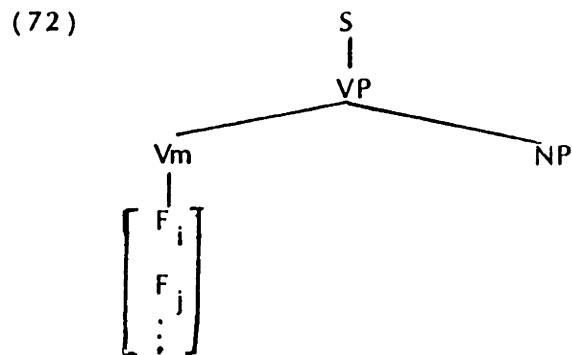
MH suggest that an incorporation analysis might also handle the data suitably. On this analysis, the independent pronominal subject would be absorbed -- incorporated -- into the verb, possibly leaving a trace. Inflection and its overt pronominal counterpart pronoun are then identical: inflection is the

pronoun, folded into the verb. The merger analysis introduced in section 2.1 above is a kind of incorporation model; I turn now to the details of the merger process for Irish.

Merger for Irish verbs combines a verb followed by its pronominal subject into a synthetic verb form. I take the verb followed by an independent subject to be the basic sentence pattern in Irish. This means that the gf-bundles for the verb and for the subject are independent at d-structure. The tree structure in (71) illustrates the d-structure for the fragment representing the first-person singular conditional form of the verb cuir 'to put', containing the gf-bundles corresponding to the two constituents:

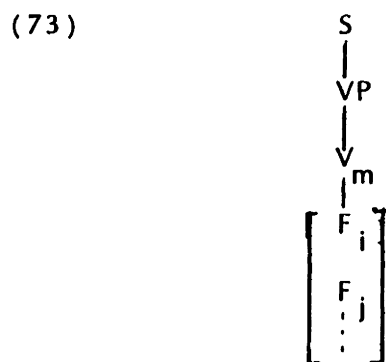


The phonological matrices that would instantiate the items in (71) are ⟨chuirfeadh⟩ and ⟨me⟩ respectively, although of course that information is not yet available at d-structure. Merger brings the two gf-bundles together under V_m :



and the lexicon provides via PI the phonological matrix [chuirfinn] corresponding to the gf-bundle V_m .

As I have already suggested, tree nodes reflect the gf-bundles that are their terminal elements. Because N in (72) has lost its gf-bundle through merger, the node ceases to be part of the tree. The consequence of merger is the tree in (73):



Since the two gf-bundles of N and V from (71) are now combined into a single composite gf-bundle as (73) shows, the sentence no longer contains a gf-bundle that could be exhaustively associated with the phonological matrix of an independent pronoun. Therefore, an ungrammatical string consisting of an inflected verb and an independent subject (*chuirfinn mé) cannot arise, because

the gf-bundle representing a first person singular subject pronoun can either correspond to mé, or is combined with the gf-bundle of the verb in order to form chuirfinn, but not both in a given sentence. The complementary distribution of independent subjects and inflected verbs in Irish is thus explained by the merger proposal.

If, on the other hand, the gf-bundle of a pronominal subject moves by move- to a position no longer rightwardly adjacent to the V (e.g., as in NP-fronting), leaving a trace behind, the linear order condition on merger is violated, and merger between the fronted pronoun and the verb cannot occur. Then the gf-bundle for the pronoun gains its phonological matrix during PI, as does the V, and no inflected form appears. Therefore the adjacency condition on merger explains why in clefted sentences, relative clauses, etc., where the gf-bundle of the pronoun does not immediately follow the gf-bundle of the verb, the verb is always in its analytic form, even if a synthetic form for that particular V-N combination exists (cf. (82)). To put this another way, merger explains why the analytic verb form always co-occurs with a trace of the NP subject.

On the merger proposal, the fact that verbs merge with only the first (left) conjunct of a conjoined sentence falls out from the linear adjacency condition on merger. Since only the left conjunct is adjacent to the verb, it is expected that only that left conjunct will merge.

While the merger process for Irish verbal inflection is identical in nature to the process for Papago inflected imperatives, the rules which cover the Irish

case are much more specific than those for Papago. The grammar of Irish must list all the pronominal subjects which are allowed to merge with each particular tense/aspect form of the verb. The merger rule itself is obligatory, and is simply the ordered pair (74):

$$(74) \quad (V, \text{pronoun})$$

but each verb merges with different pronominal subjects when it has a particular tense and aspect. For example, in the conditional paradigm of cuir 'to put', the merger rules are

$$(75) \quad \left(\begin{bmatrix} +V \\ +\text{cond} \\ \text{"put"} \end{bmatrix}, [+1] \right) \\ \left(\begin{bmatrix} +V \\ +\text{cond} \\ \text{"put"} \end{bmatrix}, [+2\text{sg}] \right)$$

In contrast, the present tense paradigm of the same verb requires only the rule

$$(76) \quad \left(\begin{bmatrix} +V \\ +\text{pres} \\ \text{"put"} \end{bmatrix}, [+1\text{sg}] \right)$$

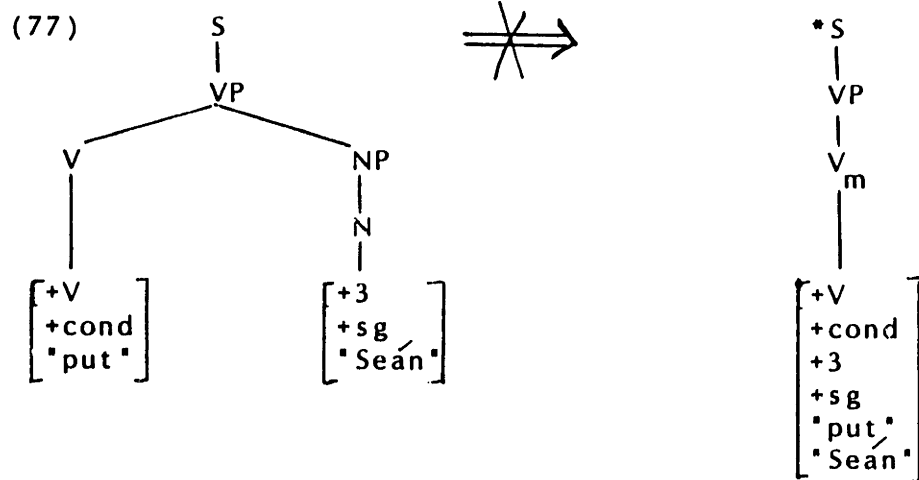
because that particular paradigm contains only one synthetic form. It is likely that for a verbal paradigm, some of the rules could be collapsed; for example, both present and conditional cuir fuses with a first person singular subject, but I will not go into such detail here.

The fact that Irish must list each occurrence of merger is not as undesirable as it may first appear. The nature of verbal inflection in Irish is every bit as idiosyncratic as such a listing implies. The merger rules conform to the intuition that synthetic verb forms in Irish are unpredictable and accidental, a fact which may be behind the observation that synthetic forms are on their way out.

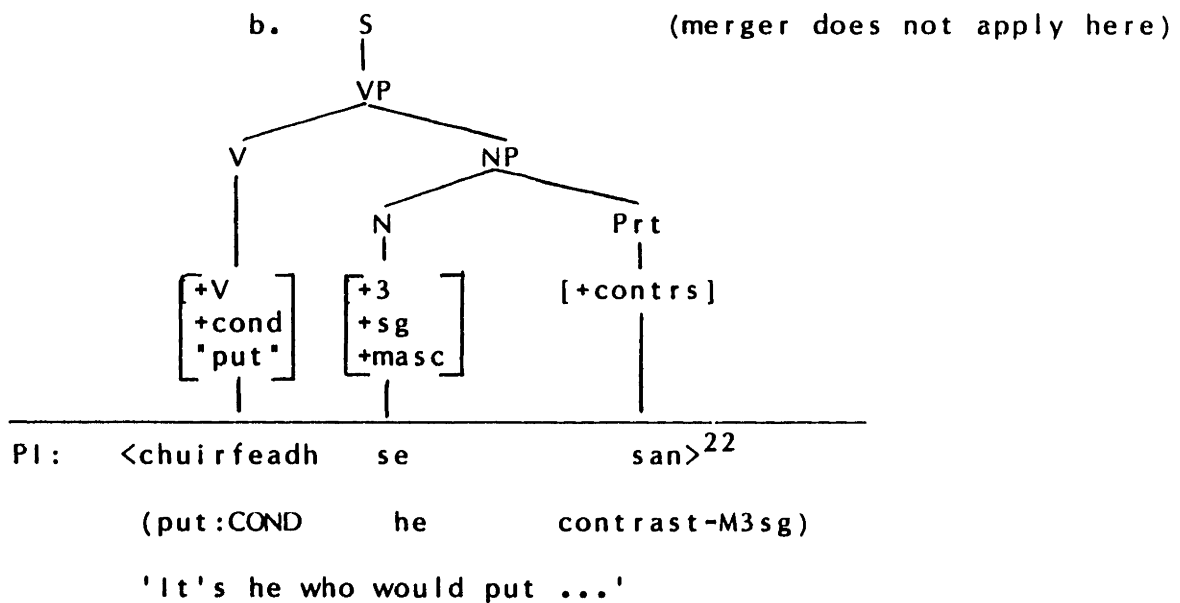
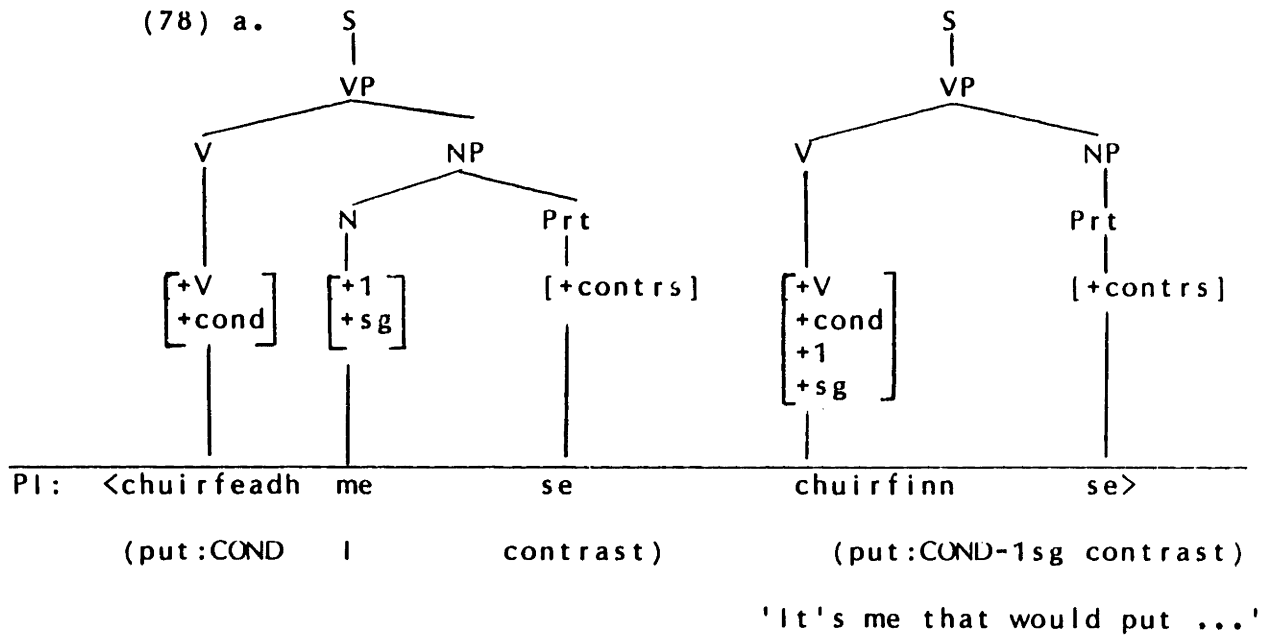
Merger explains why nonpronominal subjects in Irish cannot co-occur with synthetic verb forms: a combination like (77) does not undergo merger because the lexicon lacks an item that specifies the full lexical content of the would-be merged node. The grammar of Irish does not specify among its merger rules combinations such as

$$* \left(\begin{bmatrix} +V \\ +\text{cond} \\ \text{"put"} \end{bmatrix} , \text{"Seán"} \right)$$

The verb therefore remains independent of its lexical subject, and the result is -- must be -- an analytic verb form.



The merger analysis does not have to specify that the syntactic behavior attributed to independent pronominal subjects can also be attributed to subjects represented by synthetic verb forms, since the subject of the inflected verb is identical to the independent pronominal subject which underlies it. That both types of subjects co-occur with the contrastive particle, for example, is predicted by merger, because the gf-bundle for that particle will be available at d-structure and then not disturbed by the subsequent merging of V and the pronominal N:



In either case of (78), the emphatic particle retains its post-subject position.

The grammar specifies which constituents may merge, and whether such merging is obligatory. The existence of occasional synthetic-analytic doublets in Irish

verb paradigms suggests that merger is optional in those few cases. I do not consider this a problem; all analyses of Irish verbal inflection must confront pairs like the following.

chuirfeadh siad - chuirfidis

'they would put'

The merger rule for this kind of case is

$$\left(\begin{bmatrix} +V \\ +\text{cond} \\ \text{'put'} \end{bmatrix}, \begin{bmatrix} +3 \\ +\text{pl} \\ +\text{masc} \end{bmatrix} \right) \text{ OPTIONAL}$$

I will consider next two other sets of data from Irish. The first is the set of prepositions, most of which are inflected for the person-number features of their pronominal objects. I will show that the prepositional facts are neatly captured by the merger analysis offered above. In contrast, I will argue that the second set of data, the genitive NP construction involving pronominal possessors is not an instance of merger. I conclude instead that a simple PF movement rule will account fully for the genitive pronoun facts.

2.2.2 Prepositional inflection.²³ Pronominal objects in prepositional phrases in Irish follow the same distribution as that of pronominal subjects: most prepositions have inflected forms indicating the person-number features of their objects, and where such an inflected form does not exist, the preposition is followed by an overt pronoun that functions as its object. Unlike the case of verbal inflection, prepositional paradigms generally contain the full range of synthetic forms corresponding to each person-number combination, as shown below.

(79) a. le 'with'

	<u>singular</u>	<u>plural</u>
1	liom	linn
2	leat	libh
M3	leis	leofa
F3	léithi	

b. i 'in'

	<u>singular</u>	<u>plural</u>
1	ionnam	ionnainn
2	ionnat	ionnaibh
M3	ann	ionnta
F3	innte	

c. gan 'without'

	<u>singular</u>	<u>plural</u>
1	gan mé	gan muid
2	gan tú	gan sibh
M3	gan é	gan iad
F3	gan í	

MH point out that the synthetic form of a particular preposition-pronominal object combination cannot be predicted from the preposition-pronoun sequence; the synthetic paradigm of each preposition is distinct and 'must be learned separately

from all others" (p.10). The analytic, or citation form of the preposition is used with nonpronominal objects, parallel to the verbal inflection case: le Sean 'with John', etc.

Because the prepositional paradigms are richer in synthetic forms than verbal paradigms, there are significantly fewer analytic preposition + independent object pronoun sequences than seen in the verbal counterparts. Nevertheless, the syntactic behavior of the two kinds of prepositions prepositional phrases -- inflected and analytic -- is almost identical to that of the verbal alternates. Independent pronominal objects and inflected prepositions are mutually exclusive. Both prepositional inflection and overt pronominal objects may be augmented by the various reflexive, contrastive and demonstrative elements discussed above regarding verbal inflection:

- (80) reflexive: leis féin 'with himself'
 contrastive: leisean 'with him'
 demonstrative: leis seo 'with this'

Both inflection and overt pronouns behave as resumptives in indirect relative clauses; neither can take part in direct relativization. Both inflectional and independent pronominal objects can be the head of a relative clause. In short, once again we see that inflection and overt pronouns share identical syntactic characteristics.

The one deviance from the parallelism between verbs and prepositions concerns coordination. Cases comparable to (67) above do not exist for inflected prepositions. MH show that the conjunction of prepositional phrases is highly favored over the constructions which conjoin only the objects of a preposition rather than joining two full PPs. Perhaps this lies behind the ill-formedness of cases in which an inflectional object is conjoined with a full NP.

- (81) a. ?*Labhair sé liom-sa agus mo mháthair.
 (spoke he with:1sg-CONTRAST and my mother)
 'He spoke with me and my mother'
- b. Labhair sé liom-sa agus le mo mháthair.
 (spoke he with:me:CONTRAST and my mother)
 'He spoke with me and with my mother'

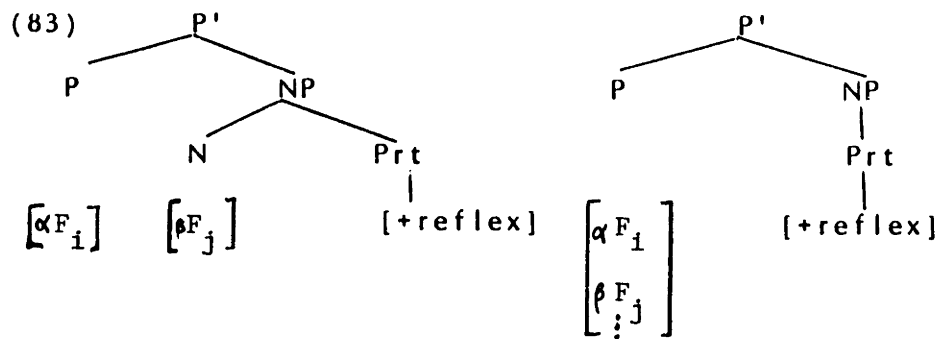
Despite this incongruity in the otherwise complete parallelism with verbal inflection, the evidence compels the analysis of prepositional inflection to be the same phenomena as verbal inflection.

The merger analysis of Irish verbal inflection and Papago imperatives discussed above accommodates the facts about Irish prepositional inflection without difficulty. On the merger model, the gf-bundle of the pronominal object of a preposition is merged with the gf-bundle of that preposition. This merger is obligatory and quite general: the lexical entries of the four prepositions which

do not merge with their pronominal objects will note their exceptionality to merger. The merger rule for Irish prepositions is (82).

(82) (Prep, obj_{pron}) OBLIGATORY

As in the case of Irish verbs, the explanation of why the various intensifiers and pronominal supporters like fein co-occur with synthetic prepositions (and verbs) is that they are not affected by merger.



During PI, the phonological matrix corresponding to the gf-bundle of the reflexive particle following the noun in (83) will be spelled out <féin> regardless of whether merger has taken place between the gf-bundle of P and the gf-bundle of N in (83). On this model, nothing special need be said for the occurrence of e.g., feín, with nonmerging prepositions like gan 'without' in gan tú féin 'without yourself'.

How does merger compare to Anderson's incorporation analysis of Breton? Recall from Chapter 1 that Breton (like Irish) exhibits complementarity between overt inflection on the verb and an overt subject NP. That is, either the verb is inflected for the person/number features of a pronominal subject, or it remains

uninflected when co-occurring with a lexical NP subject. Anderson proposes that the agreement morphemes which inflect the verb for its subject's features are actually the set of subject pronouns in Breton, obligatorily moved into the position of agreement by a local rule. Anderson suggests that inflected prepositions in Breton are formed in a similar way: a pronominal object is incorporated into the preposition, while a lexical NP object remains independent and the preposition appears in its uninflected form. Thus the same complementarity of overt NP or overt inflection obtains in the case of the preposition.

The Breton facts are quite similar to the inflection facts in Irish. In Irish, however, subject pronouns and inflected verbs (likewise, object pronouns and inflected prepositions) are also complementary. That is, the complementarity does not hold between lexical NPs and inflection, but rather, between overt subjects (pronominal or not) and inflection. I maintain that merger rules identify which verb-pronoun sequences may merge into synthetic verbs; to modify the analysis to accommodate the data from Breton, I can generalize the merger rule to apply to every sequence of verb and pronoun (or preposition and pronoun). Anderson, in turn, to account for the Irish facts with his analysis of Breton, must weaken the obligatory movement rule repositioning a pronominal subject in the agreement position to a set of individual rules naming specific verb-pronoun combinations that result in inflected verbs in Irish. In essence, the analyses are equivalent. Therefore, as I stated in Chapter 1, the real difference between the two analyses lies not in their treatment of this kind of data, but in the conceptual framework upon which they are founded.

In the next section I will review MH's evidence that proclitic pronominal possessors in genitive constructions have the same characteristics as inflection in the cases we have already seen.

2.2.3 Genitive constructions. A nonpronominal possessor follows its head in genitive NP constructions: teach Eoghain 'Owen's house', post Sheáin 'John's job', etc. In contrast, a pronominal possessor is indicated by a proclitic possessive particle.

- | | | |
|------|------------------------------|-------------------------------------|
| (84) | <u>mo teach</u> 'my house' | <u>ár dteach</u> 'our house' |
| | <u>do teach</u> 'your house' | <u>bhur dteach</u> 'your(pl) house' |
| | <u>a teach</u> 'his house' | <u>a dteach</u> 'their house' |
| | <u>a teach</u> 'her house' | |

Although written as separate words, the particles are nonetheless proclitic: nothing can intervene between the particle and its head N.

"Verbal nouns" in progressive aspect exhibit the same lexical NP/pronoun distinction in their direct objects as that cited above for the genitive construction. That is, a nonpronominal direct object follows its head, i.e., the verbal noun, while a pronominal direct object has the shape and position of the pronominal possessive particles given in (84). Compare (85.a) and (85.b) below.

- (85) a. Bhí muid ag cuartú tí.
 (were we PRT seek:PROG house:GEN)
 'We were looking for a house'
- b. Bhí siad do mo chuartú.
 (were they PRT my seek:PROG)
 'They were looking for me'

In both possessives and verbal noun progressives, then, the pronoun has a behavior different from that of the lexical NP, calling to mind the pronoun/lexical NP distinction in verbal and prepositional inflection. MH concludes that the pronominal possessor/verbal noun direct object is yet another instance of the agreement phenomenon. They posit in the regular post-head position of possessives and verbal noun progressives a pro with which the proclitic possessive particles like mo, et al. agree.

A much simpler analysis is to assume that the proclisis of genitive pronouns is determined by a movement rule in PF which fronts the pronoun: teach mo --> mo theach. No agreement between pro and a proclitic particle is needed. A general form of this movement rule is given in (86):

$$\begin{array}{ccccccc}
 (86) & [_{NP} & N & & [_{NP} & \text{pron}_{\text{poss}} & X]] \\
 & & 1 & & 2 & & 3 \longrightarrow \\
 & & 2 & 1 & & 0 & 3
 \end{array}$$

Although MH consider the genitive case as parallel to the agreement phenomena of verbal and prepositional inflection, and extend their agreement analysis to this case, I see no reason to argue that the genitive construction is the same kind of phenomenon as the inflection studied above. I therefore reject merger as the source of the unique pronominal behavior in genitive constructions. First, there is no reason to assume that the underlying pronominal possessors are any other than those which surface --albeit proclitic rather than enclitic to their head -- in all genitive constructions. By analyzing these possessive particles as generated underlyingly in the same position as nonpronominal possessors, I need postulate only one shape of genitive construction. Since the uncomplicated (86) can account for all cases of pronominal possessors, the merger analysis is unnecessarily powerful in this case. Finally, a merger analysis suggests the possibility of an "unmerged" string surfacing in some instances, as we find in both the preposition and the verbal paradigms. Merger is appealing when it must explain a syntactically odd -- and not regular -- morphological phenomenon; however, the genitive construction is fully regular, not only in semantically genitive instances, but also in the strictly formal cases of genitive-marked syntactic strings represented here by the verbal noun data. For these reasons, I choose (86) as the rule accounting for genitive constructions in Irish, and consider (86) the source of pronominal behavior in this construction. Merger is the source of verbal and prepositional inflection.

In conclusion, the merger analysis has several advantages over the agreement analysis of Irish posited by MH. First, the merger process explains the mutual exclusivity of inflected verbs or inflected prepositions and overt pronouns by

viewing the inflected form of a verb or preposition as a syntactic combination of the gf-bundles of these otherwise independent items. Next, the parallel between overt pronouns and inflected verbs or prepositions regarding their identical syntactic nature in a variety of constructions is accounted for by the assumption that they are identical, that is, that the same gf-bundles are operative in each case. However, the inflected form represents the results of a process in the syntactic derivation (i.e., merger) which the analytic form does not undergo. The pronominal behavior of inflected forms thus follows automatically from this identity. Only one set of pronouns need be postulated for the language, instead of both the overt and null sets required by the agreement analysis. Finally, on the merger analysis occasional doublets are seen to emanate from a single d-structure, rather than from two different d-structures as MH must say. The overlap in forms of these doublets is taken to be a relaxation of the obligatory nature of some instances of merger. MH are forced to the position that there are two distinct sentences, one containing pro and an inflected verb, and the other an analytic verb followed by a pronoun, which result in the existence of such doublets.

In the next section I will return to Papago to examine another instance of syntacto-morphological interaction. This case concerns the morphological process of the truncation of unsuffixed perfective surface forms, and the consequences for truncation when perfective verbs end up clause-final in surface structure in conjoined sentences. I will conclude that merger occurs to incorporate the verb and an immediately following "proximate" conjunction.

2.3 Truncation and conjunction. The interaction of clausal conjunction with the 'truncation' of perfective verb stems is yet another case in Papago where the determination of word order seems to (logically) precede certain lexical processes. I will argue that truncation is a lexical process, but that conjunction is syntactic. On this account, the fact that perfective verbs bearing conjunctive suffixes do not undergo truncation must have a lexical explanation. This is because suffixation must precede truncation in the lexicon in order to bleed it. I begin by considering perfective verb truncation.

2.3.1 Truncation of perfective verbs. The surface perfective form of most verbs is created by the deletion of the final CV of the underlying perfective stem. Sometimes other phonological processes such as diphthongization (cf. (88)) below or reduplication (as in (90)) combine with final CV deletion to render the surface perfective form. When the imperfective and perfective stems for a given verb are identical, the imperfective / perfective contrast exemplified in (87) is observed.

(87) <u>underlying</u>	<u>surface (phonetic)</u>	
	<u>imperfective</u>	<u>perfective (truncated)</u>
/maaka/ 'give'	[maak] ²⁴	[maa]
/duuka/ 'rain'	[juuk]	[juu]
/wiruuta/ 'swing'	[wiɖut]	[wiɖu]
/bidima/ 'pass'	[bijim]	[bij]
/huruni/ 'set'	[huɖuñ]	[huɖ]
/tikapana/ 'work'	[cikpan]	[cikp]
/hikuteka/ 'cut'	[hikck]	[hikc]
/oida/ 'follow'	['oid]	['oi]
/haina/ 'shatter'	[hain]	[hai]
/waaka/ 'enter (sg.)'	[waak]	[waa]

(General phonological processes like final-vowel reduction and palatalization are described in Hale (1965), Saxton and Saxton (1969), among others. I will assume the effects of these rules without discussion here.) In each case of (87), the perfective form is rather transparently derived from final-CV deletion of the underlying stem. Generally, tri-syllabic or longer verbs fall into this class.

A second class of single-stem verbs form the perfective by deleting the final-CV of the stem, and diphthongizing the final vowel of the resulting form. The verbs in this class are generally disyllabic and contain a coronal (/t,d,n,s/) in the final syllable of the stem.

(88) <u>underlying</u>	<u>surface</u>
	<u>imperf.</u> <u>perf. (trunc.)</u>
/daasa/ 'set'	[daaɕ] [dai]
/naada/ 'kindle a fire'	[naad] [nai]
/saada/ 'herd'	[ɕaad] [ɕai]
/esa/ 'plant'	['es] ['ei]
/wooda/ 'lay (sg.)'	[wood] [woi]
/koosa/ 'sleep (sg.)'	[koosɕ] [koi]
/tuusa/ 'extinguish'	[cuusɕ] [cui]
/taani/ 'ask for'	[taan̥] [tai]
/maati/ 'know, learn'	[maac] [mai]

A third class of single-stem verbs, this time of the canonical form CVCV, exhibits a lengthening of the final vowel characteristic of mono-syllabic stems derived by truncation.

(89) <u>underlying</u>	<u>surface</u>
	<u>imperf.</u> <u>perf. (trunc.)</u>
/mera/ 'run'	[med̥] [mee]
/wura/ 'rope'	[wud̥] [wuu]
/hima/ 'walk'	[him] [hii]

Many perfective stems are distinct from their imperfective counterparts. Some verbs reduplicate a portion of the imperfective stem to form the perfective stem. Once the perfective stem is formed by reduplication (or any other process

we will see below), the deletion of the final CV of that perfective stem applies as in (87), yielding for this class the surface perfectives in (90).

(90) <u>underlying</u>	<u>imperf.</u>	<u>perf.</u>	<u>perf.</u>
<u>stem</u>	<u>surface</u>	<u>stem</u>	<u>truncated</u>
/soaka/ 'cry'	[ʃoak]	/sosaaka/	[ʃoʃa]
/deeni/ 'smoke'	[jeeñ]	/deedena/	[jeej]
/hiinaka/ 'yell'	[hiink]	/hihinaka/	[hihin]
/wooni/ 'pluck'	[wooñ]	/woɕpona/	[woop]
/wiini/ 'savor, suck, as mesquite bean'	[wiiñ]	/wiipina/	[wiip̃]
/kowa/ 'dig up'	[kow]	/kookowa/	[kook]
/biita/ 'defecate'	[biit]	/hiibita/	[biib̃]
/gewa/ 'hit'	[gew]	/geegewa/	[geeg]
/dooa/ 'copulate'	[doo]	/doodoma/	[dood]

The perfective form of verbs with shape CV(L)V, L a laryngeal, depend on whether one or two stem-alternants are available for a given verb. (cf. the alternants /hima/ - /himi/ above). Several subclasses are represented in (91):

(91)	<u>stem 1</u>	<u>stem 2</u>	<u>perf.</u>
a.	/da'a/ 'fly'	/da'i/	[daa]
	/gi'a/ 'rope'	/gi'i/	[gia]
	/hi'a/ 'urinate'	----	[hia]
	/me'a/ 'kill'	----	[mea]
	/ba'a/ 'swallow'	/ba'i/	[baa]
b.	/behe/ 'get'	/be'hi/	[bei]
	/ke'e/ 'bite'	/ke'i/	[kei]
	/ne'e/ 'sing'	/ne'i/	[nei]
	/me'e/ 'burn'	/me'i/	[mei]
c.	/muu/ 'wound'	----	[muu]
	/wia/ 'ruin'	----	[wia]
	/wua/ 'put obj'	----	[wua]

The generalizations that (91) displays are that if there is an *-/a/-*final stem, it is used as the perfective stem, as in (91.a); if no *-/a/-*final stem is available, an *-/i/-*final stem (if available) is the perfective stem, see (91.b). When there is only one stem, of course, that stem must enter into all word formation processes, including that of perfective formation. Regardless of which stem is chosen, the perfective is formed for this class by the deletion of the laryngeal. Thus in (91.a), where underlying *-/a/-*stem is the perfective stem, the perfective can be construed as this stem minus the laryngeal. Also in (91.b), where an

-/i/-final stem is the perfective stem, the perfective has the shape of this stem without the laryngeal.

Group (91.c) is taken to be a "laryngeal-less" subclass of the laryngeal class, because it patterns like the laryngeals for imperative formation and other word formation processes. Since it lacks a laryngeal in its underlying form, no laryngeal can be deleted; since laryngeal deletion is the only "perfective-formation" process used for this verbal class, if laryngeal deletion cannot take place, the verbs should surface without any change for the perfective. This is the case with (91.c).

Alternatively it could be argued that (91.b) is part of class (88), where the final (underlying) CV of the stem is deleted and the final vowel is then diphthongized. I reject this hypothesis for two reasons. First, (91.b) is more nearly identical to (91.a) than to (88), since both parts of (91) have the "canonical" laryngeal shape CVLV, while the verbs in (88) have long vowels and no laryngeals. Thus (91.a) and (91.b) form a more natural class, and the same deletion process -- loss of the laryngeal -- can be attributed to both. The fact that each of these subclasses uses a different stem on which to form the perfective laryngeal deletion is not really relevant, since the -/a/-final stem is not available for (91.b). The second reason for preferring to group (91.a) and (91.b) together is that in both cases, a stem exists that could be related to the surface form by simple deletion of the laryngeal, while to group (91.b) with (88) requires deletion of the laryngeal plus the final vowel, followed by obligatory diphthongization of the resulting monosyllabic string.

Every perfective verb seen so far has involved the deletion, or truncation of some part of the underlying stem. At times this truncation has been preceded by other phonological processes such as the reduplication of the stem in (88). Still other times the truncation has been accompanied by processes like diphthongization. I will draw a distinction between processes that form the underlying stem (e.g., reduplication in (90)), from processes that are part of the truncation process itself, like obligatory diphthongization in (88) or vowel lengthening in (89). The significance of this distinction will be made clear below, when I consider how suffixes interact with perfective verb stems.

Stative verbs like s-maac 'to know', wa'awan 'to be soaked through, sweating', and mehidag, 'to be inflammable', are not used in perfective aspect, hence they have no perfective forms, truncated or otherwise. Some verbs, however, which can be used in the perfective, e.g., gikuj 'to whistle' or kuhu 'to make sounds (of certain animals, i.e., hoot like an owl, moo like a cow)' do not have truncated forms: the imperfective and perfective forms are identical:

(92)	<u>underlying</u>	<u>imperf.</u>	<u>perf.</u>
	/gikudi/ 'whistle'	[gikuj]	[gikuj]
	/kuhu/ 'animal call'	[kuhu]	[kuhu]
	/iita/ 'scoop up'	['iit]	['iit]

Suffixes which create complex derived verbs when applied to various lexical items can be divided into two classes: those that truncate and those that do not.

I am speaking here of suffixes which themselves exhibit truncation, not suffixes that cause truncation in a preceding verb. Among the suffixes which do not themselves truncate are applicative /-mada/ and factorial /-t/:

(93) <u>stem</u>	<u>suffix</u>	<u>derived verb</u> <u>(nontruncated surface form)</u>
/ona/ 'salt'	/-mada/	['onmad] 'to salt
/savoni/ 'soap'	'	[savoñmad] 'to soap'
/asugali/ 'sugar'	'	['aʃugalmad] 'to sugar'
/atoli/ 'gravy'	/-ta/	['atolt] 'make gravy'
/paana/ 'bread'	'	[paant] 'make bread'
/atosaa/ 'diaper'	'	['atoʃat] 'make a diaper'

Other suffixes do truncate (i.e., do have truncated forms). Two truncating suffixes are causative /-tuda/ and /-mera/, from the verb 'to run', meaning 'to go and X':

(94) <u>stem</u>	<u>suffix</u>	<u>derived verb</u> <u>(truncated surface form)</u>
/tikapanaa/ 'work'	/-tuda/	[cikpanac] 'to make X work'
/bisicika/ 'sneeze'	•	[bisckc] 'to make X sneeze'
/himi/ 'walk'	•	[himic̣] 'to make obj. move'
/tikapanaa/ 'work'	/-mera/	[cikpanam] 'go and work'
/e wailaa/ 'dance'	•	['e-wailam] 'go and dance'
/taani/ 'ask for'	•	[taañim] 'go and ask for'

All suffixes block truncation in a preceding verbal stem. By this I mean that any suffix added to a perfective stem will prevent the truncation processes (i.e., deletion and any processes like diphthongization that accompany deletion) associated with that stem from applying. For those verbs which "truncate" by final-CV deletion, when a suffix is added after that CV, deletion of the CV does not occur. When "truncation" involves other processes in addition to deletion, neither deletion nor those other processes takes place. In (95) I list an assortment of perfective and suffixed-perfective forms, along with both the underlying stem for the verb, and its perfective stem. Notice that formation of the perfective stem still occurs, even though truncation does not.

(95) <u>underlying</u>		<u>perf.</u>	<u>perf.</u>	<u>suffixed perf.</u>
<u>stem</u>		<u>stem</u>	(trunc.)	(not truncated)
/maaka/ 'give' =		/maaka/	[maa]	[maak-ka'i]
/wiruuta/ 'swing' =		/wiruuta/	[wiɖu]	[wiɖut-ka'i]
/daasa/ 'lay' =		/daasa/	[dai]	[daas-ka'i]
/wura/ 'tie' =		/wura/	[wud̥]	[wud̥-ka'i]
/soak/ 'cry'		/sosaaka/	[ʂoʂa]	[ʂoʂakiñ]
/deeni/ 'smoke'		/deedena/	[jee]	[jeejnañ]
/gi'a/ 'rope' =		/gi'a/	[gia]	[gi'ǎ-ka'i]
/behe/ 'get'		/behi/	[bei]	[behě-ka'i]
/wua/ 'put obj.' =		/wua/	[wua]	[wua-ka'i]

All of the derived suffixes of (93)-(94), while they themselves may or may not truncate, block truncation of the perfective stem to which they are attached.

Whether a verb (or a deverbal suffix) truncates, i.e., has a special "truncated" perfective form or not, is unpredictable, as shown above, and I take this information to be designated within the lexical entry of a particular verb. It is also difficult to predict the class membership of verbs regarding both the formation of the perfective stem and the actual truncation processes applicable to

them. Why /deeni/ of (90) reduplicates to form its perfective stem, while the superficially similar /duuku/ in (87) does not, is an idiosyncratic fact about each of those stems. That /behi/ loses its laryngeal in the perfective, and /kuhu/ retains its laryngeal, is similarly a matter of lexical unpredictability. Finally, the application of a phonological process -- deletion of final-CV -- to a strictly morphological (viz., the perfective stem) environment strongly suggests that truncation is a lexical rule. For the foregoing reasons, I conclude that truncation is indeed a lexical -- i.e., word formation -- process. I turn now to sentential conjunction to show how perfective truncation interacts with the merging of a certain class of conjunctions to a preceding verb.

2.3.2 Proximate conjunction. The conjunction of two clauses with the same subject, which Hale (1980) calls "proximate conjunction", involves the conjunction c (< /ti/), or its alternant k (< /ka/), as we will see below. C follows an imperfective clause, as in (97), which is composed of the two sentences in (96).

- (96) a. 'Ali 'o hehem.
 (child AUX:imperf-3 laugh:imperf)
 'The child is laughing.'
- b. $\tilde{\text{Neok}}$ 'o g 'ali
 (speak:imperf AUX:imperf-3 art child)
 'The child is speaking.'

- (97) 'Ali 'o hehem c 'ep ñeok
 (child AUX:imperf-? laugh:imper CONJ also speak)
 'The child is laughing and speaking.'

As in nonconjoined sentences (cf. (96)), word order within the clause is free in conjoined sentences. A subject identical to that of the first clause is not repeated in the second clause. AUX in the second clause is omitted when it carries only tense/aspect information. If AUX is semantically richer, however, it is present in both clauses:

- (98) 'Ali 'aş hehem c 'aş 'ep ñeok
 (child AUX:imperf:reportative-3 laugh:imperf CONJ also
 speak:imperf)
 'The child reportedly is speaking and also laughing.'

Here the AUX bears the reportative mood suffix [ş] (< /-sa/).

Shifting the aspect from imperfective to perfective in the first clause of (97) gives rise to two changes: the perfective-alternant proximate conjunction k replaces c, and the now-perfective verbs may truncate according as described earlier.

- (99) Hehẽ 'at g 'ali k 'ep ñeo
 (laugh:perf t-AUX-3 art child CONJ also speak:perf)
 'The child laughed and also spoke.'

- (100) a. 'Ali 'at hehě k 'ep ñeo
 (child t-AUX-3 laugh:perf CONJ also speak:perf)
 'The child laughed and also spoke.
- b. 'Ali 'at hehemk 'ep ñeo
 (child t-AUX laugh:perf-CONJ also speak:perf)

The preferred version of (100) is (b), where k is fused to hehem and truncation of hehem has not taken place. It was pointed out above that all suffixes block truncation of a perfective verb stem; I assume that k in (100.b) is suffixed to hehem and for that reason, the verb has not truncated. This is the only principled explanation that can be given for the fact that truncation has not occurred.

Independent evidence suggests that suffixation of the conjunction to a clause-final verb occurs even with imperfectives. Stative verb roots are always separated from their suffixes by the increment /-ka-/ as shown in (101).

- (101) a. 'Am 'o wo'ō-ka-him g 'ali
 (there AUX:imperf lie:imperf-ka-cont. art child)
 'The child was lying there.'

- b. 'Ali 'o 'am wo'ǒ-ka-him.
 (child AUX:imperf there lie:imperf -ka-cont.)
 'The child was lying there.'

When the stative verb is clause-final in a conjoined sentence, i.e., when it appears directly before the (here imperfective) conjunction, the /-ka-/ increment may appear between the verb and c:

- (102) a. 'Ali 'o 'am wo'ǒ.
 (child AUX:imperf there lie:imperf)
 'The child is lying there'
- b. 'Ali 'o hehem.
 (child AUX:imperf laugh:imperf)
 'The child is laughing.'
- (103) a. 'Ali 'o 'am wo'ǒ-k-c hehem.
 (child AUX:imperf there lie:imperf-k-CONJimperf
 laugh:imperf)
 'The child is lying there and laughing.'
- b. 'Ali 'o 'am wo'ǒ c hehem.
 (child AUX:imperf there lie:imperf CONJ laugh)
 'The child is lying there and laughing.'

but cf.

- c. 'Am 'o wo'oŋ g 'ali c hehem.
 (there AUX lie:imperf art child CONJ laugh)
 'The child is lying there and laughing.'

Failure of c to suffix to the verb results in (103.b). Once again, however, the preferred version is the suffixed verb in (103.a).

Med and hina are two verbs of a class in which the increment /-da-/ appears between verb and certain suffixes. This increment may appear between a clause-final imperfective verb and c:

- (104) a. Ceoj 'o meḍa-d-c hehem.
 (Man AUX:imperf run:imperf-da-CONJ laugh:imperf)
 '(The) man is running and laughing.'
- b. Ceoj 'o meḍ c hehem.
 (Man AUX:imperf run:imperf CONJ laugh:imperf)
 '(The) man is running and laughing.'
- c. Ceoj 'o hima-d-c hehem.
 (man AUX walk:imperf-da-CONJ laugh:imperf)
 '(The man is walking and laughing.'
- d. Ceoj 'o him c hehem.
 (man AUX walk:imperf CONJ laugh:imperf)
 '(The) man is walking and laughing.'

The usitative form of many CV(V)CV verbs is formed by reduplication of the initial CV combined with lengthening of the final V of the stem. Thus, for example, /mera/ --> /memeraa/ (phonetically [med̥], [mem̥da]).

- (105) Ceoj 'o mem̥da
 (man AUX:imperf run:usit)
 '(The) man runs'

In conjoined usitative mood sentences, /-da-/ appears between stem and c:

- (106) Ceoj 'o mem̥dad̥c 'ep hehhem
 (man AUX:imperf run:usit d-CONJ also laugh:usit)
 '(The) man runs and laughs'

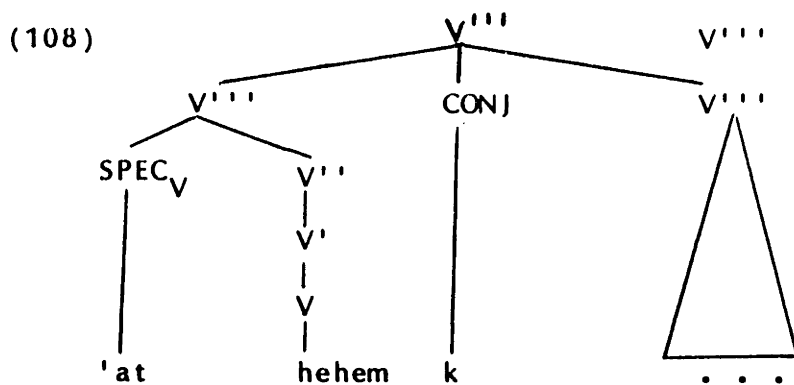
With the him/m̥ed̥ class of verbs, as with all the cases involving a clause-final verb immediately followed by a proximate conjunction, suffixation of that conjunction to the verb is optional, although as pointed out above, preferred.

I conclude, based on the above data, that the formation of the fused [verb + CONJ] form is a regular lexical process of suffixation. In order for the suffixation of perfective conjunction k to a preceding verb to block truncation of the perfective stem, it must precede truncation. Recall that several arguments were given for truncation to be considered a lexical rule. Therefore, suffixation of k must also be a lexical rule, and in fact a lexical rule applying before

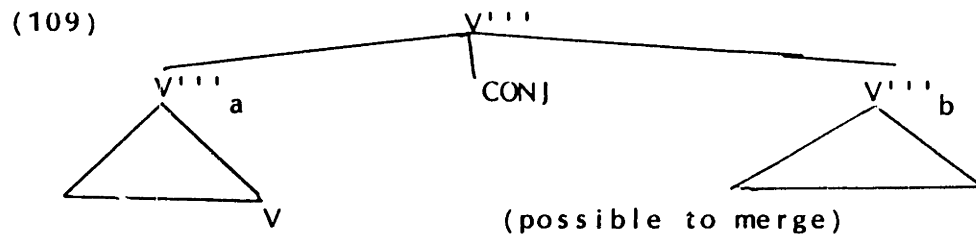
truncation. This notion is of course consistent with the intuition that the suffixation of k to a perfective verb stem forms a word and hence, should be a lexical process. It is also consistent with the notions of a multi-level word formation component of the type proposed by Lexical Phonology: on such a model, truncation can be assigned a different -- and possibly later -- level of word formation as its domain of application.

The fact that the morphophonological formation of the merged form is lexical does not mean that the source for the fusion of verb and conjunction comes exclusively from the word formation component.²⁵ I understand the incorporation of verb together with conjunction to be another case of merger, applying between two fully independent but linearly adjacent lexical items as in previous cases. Consider the base structure (108), generated by the Papago phrase structure schemata listed earlier in this chapter [section 2.1.1. (24)] plus (107), which I take to be the expansion for conjoined sentences.

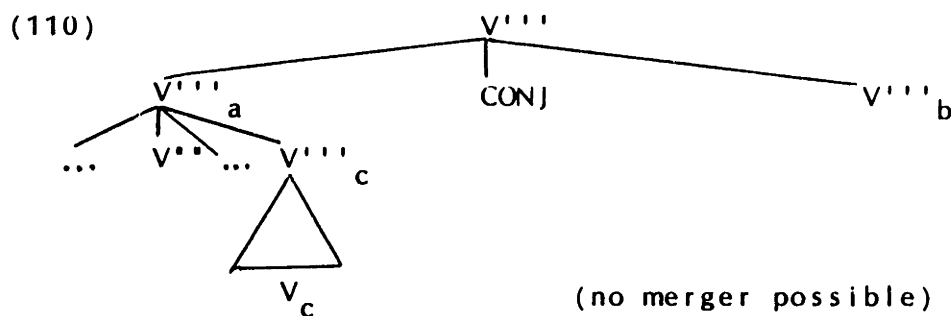
(107) $V''' \rightarrow V''' \text{ CONJ } V'''$



Merger is limited to a V CONJ sequence in which the verb is the head of a V''' conjoined by CONJ.



If the verb immediately preceding CONJ is not the head of the V''' which is the left conjunct of conjoined structure, merger cannot take place.



This latter configuration is found in a sentence such as (111)

- (111) Paɣc 'at hegai gidal (mənt tako bei) k gm-hu si 'e-mel-c
 (ruin:perf AUX that guitar (COMP-AUX yesterday get:perf) CONJ
 there-away really self-run-cause:perf)
 'He wrecked that guitar (that I got yesterday) and ran away'

Since the embedded V''' , marked V'''_c in (110), is not the left conjunct of the coordinate structure, its head (V_c) cannot merge with CONJ.

The merger rule for Papago proximate conjunctions is

(V, CONJ) OPTIONAL

Condition: V = head of left conjunct V'''

The rule is optional, and therefore merged/unmerged pairs like (100) are not surprising. The condition on the rule insures that merger cannot occur in a situation like that represented in (111).

I argued earlier in connection with the Papago imperatives that the AUX movement rule precedes merger. This has the favorable result here of preventing an ungrammatical string like *Hehemk 'at ... (where the verb is already merged with the conjunction), from arising.

A merged V-CONJ complex is taken to be a participial, due to the following observation: Unlike the Papago and Irish examples discussed earlier in this chapter, the phonological shape corresponding to the a merged V-CONJ exists independently of merger: forms like hehemk are isomorphic to one set of tenseless participial verb forms of Papago. I will show next, however, that the syntactic behavior of the participials distinguishes them from what I will now begin to call the tensed participials, i.e., the [verb + CONJ] merged forms.

2.3.3 Participials. Consider (112), a by-now familiar example of a conjoined sentence with merged V-CONJ.

- (112) 'Ali 'at hehemk 'ep 'am baa g luulsi
 (child AUX:perf laugh:perf-CONJ also there swallow:perf art candy)
 'The child laughed and swallowed the candy'

Suffixation of k to a perfective can only occur when the two are adjacent, i.e., when the perfective is clause-final, immediately preceding the conjunction. In contrast, participial forms are not final in their own clause:

- (113) Mehĩ 'at g 'e-ñeeñ 'am 'i'ik g stoñ kawhíi
 (burn:perf AUX art self-tongue there drink:part art hot coffee)
 'He burned his tongue upon drinking the hot coffee'

In (113) the object follows the participial form 'i'ik.

The conjoined sentence (114) contains a semantically complex AUX in each clause. The participial (115) does not form a separate clause and therefore does not have its own AUX:

- (114) 'Ali 'atʃ 'am 'i geeʃk atʃ s-ko'okam 'e-juu
 (child t-AUX:report-3 there prt fall:perf-CONJ AUX s-hurtfully
 self-do:perf)
 'The child fell down there and hurt himself.'
- (115) 'Ali 'atʃ s-ko'okam 'e-juu 'am 'i geeʃk
 (child t-AUX:report-3 s-hurtfully self-do:perf there particle
 falling)
 'The child hurt himself falling there.'

Only the conjoined perfective, and not the participial, co-occurs with future tense o.

- (116) a. M 'ant o him-k 'am o hema bei g gawos.
 (there AUX-1sg FUT walk:perf-CONJ there FUT one get:perf
 art gun)
 'I will go there and get a gun.'
- b. M 'ant o hema bei g gawos, 'am (*o) him-k.
 (there AUX-1sg FUT one get:perf art gun, there (*FUT)
 walk:imperf)
 'I'll get a gun there, upon going there'

Sentence (116.b) is grammatical only without the future particle o preceding him-k. Because V + CONJ participials are tensed, it is not surprising that

these -- but not the tenseless participials -- can co-occur with future particles and semantically complex AUX, as the foregoing data demonstrate.

I conclude that the tensed and tenseless participials of Papago, while homophonous, are distinct lexical items. I assume that a form like hehemk is associated with two distinct gf-bundles. Hehemk phonologically instantiates both the gf-bundle corresponding to the tenseless participial, and the gf-bundle created by the merging of the gf-bundle of a verb together with the gf-bundle of a conjunction to form the tensed participial. The syntactic differences between the participial and the V-CONJ merged form are captured by the differences in their respective gf-bundles.

Notice, however, that the same word formation process that produces the participial hehemk, namely, the suffixation of /-ka/ accompanied by the blocking of perfective stem truncation, produces the merged form. It is the reason for their production that distinguishes the participial and merged instances of hehemk. Recall that in section 2.1.2 above, where I introduced merger, I maintained that the separation of lexical entries into gf-bundles and phonological matrices suggested that more than one gf-bundle could be associated with a single phonological matrix. The participial vs. V-CONJ homonymy seen here is such an example. This case illustrates once again that PI is insensitive to the origin of a gf-bundle; gf-bundles arising in different ways may be associated with a single phonological matrix.

2.4 Conclusions. In Chapter 2 I examined the syntactic operation merger, and discussed how merger accounts for certain instances of inflection in Papago and Irish. I claimed that the grammar incorporating merger accomodates the inflection data in a more natural way than the grammar containing the traditional notion of lexical insertion into d-structure. By merger at s-structure, commposite gf-bundles are allowed to arise after move- α . PI, which applies in PF, then naturally also follows move- α .

In Chapter Three I will concentrate on supporting the proposal that there are two distinct processes CC and PI. The allomorphy phenomena to be considered do not involve merger. Although they pose a difficulty for the traditional notion of lexical insertion into d-structure, they are accounted for without difficulty by the grammar under development here.

1. The object argument can also precede the subject argument; I will not illustrate both permutations for each sentence.
2. We will see exceptions to the requirement that AUX appear in second position below.
3. In the model of grammar I adopt here, 'obligatory prefixes' like s- are treated as bound morphemes, i.e., with a diacritic in their lexical entries prohibiting them from surfacing unless they are attached to some independent morpheme. 'Optional prefixes' such as ha have two separate lexical entries, the first with the same 'bound morpheme' diacritic postulated for s-, and the second as an independent lexical item. However, the phonological matrices for both entries of ha are identical.
4. I understand prefixation to occur in the lexicon, during the word formation processes. Thus s-maac, s-hooho'id and ha-ñeid all exit the word formation component as single lexical items.
5. Here I follow Hale (1980).
6. The allomorphy of the demonstratives heg/hegai will be discussed at length in section 3.2.
7. (21) eventually becomes the sentence Cikpan 'o g Huan, after application of the AUX rule to be introduced below.
8. Here the direction of the AUX rule is rather arbitrary. Direction will be significant, however, in the discussion of the AUX rule in Chapter 3.
9. In keeping with the theory of grammar assumed here, the AUX movement rule (as well as the extraposition rule (20) above) takes place in the syntax, and therefore it actually involves only the gf-bundles (and crucially not the phonological matrices) of the lexical items composing the sentence. However, for ease of exposition, I will use orthographic representations of the gf-bundles, when specifying individual lexical items as in (A.1) below.
10. In Chapter 3 I will propose a revision of the AUX rule, which will change the directionality of movement in the case of V' daughters. The present form of the AUX rule is sufficient to account for the data in Chapter 2.
11. As I pointed out in Chapter 1, tree nodes are realized only when they contain gf-bundles, since it is the properties of these gf-bundles, as projected from the lexicon, which determine phrase structure. Therefore, nodes lacking gf-bundles, such as V" on the right side of (B.1), cease to be part of the tree. In this case, the movement of V leftward over AUX leaves V" without a gf-bundle, and consequently, V" disappears. I will continue to include the gf-bundle-less nodes in trees, to show the derivation more clearly. However, I assume that all nodes lacking gf-bundles are "pruned".
Notice that trace (t) is in some way a gf-bundle, and nodes with traces as terminal elements are not pruned. Trace is however also distinct in some way from

an ordinary gf-bundle in that the latter, but not the trace, is phonologically instantiated during Pl.

12. The plural form of the imperative construction is indicated by the presence of the particle o (isomorphic to the future particle), as in

'aapim g o cickpan!
(you:pl imp^'UX plural work:pl)
'You (pl) work!'

'am g o hihim!
(there impAUX pl walk:pl)
'You (pl) go there!'

Therefore we may assume that g bears the feature [+imp] (and possibly [+sg]). The particle o bears the feature [+pl], while the imperative V in these sentences is not marked for number.

I will simply note the plural forms here; the arguments made regarding the singular imperatives are applicable to the plurals.

13. The inflected plural forms for the sentences in note 12 are cickpano and hihimio.

14. The "inflection morpheme" that consistently appears on singular 'inflected' imperatives is n (/ni/). In the plural, it is variously -o, -io, or -wo (probably < /-woo/).

15. I will not discuss the phonological rules which yield, e.g., cikpan from /tikapana/. They are not of crucial importance to this discussion. These types of rules are discussed in Hale (1965) and Saxton and Saxton (1869), among others.

16. Cf. Marantz (1981).

17. Cf. Martin (1978) regarding the major cycles of sentence evolution. Merger could be considered a major cycle operation in the terms of that model.

18. C is either A or B, depending on the constituents involved. I will suggest below that governors dominate governed items, and heads dominate specifiers. Then if A is the head and B is a specifier, a merger between the two will produce an item of category A.

19. The merger rule for plural inflected imperative is slightly different. It must merge three elements into the inflected form: the verb, AUX and the plural morpheme o. Each element contributes a feature to the composite gf-bundle formed by merger; cf. notes 12 and 13 above.

20. Paul Kiparsky, personal communication.

21. Armstrong (1977) proposes an incorporation analysis similar to Anderson's model and also similar in spirit to the present analysis.

22. I take the incorporation of pronouns with various particles, as in se sean --> sisean to be the fusion, and not merger. I will return to this point briefly in Chapter 4.

23. The merger of a preposition with its (exhaustive) pronominal object is considered here to be a distinct process from the Irish preposition-article fusion to be discussed in Chapter 4.

24. There is a rule in Papago deleting word-final short vowels. The effects of this rule are assumed without comment here. The imperfective surface forms in these examples therefore often lack a surface final vowel; however, this rule is not to be confused with the rules that render perfectives from underlying stems.

25. That is, following Kiparsky (1982a) among others, I understand the word formation component to be located in the lexicon. This does not imply, however, that the merging together of the gf-bundles of V and CONJ occurs in the lexicon. In my understanding, the phonological matrix hehemk is associated with a gf-bundle that includes the features of V together with those of CONJ. The word formation component, independently allows the putting together of the phonological string hehem and the (suffixal) phonological string ka to form hehemk in the phonology.

CHAPTER THREE: POSITIONAL ALLOMORPHY WITHOUT MERGER

3. Positional allomorphy without merger. This chapter examines two cases of Papago allomorphy which are determined by specific syntactic configurations. Unlike the examples of inflection in the preceding chapter, however, neither the wh-question words in section 3.1, nor the demonstrative pronouns of 3.2 involve merger. Rather, these new data illustrate allomorphic variation dependent solely on particular constituent order, i.e., due to a specific syntactic position of the lexical item in question.

Here I will again make use of the processes of categorial construction ('CC') and phonological insertion ('PI') introduced in Chapter 1. While the grammatical feature ('gf')- bundle of lexical items is projected from the lexicon and is therefore present in d-structure, the phonological material is added later in the derivation, after surface syntactic positions have been established. Therefore allomorphy is treated by inserting the proper allomorph of a lexical item during PI (at PF), when the syntactic context determining the allomorphy is already available. Allomorphy as it is construed here concerns two phonological matrices which share a single gf-bundle.

3.1 Question words in Papago. I begin this section by showing that the selection of the appropriate allomorph of certain question words depends on the surface word order of the sentence. I then turn to a consideration of how this

allomorphy can be accounted for within the grammar being developed in this dissertation. I consider intonational facts of Papago sentences, and discuss how the AUX rule interacts with these facts. Elsewhere these intonational facts have been analyzed as rendering exceptional the behavior of sentence-initial question words. I will argue that a reformulation of the AUX rule incorporates the intonational facts of Papago in a natural and exceptionless system.

Wh-question words (hereafter I will designate all instances of a wh-word as 'Q') display allomorphy connected to sentential position. For example, the citation and sentence-medial form hedai 'who' surfaces as doo in sentence-initial position.

- (1) a. K hedai hehem?
 (obvAUX:imperf-3 who laugh:imperf)
 '(And) who is laughing?'
- b. Doo 'o hehem?¹
 (Who AUX:imperf-3 laugh:imperf)
 'Who is laughing?'

Certain other wh-question words also exhibit a medial-initial position alternation.

- (2) a. K hebai cikpan g Huan?
 (obvAUX where work:imperf art John)
 '(And) where did John work?'
- b. ʒaa 'o cikpan g Huan?
 (where-AUX-3 work:imperf art John)
 'Where does John work?'
- c. K has kaij g ʒuudagĩ?
 (obvAUX how make-sound:imperf art water)
 'What kind of sound does water make?'
- d. ʒaa 'o kaij g ʒuudagĩ?
 (what AUX:imperf-3 make-sound:imperf art water)
 'What kind of sound does water make?'
- e. Nap smaac map hascu taccu?
 (IntAUX:imperf-2sg s-know subAUX:imperf 2sg what
 want:imperf)
 'Do you know what you want?'
- f. ʒaacu 'ap taccu?
 (what AUX:imperf-2sg want)
 'What do you want?'

AUX generally fuses to a sentence-initial Q of the shape CVV, resulting in the deletion of the initial ['a-] segment found in most occurrences of AUX:

- (3) a. Kup heḁai cikpañid?
 (obvAUX:imperf-2sg who work-for:imperf)
 '(And) who do you work for?'
 b. Ḑoop (< ḁoo 'ap) cikpañid?
 (Who-AUX:imperf-2sg work-for:imperf)
 'Who do you work for?'
 (4) a. Kum heḁai cickpañid?
 (obvAUX:imperf-2pl who work-for:imperf-pl)
 '(And) who do you-all work for?'
 b. Ḑoom (< doo 'am) cickpañid?
 (Who-AUX:imperf-2pl work-for:imperf-pl)
 'Who do you-all work for?'

However, such vowel reduction in AUX following Q does not occur after saacu (the sentence-initial form of 'what'). Only a Q of the shape CVV causes AUX to lose its initial ['a]. The reduction rule can be stated

- (5) 'a --> ∅ / [CVV]_Q [___X]_{AUX}, X ≠ 0.

Thus (6) contains no fused Q-AUX form because the shape of Q is not the correct one for the reduction of AUX:

- (6) Ṣaacu 'up (<'ap) taccu?
 (what AUX-2sg want:imperf)
 'What do you want?'

while (7) contains no fused Q-AUX because the shape of AUX is not correct for application of the reduction rule.

- (7) Baa 'o cikpan?
 (where AUX-3 work:imperf)
 'Where does he work?'

The AUX reduction rule (5) results in such Q-AUX combinations as

ṣaa 'ap --> ṣaap 'how-AUX:imperf-2sg'
 ḍoo 'amt --> ḍoomt 'who-AUX:perf-2pl'

One way to analyze the positional allomorphy of Q is to take the "full" form, e.g. heḍai, as underlying, and assume that this form is lexically inserted at d-structure in medial position. Just in case Q ends up initial in the sentence, an allomorphy rule like (8) can replace this underlying form with its "reduced", or sentence-initial, allomorph:

- (8) $he\dot{d}ai \rightarrow \dot{d}oo / \#\# ____$,
 where ' $\#\#$ ' = sentence-boundary

Rule (8) applies after the sentential word order is established, presumably at PF.

A simpler account is achieved within the grammar here. Since CC, projecting a phrase structure from the lexicon, occurs independently of phonological insertion, the gf-bundle for a specific Q is available at d-structure, but the phonological material associated with that gf-bundle is not inserted until later in the derivation. The gf-bundle corresponding to a Q (e.g., "who") is associated with two phonological shapes (e.g., for "who", [he \dot{d} ai] and [\dot{d} oo]). However, the reduced form ([\dot{d} oo]) includes a context specification that restricts it to sentence-initial position. The Elsewhere Condition insures that [he \dot{d} ai] appears in non-initial positions and in isolation.² The appropriate allomorph of Q can be identified at the time of PI, because by that point the surface sentential position of Q is fixed.

I will assume the second of the two accounts for Q-allomorphy presented above, allowing PI to insert the appropriate phonological shape of the Q-allomorph required in a certain position in a sentence. I go on now to consider where Q is generated in the phrase structure.

Q is generated among M* of V', with a relative position following the NEG class of particles, but preceding the LOC class.

- (9) a. Pi 'añ hascu taccu.
 (NEG AUX-1sg what want:imperf)
 'I don't want anything.'
- b. Kup hedai 'am ñeid?
 (obvAUX:2sg who there see:imperf)
 '(And) who do you see there?'

Notice that when pi precedes Q, Q loses its force as a question word, and behaves like a quantifier within the scope of pi. As far as we know, the presence of pi in a clause also containing Q restricts Q to sentence-medial position, consequently prohibiting the occurrence of an initial, reduced Q in such sentences. Sentences (9) suggest a revision of the V' expansion rule (24.d) of Chapter 2 to include the Q position among M*:

- (10) V' --> (NEG) (Q) (LOC) (FUT) (CEM) (s-) (OBJ) V

According to the AUX rule postulated in Chapter 2, when Q is the first element present in V' in a sentence, the AUX rule will move it leftward over AUX into initial position, thereby deriving the Q-initial sentences seen above. However, evidence from intonational contours within the sentence suggests that the AUX rule from Chapter 2 is not the best account of the occasional sentence-initial surface position of Q.

3.1.1 Intonational contours. Hale (1975) analyzes Papago intonation in terms of the basic pitch pattern (L)HL assigned to each intonational domain, ranging in length from a single word to an entire sentence, by the association of either H or L tone with each syllabic unit. Hale's algorithm for tone mapping is reproduced below. Many details of Hale's analysis are omitted here; I refer the reader to the original paper for further information.

- (11) a. H is assigned to each stressed V, and spreads rightward between two stressed Vs;
- b. L is assigned to each unstressed V preceding the first stress and spreads leftward; if no unstressed Vs precede the first stress, L --> \emptyset ;
- c. L is assigned to each unstressed V following the last stress and spreads rightward;
- d. L is assigned to the last stressed V if it is also the last V of the domain (creating a falling tone).

This algorithm is illustrated for words in isolation and simple phrases by³

- (12) a. $\begin{array}{c} H & L \\ | & | \\ \underline{H} & \underline{i} \end{array}$ Husi 'Joe'; stressed u receives H by (11.a), and i receives L by (11.c). There is no L preceding H because nothing precedes the first stress (11.b).

- b. $\begin{array}{c} L \quad HL \\ | \quad | \\ \underline{ha-kii} \end{array}$ 'their house'; same applications as above plus
L on ha from (11.b).

- c. $\begin{array}{c} HL \\ \vee \\ \underline{med} \end{array}$ 'run:imperf'; (11.a) and (11.d) are applicable.

In more complex phrases, the same algorithm determines the intonational contours:⁴

- (13) $\begin{array}{ccccccc} L & & HH & H & L & L \\ | & & | & | & | & | \\ g[\partial] & \sim & n-'oog & go & gs[\partial] & ga \end{array}$
(art my-father dog)
'my father's dog'

Finally in sentences, the algorithm yields:

- (14) $\begin{array}{ccccccc} L & L & H & H & H & HH & HH & HL \\ | & | & | & | & | & & & \\ Nat[\partial] & g & Húsi & 'am & k'íi & w'úi & h'íi? \end{array}$
(intAUX art Joe there house to go)
'Did Joe go to the house?'

where intAUX is not stressed. Neither AUX nor the majority of M* members of V' receive stress. Two classes of exceptions to this generalization are Q and floating quantifiers, both of which will be discussed below.

Hale goes on to show that the pattern established by the foregoing types of data is not as uniform when the data base is broadened. It is true that the contour (L)HL is assigned to every intonational domain; however, this domain is not always composed of the longest inclusive string from word to phrase to sentence. Of particular interest here is the fact that when AUX occupies second position (i.e., when AUX is not prefixed), it partitions the sentence into two separate intonational domains. The first domain ends after AUX, and the second starts after AUX and continues until after the verb. For the remainder of the intonation exposition, I will indicate the boundary between domains with two vertical lines, as below.

(15) $\begin{array}{ccccc} \text{HL} & \text{L} & & \text{L} & \text{HL} \\ || & | & & | & || \\ \text{'áapi} & \text{'ap} & || & \text{ñéid.} \end{array}$

(you AUX-2sg see)

'You see (him).'

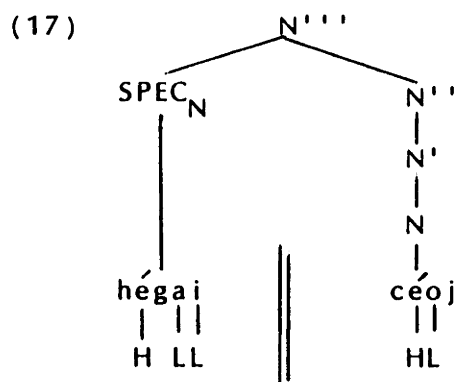
Compare the intonation contour of (15), where AUX is in second position, to that of (16), where prefixed AUX remains in initial position.

(16) $\begin{array}{ccccc} \text{L} & & \text{HH} & \text{H} & \text{HL} \\ | & & || & | & || \\ \text{Nap} & \text{'áapi} & || & \text{ñéid?} \end{array}$

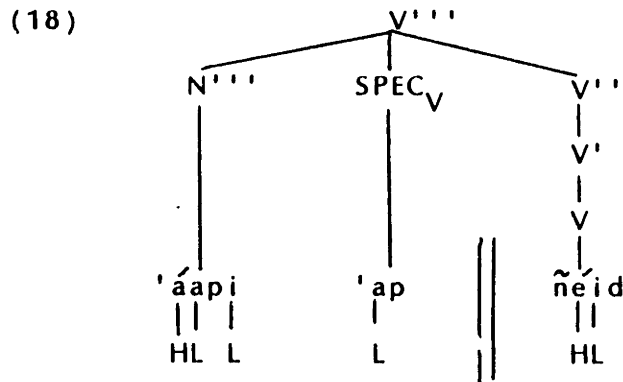
(intAUX you see)

'Do you see (him)?'

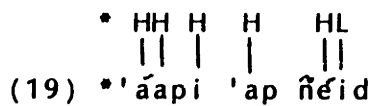
I will depart from Hale and define the maximum intonational domain as X'' , meaning that the longest string over which a single intonational contour can extend is a two-bar level phrase. This definition predicts that a three-bar level phrase will contain at least two separate intonational domains: the first covering $SPEC_X$ and the second spanning the X'' material. That is precisely what happens with N''' in (17), spoken in isolation (i.e., not contained within a larger X'' structure).



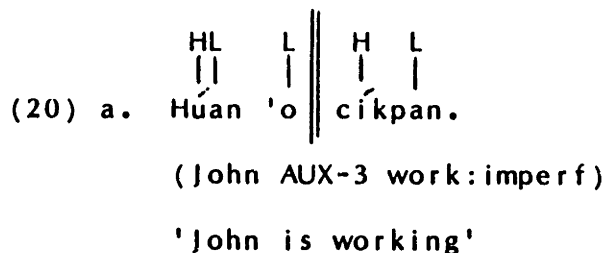
It then follows that a sentence (e.g., (15)), because it is a three-bar level projection of V , should also be divided into (at least) two domains; minimally, one for $SPEC_V$ and another for V'' . In (15), AUX is outside the intonational domain because it is $SPEC_V$, i.e., a sister to V'' and not within V'' . Notice that N''' is also outside the V'' domain, as a result of the application of the AUX rule from Chapter Two, which sister-adjoins a sentential constituent to AUX so that AUX ends up in second position.



Therefore the first intonational domains consist of N''' followed by SPEC_V, and the second domain comprises V'' i.e., in (18), all the rest of the sentence. If there were no domain boundary in (15), Hale's algorithm would yield the incorrect contour below.



Limiting the intonational domain to X'', on the other hand, gives precisely the right results using Hale's algorithm, as (18) shows. Other examples of two-domain contours include:



- b. $\begin{array}{ccccc} \text{HH} & \text{HL} & \text{L} & \text{L} & \text{HL} \\ | & | & | & | & | \\ \text{Kíi} & \text{wúí} & \text{'at} & \text{o} & \text{híi.} \end{array}$
 (house to AUX-3 FUT go:perf)
 'He will go to the house'

In contrast to the foregoing two-domain sentences like (15) and (20), some sentences do not exhibit the domain boundary predicted by the definition of the X" intonational domain. For example:

- (21) $\begin{array}{cccc} \text{L} & \text{L} & \text{H} & \text{L} \\ | & | & | & | \\ \text{Pi} & \text{'ap} & \text{cíkpan.} \end{array}$
 (NEG AUX-2sg work:imperf)
 'You are not working'

- (22) a. $\begin{array}{cccc} \text{L} & \text{L} & \text{H} & \text{L} \\ | & | & | & | \\ \text{'am} & \text{'añ} & \text{cíkpan.} \end{array}$
 (there AUX-1sg work:imperf)
 'I am working there'

- b. $\begin{array}{cccccc} \text{L} & \text{L} & \text{L} & \text{H} & \text{H} & \text{L} \\ | & | & | & | & | & | \\ \text{Pi} & \text{añ} & \text{'am-hu} & \text{cíkpan.} \end{array}$
 (NEG AUX-1sg there work:imperf)
 'I am not working there'

c. $\begin{array}{ccc} \text{L} & \text{L} & \text{HL} \\ | & | & || \\ \text{Pi} & \text{a\~n} & \text{\~n\acute{e}id} \end{array}$
(NEG AUX-1sg see.imperf)
'I don't see anybody'

Hale accounts for the distinction between the single intonational contour of sentences like (22)-(23) and those like (15), where there are two domains, by assuming that when AUX is preceded by stressless material, it does not separate the sentence into two intonational domains. To put this more clearly, second-position AUX divides the sentence into two domains only when it is preceded by (at least) one stress, according to Hale.

However, that analysis makes the sentences in (23) exceptions to the generalization that only sentences with stressless material preceding AUX are mono-domainal.

(23) a. $\begin{array}{ccccccc} & & \text{HH} & \text{H} & & \text{H} & & & & \text{HL} \\ & & || & | & & | & & & & || \\ \text{(23) a.} & \text{\textcircled{S}}\text{aacu} & \text{'up} & (\text{'ap}) & \text{\textcircled{N}}\text{éid?} \\ & (\text{what AUX-2sg see:imperf}) \\ & \text{'What do you see?'} \end{array}$

b. $\begin{array}{cc} \text{HH} & \text{HL} \\ || & || \\ \text{Doo} & \text{néid?} \end{array}$
(who-AUX:2sg see:imperf)
'Who do you see?'

Notice, further that a single intonational contour also spans (24), where AUX is preceded by the stressed verb.

- (24) $\begin{array}{ccc} H & L & L \\ | & | & | \\ C\acute{i}kpan & 'o \end{array}$
 (work:imperf AUX)
 'He is working'

When an overt subject is expressed, changing (24) to (25), a second intonational domain extending over the extraposed N''' appears:

- (25) $\begin{array}{ccccc} H & L & L & & HL \\ | & | & | & || & | \\ C\acute{i}kpan & 'o & g & H\acute{u}an \end{array}$
 (work:imperf AUX art John)
 'John is working'

A major difference between the two-domain sentences and those with a single domain is that the former contain a maximal projection of a category as the element preceding AUX, while the latter contain a daughter of V' (e.g., pi in (21), Q in (23), V in (24)). I propose that this distinction in the categorial identity of sentence-initial items, and not their stress, underlies the observed intonational differences. I will correlate particular sentence-initial items with specific intonational contours, by reformulating the 'AUX rule' from Chapter 2 to

reflect the role X''' and daughters of V' play in determining intonational contours.

I suggest that daughters of V' "attract" AUX to their right, in a sense, while major phrase projections move leftward over AUX, in order to meet the requirement that a prefix-less AUX is obligatorily second in the surface word order of the sentence. That is, I assume that AUX moves to the right of the first element of V' , whenever AUX is immediately preceded by a sentence boundary and immediately followed by a daughter of V' :

$$(26) \quad [_{V'''} (\text{AUX}) [_{V''} [_{V'} Q \text{ } \underline{\quad} V]]]$$

This means that AUX moves into the intonational domain defined over V'' . Then the string Q AUX V formed as above should have a single intonational contour. This is precisely the case for (23), as well as (4.b) repeated below.

- (4) b. $\begin{array}{ccccc} & HH & & H & & H & L \\ & | | & & | & & | & | \\ \text{Doom} & \text{cickpañid?} & & & & & \end{array}$
- (who-AUX: imperf-2pl work-for: imperf-pl)
- 'Who do you-all work for?'

The same movement into V'' (by moving to the right of the first daughter of an immediately following V') accounts for the intonational contours of (21) and (24), respectively:

- (27) a. $[_{V'''} ('ap) [_{V''} [_{V'} pi \text{ } \underline{\quad} V]]]$
- b. $[_{V'''} ('o) [_{V''} [_{V'} V \text{ } \underline{\quad}]]]$

On this analysis, the dual-domain contour of (25) is the result of the extraposing of N''' outside (i.e., to the right of) the V'' intonational boundary, while AUX moves rightward into V'' as expected. The string V AUX then comprises the first intonational domain, and the extraposed N''' the second domain.

- (28) $[_{V'''} ('o) [_{V''} [_{V'} V \text{ } \underline{\quad}]] N''']$

The rightward movement accomplishes the same goal as that of the AUX rule of Chapter 2: it results in AUX occupying sentential second position. At the same time, it offers a principled explanation of the intonational contours of monodomain sentences.

Maximal projections (N''' , P''' here), on the other hand, move leftward over AUX into sentence-initial position. A sentence like (15) is then derived as shown below.

- (29) $[_{V'''} AUX [_{V''} (N''') V]]$

This movement takes N''' out of the intonational domain defined by V'' , and consequently, there are two intonational domains in (15), as (18) above

illustrated. Notice that the movement described in (29) is precisely the movement ascribed to all sentential constituents by the AUX rule of Chapter 2, repeated below.

$$(30) \quad \text{AUX rule:} \quad \begin{array}{c|c|c|c} \# & \text{AUX} & X & Y \\ \hline & 1 & 2 & 3 \\ 2 & 1 & 0 & 3 \end{array} \longrightarrow$$

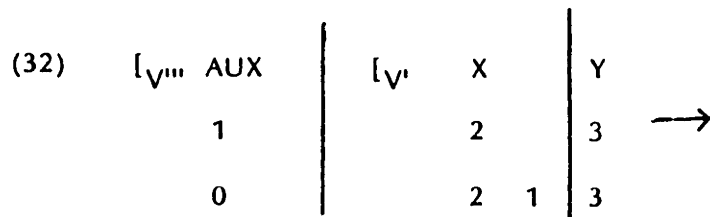
Conditions:

- a. $X = [-V''']$ or leftmost daughter of V'
- b. $X \neq \underline{o}$ (future)

3.1.2 Reformulation of the AUX rule. In view of the foregoing distinction between leftward and rightward movement of AUX into V' , (30) is inaccurate. I replace it with (31) and (32). Rule (31) is a restricted version of (30), limited now to only X''' .

$$(31) \quad \begin{array}{c|c|c} [_{V'''} \text{ AUX} & [_{V''} X''' & Y \\ \hline 1 & 2 & 3 \\ 2 \quad 1 & 0 & 3 \end{array} \longrightarrow$$

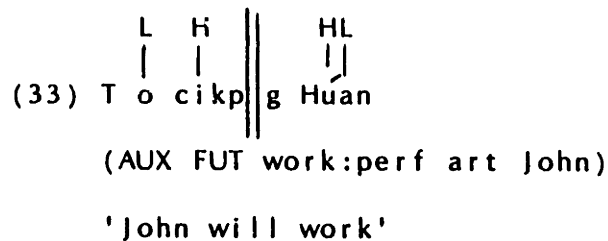
Rule (31) is a move- α process that takes place in the syntax, and it sister-adjoints X''' to AUX. The effect of (31) is to move a maximally projected category out of V' into sentence-initial position, and in doing so, remove that maximal projection from the intonational domain bounded by V'' .



Condition: 2 ≠ future o

The movement of AUX rightward in (32) is taken to be another syntactic move- α process.⁵ By (32) AUX moves to the right of the first daughter of V' , thereby moving into the intonational domain bounded by V'' , and the sentence exhibits a single domain contour through V'' , although any extraposed material following the V'' boundary will have distinct domains.

As stated in Chapter 2, the future particle o does not allow movement of AUX past it to the right. In the case of a sentence containing the string AUX-o--X, then, no movement occurs, since (32) is blocked by the stipulation that o does not meet the structural description of the rule. If no movement of AUX occurs, two intonational domains should be present, as in (33)



However, this question cannot be answered, since the domain outside of V'' in this case lacks stressed vowels, and thus intonation cannot be identified. Notice that

there is by our rules a second intonational domain boundary for the extraposed N''' in (33).

Evidence that (32) is a syntactic move-~~Q~~ process is available from the merging at s-structure of Papago verbs with proximate conjunctions, as discussed in section 2.3.2 above. Recall that only clause-final verbs merge with a following conjunction, as in example (100.b) of Chapter 2, repeated below.

- (11.100) b. 'ali 'at hehemk 'ep $\tilde{ne}o$
 (child AUX laugh:perf-CONJ also speak)
 'The child laughed and also spoke'

As I pointed out in that section, the fact that the AUX rule (revised here as (32)) applies in the syntax before merger occurs means that the ungrammatical string *Hehemk 'at . . . putatively arising by the rightward movement of AUX over a (merged) V-CONJ in fact cannot be generated. If (32) were not a syntactic move- rule, but were instead a rule at e.g., PF, there would be no way in the present analysis to prevent the ill-formed string from surfacing.

Support for the model I have proposed comes from the contours of sentences containing stressed preverbal quantifiers like héma 'one'. These sentence exhibit the same single intonational domain as initial Q when the quantifier is initial.

- (34) a. $\begin{array}{ccccc} \text{HL} & \text{L} & & \text{L} & \\ | & | & & | & \\ \text{S} & \text{i} & \text{i} & \text{'a}\tilde{\text{n}} & \text{g} \\ \text{i} & & & & \text{á} & \text{t} & \text{w} & \text{i} \end{array}$
 (deer AUX-1sg shoot:perf)
 'I shot (a) deer'

- b. $\begin{array}{ccccccc} \text{HL} & \text{L} & & \text{L} & & \text{H} & \text{H} & \text{H} & \text{L} \\ | & | & & | & & | & | & | & | \\ \text{S} & \text{i} & \text{i} & \text{'a}\tilde{\text{n}} & & \text{h} & \text{é} & \text{m} & \text{á} \\ \text{i} & & & & & \text{m} & & & \text{t} & \text{w} & \text{i} \end{array}$
 (deer AUX-1sg one shoot:perf)
 'I shot one deer'

- c. $\begin{array}{ccccccc} \text{H} & \text{H} & \text{H} & & \text{H} & \text{L} & \left(\begin{array}{cc} \text{HL} & \text{L} \\ | & | \\ \text{g} & \text{s} \\ \text{i} & \text{i} \\ \text{k} & \text{i} \end{array} \right) \\ | & | & | & & | & | & \\ \text{H} & \text{é} & \text{m} & \text{'a}\tilde{\text{n}} & \text{g} & \text{á} & \text{t} & \text{w} & \text{i} \end{array}$
 (one AUX-1sg shoot:perf (art deer))
 'I shot one (deer)'

Notice that (34.a), without a quantifier, is divided into two intonational domains. This division is predicted by (31), which moves the N''' (here (g) síiki) left of and external to the intonational domain V''. The same rule applies in (34.b), héma remains in medial position, and again there are two intonational domains. However in (34.c), where N''' is extraposed to the right of the verb, héma is left next to AUX and eventually by (32) ends up in sentence-initial position with AUX to its right. In this case, as expected, the intonational domain is undivided from héma through the verb. The fact that a second intonational domain is apparent in the N''' following V is taken to be further confirmation of this hypothesis: since NP is removed from the V''

intonational domain by extraposition, its separate intonational domain contour is also expected.

Of course, when the sentence-initial item is an unstressed preverbal particle, (cf. (21) and (22)), the intonational contour assigned the particle followed by AUX can be ambiguously understood as a single domain (described below for (22.a))

(35) $\begin{array}{cccc} L & L & H & L \\ | & | & | & | \\ 'am & 'a\tilde{n} & c\acute{i}kpan \end{array}$

or as two separate domains, the first of which lacks any stressed vowel:

(36) $\begin{array}{cccc} L & L & H & L \\ | & | & | & | \\ 'am & 'a\tilde{n} & c\acute{i}kpan \end{array}$

There is no way to test which is correct, because they give the same result. However, when the initial verbal particle is stressed, the two hypotheses (single versus dual domains) make different predictions. Taking (23.a), with stressed Q saacu, as the example, a single domain yields the contour

(37) $\begin{array}{cccc} HH & H & H & HL \\ | & | & | & | \\ S\acute{a}acu & 'up & \tilde{n}\acute{e}id \end{array}$

while if two domains are present, the predicted contour is

(38) * $\begin{array}{ccccccc} & & \text{HL} & & \text{L} & & \text{L} & & \text{HL} \\ & & ||| & & | & & | & & ||| \\ * & \text{Ṣ} & \acute{a} & a & c & u & ' & u & p & \tilde{n} & \acute{e} & i & d \end{array}$

which is incorrect. Lacking evidence to the contrary, I assume that there is only a single domain in sentences such as (38) and conclude that there is only a single intonational domain in sentence with initial stressed verbal particles, and by extension, in all sentences with initial verbal particles. Therefore I adopt the proposal that in the case of these particles, and in fact, for all daughters of V' immediately following AUX, AUX moves rightward into the intonational domain of V'' by moving to the right of the leftmost daughter of V' .

What about the intonational contours of sentences containing prefixed AUX? Neither (31) nor (32) is applicable to such sentences as (14) or (16), because the prefix attached to AUX obviates the need for a movement rule designed to shift AUX into second position. AUX is in second position, in a sense, behind the prefix. Since prefixed AUX does not move, and is not moved over by some other constituent, it remains outside the V'' intonational domain. In that case, according to my hypothesis, there should be two domains in such sentences of the form (39) as in (16) repeated below.

(39) $\left[\begin{array}{c} V'' \\ \text{prefix-AUX} \end{array} \right] \left\| \left[\begin{array}{c} V'' \\ \dots \end{array} \right] \right\|$

- (16) $\begin{array}{c} \text{L} \quad \quad \text{HL} \\ | \quad \quad || \\ \text{Nap} \quad || \quad \tilde{\text{n}}\acute{\text{e}}\text{id?} \end{array}$
- (intAUX-2sg see)
- 'Do you see (him)?'

In fact, for the three prefixes mentioned so far, all of them stressless, the intonational contour of the sentence may be taken to consist of a one intonational domain containing only low tones, and a second intonational domain with the familiar (L)HL contour.⁶

On the analysis offered here, all the intonational facts of Papago follow immediately from the definition of the intonational domain, taken together with the AUX movement rules (31) and (32). The single intonational domain in sentences containing Q and quantifiers such as héma need not be considered exceptional, and there is no need to distinguish stressed from unstressed items among the constituents which may precede AUX in surface structure. Therefore I assume this analysis and the AUX rule (31) and (32). I now return to the original concern of this section, question-word allomorphy.

The gf-bundle for Q begins in medial position in the sentence, in accordance with the phrase structure rules discussed in Chapter 2. A consequence of (32) is that Q's gf-bundle ends up initial in the sentence. When (32) does not apply, this gf-bundle remains sentence-medial. As I remarked earlier, I assume that the lexical entry for a Q, e.g., hedai/doo, lists both phonological matrices

(40) $\begin{bmatrix} +Q \\ \text{'who'} \end{bmatrix} \begin{matrix} = <\text{doo}> / \text{--- AUX} \\ = <\text{hedai}> \end{matrix}$

In the next section I examine a second case of Papago positional allomorphy, this time concerning demonstrative pronouns. Again I will make use of the notion that PI is independent of CC to account for this allomorphy.

3.3 Demonstrative pronouns in Papago. In this section I show that the distribution of the demonstrative allomorph pairs 'id/iida 'this' and heg/hegai 'that' is, like that of question word allomorphs, linked to syntactic position. However, unlike the absolute sentential position which determines question word allomorphy, the demonstrative pronoun allomorphy depends on position relative to the head of the matrix phrase containing this pronoun. I propose a "governed - ungoverned" alternation between the allomorphs as a way of describing their occurrence in the sentence.

The phrase structure schemata of Papago formulated in Chapter 2 include (11.24.a), repeated below, which allows $SPEC_X$ to fully constitute X''' .

(11.24) a. $X''' \rightarrow SPEC_X (X'') (V''')$

In the case of N''' , $SPEC_N$ (i.e., the determiner) can either appear alone as the demonstrative pronoun heg in (40)

- (40) a. Heg 'o cikpan.
 (that AUX work:imperf)
 'That (one) is working'
- b. Heg 'at cikp.
 (that AUX work:perf)
 'That (one) worked'

or as the demonstrative adjective hegai preceding ceoj 'man' in (41).

- (41) a. Hegai ceoj 'o cikpan.
 (that man AUX work:imperf)
 'That man is working'
- b. Cikpan 'o hegai ceoj.
 (work:imperf AUX that man)
 'That man is working'

- c. Hegai ceoj 'at cikp.
(that man AUX work:perf)
'That man worked'
- d. No cikpan hegai ceoj?
(intAUX work:imperf that man)
'Is that man working?'

The pair 'id/iida are similar to allomorphs heg/hegai, although the reduced form 'id not only loses its final syllable, parallel to heg, but also has a shortened vowel:

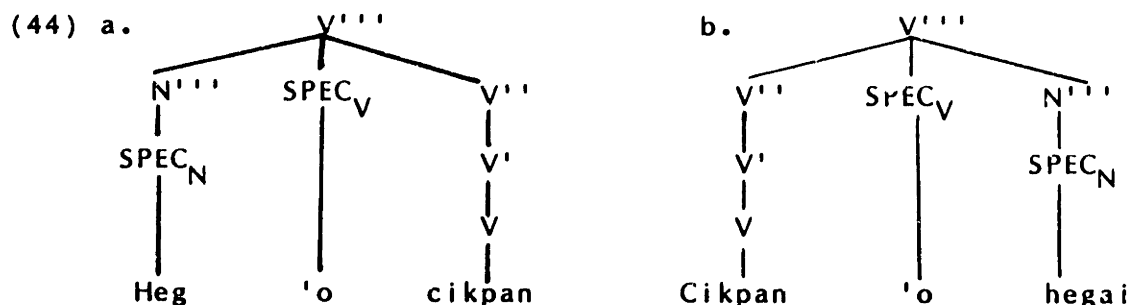
- (42) a. 'id 'o cikpan.
(this AUX work:imperf)
'This (one) is working'
- b. 'iida ceoj 'o cikpan.
(this man AUX work:imperf)
'This man is working'

The semantically-contentless g, which generally accompanies otherwise undetermined nouns and is glossed as an article, does not have a pronominal counterpart. G does not occur in sentence initial position in Papago, although in a related language, Pima, g can appear sentence-initially, in which case it appears as heg, but without stress.

The reduced/full alternation exemplified by heg/hegai (and similarly 'id/iida') is more complicated than the contrasts in (40) – (41) imply. While it is true that reduced heg appears alone in the sentence as a demonstrative pronoun, as shown in (40), hegai (as well as 'iida') also can have a pronominal status, where by 'pronominal' I mean 'able to exhaustively instantiate N''':

- (43) a. Cikpan 'o hegai.
(work:imperf AUX that)
'That (one) is working' = (40.a)
- b. Pi 'at cikp hegai.
(NEG AUX work:perf that)
'That (one) didn't work'

Heg appears to the left of the head of the matrix phrase dominating the demonstrative, and hegai appears in post-head position, i.e., to the right of that head. The contrast between (40.a) and (43.a) respectively is represented by the trees in (44), which depict PF after PI.



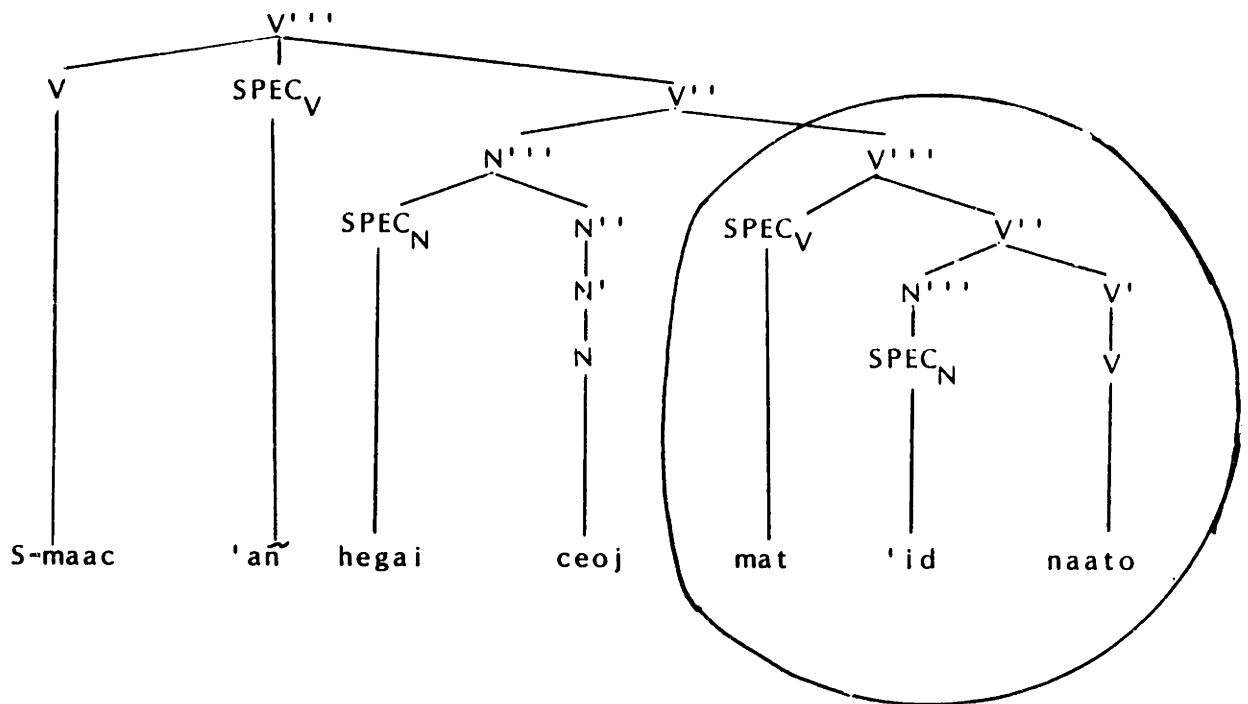
However, only hegai, and not heg, appears in an N''' as a demonstrative adjective modifying the head N .

In like fashion 'id is the pre-nuclear, and 'iida the post-nuclear demonstrative pronoun, as shown in (45) with trees (46), where (46.a) and (46.b) are identical except for the circled V''' .

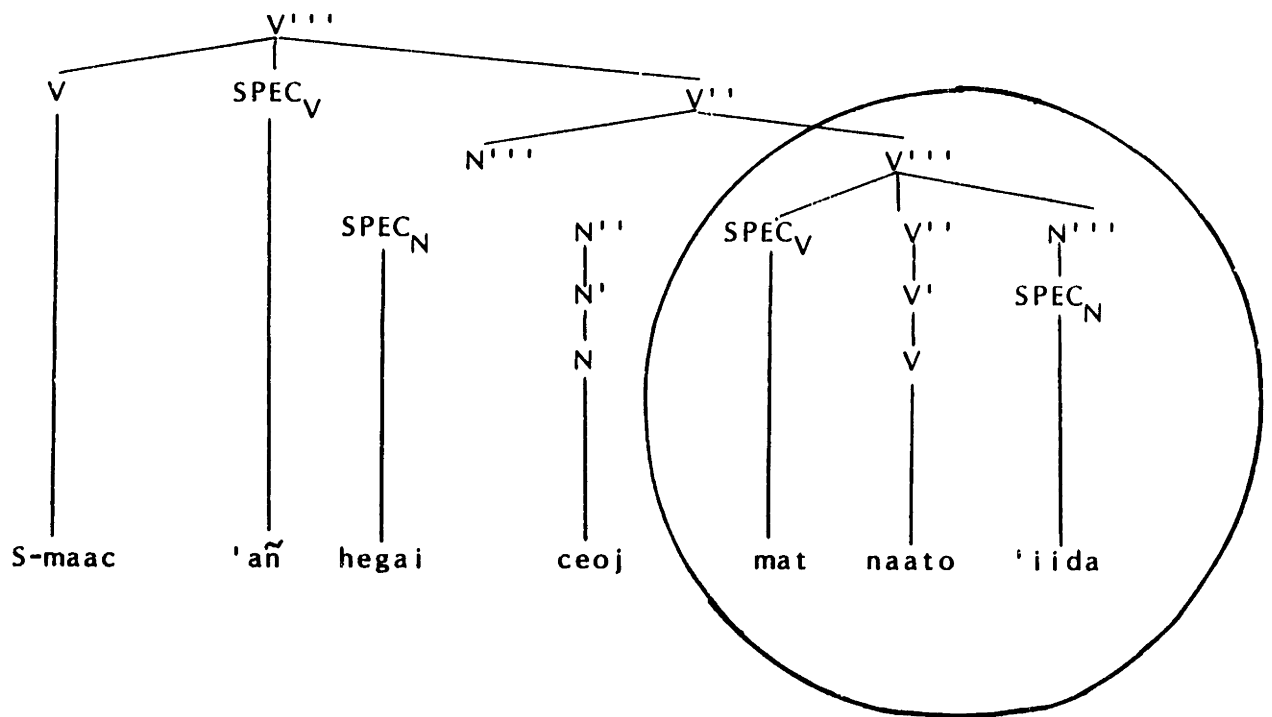
- (45) a. S-maac 'a^ñ hegai ceoj mat 'id naato
 (s-know AUX-1sg that man subAUX-3sg this make:perf)
 'I know the man that made this'
- b. S-maac 'a^ñ hegai ceoj mat naato 'iida
 (s-know AUX-1sg that man subAUX make:perf this)
 = (45.a)

(Recall that scrambling occurs in all X'' phrases by allowing the extraposing of X''' out of X'' .)

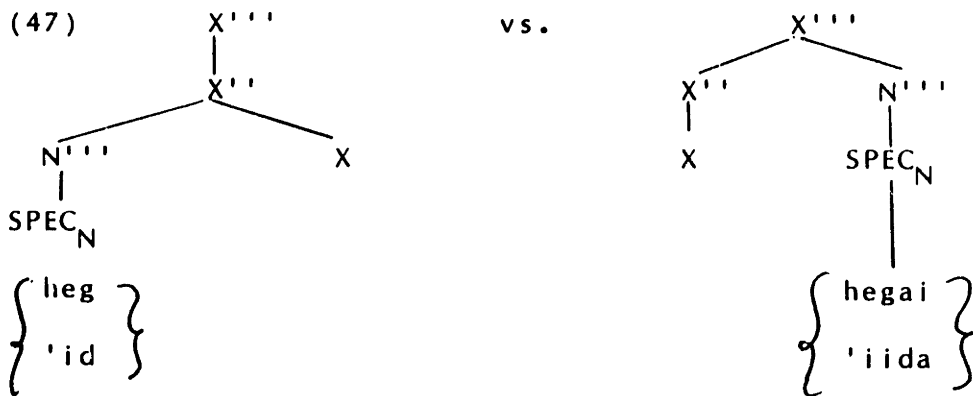
(46) a.



b.



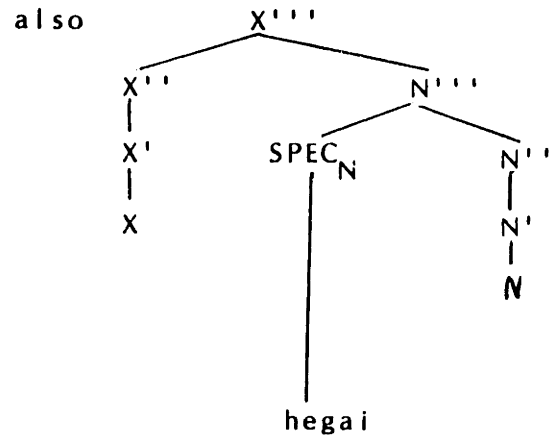
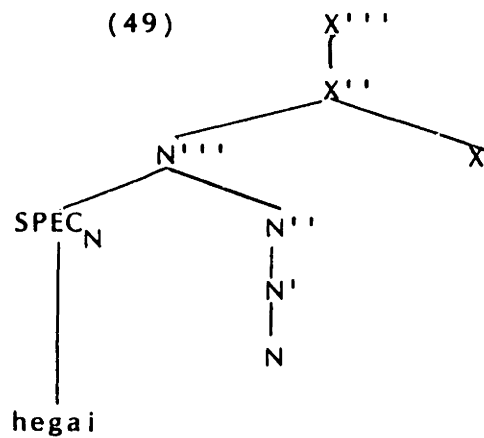
The allomorphy exhibited by heg/hegai and 'id/iida' in the above sentences is general for any headed structure containing these demonstratives. In X-bar notation the allomorphy can be schematically described as shown in (47).



X' in (47) can be any major category, as exemplified in the phrases of (48).

- (48)
- | | | |
|-------------------------------------|---|---|
| Heg $\tilde{n}eid$] _{V''} | = | [_{V''} $\tilde{N}eid$ hegai 'that (one) sees' |
| | | or '... sees that (one)' |
| heg wui] _{P''} | = | [_{P''} wui hegai 'to that (one)' |
| heg 'oog] _{N''} | = | [_{N''} 'oogaj hegai 'his father' |

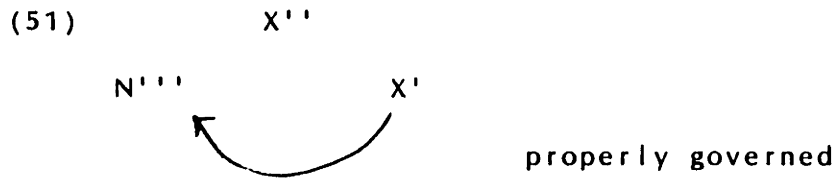
In contrast, whenever N''' contains more than SPEC_N (i.e., anytime there is an N present), SPEC_N must be spelled out as hegai, no matter which side of the phrasal head N''' appears on:



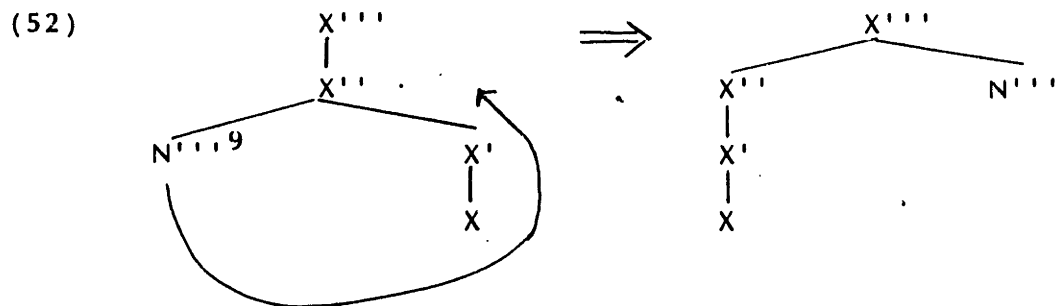
Once again, X' represents all major categories.

- (50) ... hegai ceoj ñeid = ... ñeid hegai ceoj
 'that man sees ...' or '... sees that man'
 ... hegai ceoj wui = ... wui hegai ceoj
 'to that man'
 ... hegai ceoj 'oog = ... 'oogaj⁷ hegai ceoj
 'that man's father'

I propose to account for heg/hegai allomorphy (and 'id/iida' as well) by invoking a particular definition of proper government. I designate heg ('id') as the governed allomorph, and hegai ('iida') as the ungoverned counterpart, intending the governed allomorphs to appear in governed positions, and the ungoverned allomorphs to be reserved for ungoverned positions. I assume that for an N''' to be properly governed, it must be a left sister of its governor, X' in the configuration below.

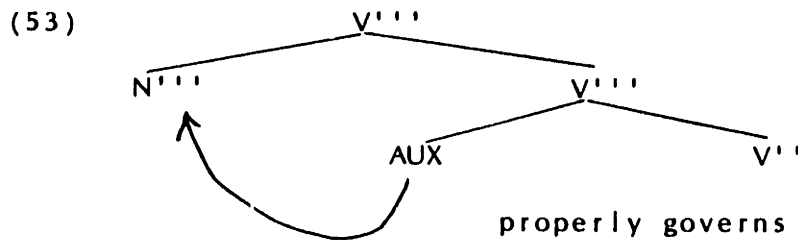


That is, I am assuming, following Koopman (to appear) and also Sproat (1983) that government is directional, and only operates leftward in Papago.⁸ Recall from the discussion of Papago phrase structure in section 2.1.1., that a rule of extraposition allows arguments of a phrasal head to move from pre-nuclear to postnuclear position, extraposing and reattaching as a sister to the X'' node dominating the head:



When extraposition occurs, as in (52), according to the definition given above, N''' is no longer (properly) governed. When no extraposition takes place, structure (51) remains intact. Notice that (51) and (52) describe precisely the environments of heg and hegai, respectively. I will adopt the notion that heg appears in a governed position, while hegai is ungoverned.

Recall also that the AUX rule (31) in section 3.1.2 above applies to sister-adjoin X''' to AUX at the left sentence-boundary. If N''' moves by (31), then, it ends up in the configuration

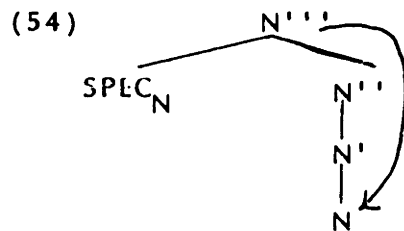


If the layer of structure added by the Chomsky-adjunction in a case like (53) is understood to be irrelevant for purposes of government, then AUX can be taken to govern N''' in (53). Then the correct form of the demonstrative pronoun in such a configuration should be heg, the governed alternate. This is the right result, as seen in (40.a) and (42.a) repeated below.

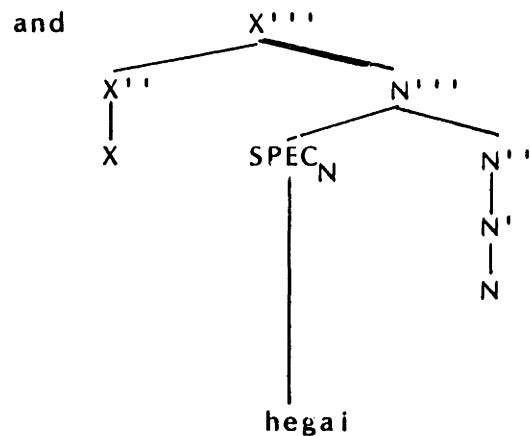
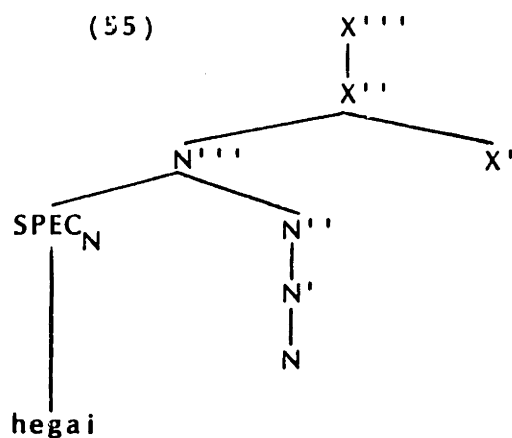
- (40) a. Heg 'o cikpan.
 (that AUX work:imperf)
 'That (one) is working'

- (42) a. 'id 'o cikpan.
 (this AUX work:imperf)
 'This (one) is working'

Why, then, does hegai and not heg appear when its N''' contains a lexical N, regardless of whether N''' is extraposed? I assume that government within a phrase is absorbed by the major category head of that phrase, as indicated by the arrow below.



This government absorption leaves $SPEC_N$ once more ungoverned, and therefore the ungoverned allomorph hegai appears in any N''' containing an N , regardless of the position of N''' within a matrix phrase.



Now that the syntactic configurations underlying demonstrative allomorphy can be accurately described in terms of governed and ungoverned positions, the phonological shapes of the allomorphs can be easily distinguished. The gf-bundle corresponding to both heg and hegai becomes part of d-structure during CC, and it is generated under $SPEC_N$, whether N''' is to be further expanded into N'' or not. In that position, N''' is governed. If N''' is extraposed, or when government of N''' trickles down to N , $SPEC_N$ is no longer governed. Since the movements (including extraposition) take place before PI, and since if there is an

N in the N^{III} its gf-bundle is available from d-structure on, at the point of PI it is clear which allomorph of the demonstrative can be inserted. Heg associates only with a governed gf-bundle; hegai appears elsewhere. I presume that a context specification [\pm governed] will distinguish the phonological matrices in the lexical entry for the demonstrative.

3.3 Concluding remarks. In Chapter 3 I considered two cases of positional allomorphy in Papago, showing that the grammar incorporating CC and PI accomodates the morphophonological variation of question words and demonstratives quite naturally. In the next section I will examine a number of examples of preposition-article "contraction" in the Romance languages and Irish. My intention will be to contrast the contraction phenomena with the cases of merger of Chapter 2. I will argue that the merger model of grammar provides a principled explanation of the differences observed between merger and what I will call the "fusion" of prepositions and articles.

1. Some speakers pronounce the reduced form [doo], i.e., with the lamino-dental [d], rather than apico-alveolar, slightly retroflex [ɖ].
2. In a sense there is a similarity between positionally-determined allomorphs and irregularly-inflected lexical items. Word formation theories require some notion of "blocking" to account for irregular inflection: for example, in Lexical Phonology irregular word formation processes precede the more regular processes, thereby blocking "by pre-emption" the application of the later, more productive process. In much the same way, the more specific phonological matrix of an allomorph -- i.e., the matrix containing a contextual specification -- "pre-empts" the less specific (context-less) matrix. Thus doo has precedence over hedai when the sentential location of the gf-bundle meets its (doo's) context.
3. For clarity, I will label each vowel with the tone assigned to it, although I still maintain following Hale that the tones are actually spreading in some instances (cf. (11)).
4. We will see below that specifiers of all categories are outside the intonational domain, and therefore cause a break in domain within the phrase.
5. In terms of Balin's (1977) landing site theory, rule (31) moves X' to the left periphery of the sentence. Rule (32) moves AUX rightward to a perhaps unusual landing site: rather than moving AUX to the left periphery of VP (here V'), it moves AUX immediately after the first element on that V' periphery. I take this slight modification in the landing site to reflect the requirement that AUX be in sentential-second position.
6. However, the one prefix which is stressed seems not to obey the constraints discussed in the text. When na appears in a sentence, e.g.,

$\begin{array}{ccccccc} \text{H} & \text{H} & & \text{H} & \text{H} & & \text{HL} \\ \text{Ná} & \text{á} & \text{ş} & \text{c} & \text{ík} & \text{pán} & \text{g Húan.} \end{array}$
 (na-AUX-3:reportative work:imperf art John)
 'John must be working'

where ná is stressed, the intonation mirrors that of a Q-initial sentence: a single domain extends over the sentence until V. This is a problem for my analysis. It could be, however, that all AUX (prefixes or not) move into V', when V' immediately follows. However, only prefixless AUX inverts with the leftmost constituent of V'. This would yield the right result for ná'áş. Note that even prefixless AUX fails to invert with future o and yet it can be argued that there is a single intonation contour in sentences containing a sentence-initial (prefixless) AUX followed by o, cf. (33). This is an issue for further research.

7. The suffix -aj appears on certain nouns when the specifier of those nouns is postposed. Of the two word orders seen in (50), the one on the right hand side of (59) (i.e., where N' is postposed) are preferred.

8. Koopman (in preparation) and Sproat (1983) have independently suggested that the directionality of government is a parameter for languages. Koopman points out that on the theory in which government is directional, it follows that the phrase structure rules need not specify the head position in an X-bar schema. Sproat derives the effects of certain instances of consonant mutation in Welsh in an analysis of Welsh VSO order and directional government.

9. P''' can also extrapose; I have simply limited my examples to N'''.

CHAPTER FOUR: PREPOSITION-ARTICLE FUSION

4. Preposition-article fusion. Another area of syntactic- morphophonological interaction is the phenomenon of fusion between prepositions and articles.¹ In Spanish, fusion is limited to the prepositions de 'of' and a 'to' and the definite article el. The fusion of prepositions and articles in Brazilian Portuguese is considerably more widespread than that which occurs in Spanish, and it extends to fusion between the prepositions de, a and all deictics. Fusion in French, on the other hand, is restricted to only some occurrences of the definite article le, les following de or a. This data on fusion in the Romance language compares with Irish preposition-article fusion as follows. As in the Romance languages, fusion in Irish often has a phonological effect on the lexical items involved. Unlike these other languages, however, preposition-article fusions in Irish phonologically influence the shape of the noun they precede, as well, such influence being manifested as an initial consonant mutation.²

In this chapter I will examine cases of fusion from all of the languages named above. I will offer an analysis of fusion grounded in the grammatical model of this dissertation, and discuss how fusion differs from the process of merger articulated in Chapter 2. I turn first to preposition-article fusion in Spanish.

4.1.1 Spanish preposition-article fusion. El in Spanish is the form of the definite article which co-occurs with masculine singular nouns, as in

- (1) a. el hombre alto
(art man tall)
'the tall man'
- b. el país hermoso
(art country beautiful)
'the beautiful country'

El also appears in conjunction with feminine singular nouns beginning with stressed /á/:³

- (2) a. el agua clara
(art water clear:fem)
'the clear water'
- b. el hacha (/áça/) pequeña
(art ax little:fem)
'the little ax'

All other feminine singular nouns co-occur with la, rather than el:

- (3) a. la alumna (/alúma/) alta
(art student:female tall:fem)
'the tall (female) student'

- b. la ciudad hermosa
 (art city beautiful:fem)
 'the beautiful city'

When feminine adjectives beginning with stressed /á/ are used as nouns, the article form is la.

- (4) la alta
 (art tall:fem)
 'the tall (one:fem)'

This data shows that el is associated with two distinct gf-bundles:

$$\begin{bmatrix} +\text{def} \\ +\text{masc} \\ +\text{sg} \end{bmatrix} \quad \begin{bmatrix} +\text{def} \\ +\text{fem} \\ +\text{sg} \end{bmatrix}$$

the gf-bundle on the right restricted to the phonological context $\text{---}[_{N\acute{a}}X]$. In terms of the grammar under development in this dissertation, Pl inserts el -- and not la -- in the context of a stressed /á/-initial feminine noun. I assume that some kind of checking procedure will insure that whenever the contextual specification for a particular phonological matrix is violated, the sentence will be rejected. Examples (1) - (4) show that Pl is sensitive to the phonological environment into which it places phonological matrices.

Él⁴ is linked to a third (related) gf-bundle: that of the masculine third person singular pronoun 'he'.

- (5) a. Él es mi amigo
(he be:3sg my friend)
'He is my friend'
- b. Pienso en él
(think:1sg in he)
'I think about him'

The various gf-bundles associated with the phonological shape el are listed in (6).⁵

- (6) a. $\begin{bmatrix} +\text{art} \\ +\text{def} \\ +\text{masc} \\ +\text{sg} \end{bmatrix}$ b. $\begin{bmatrix} +\text{art} \\ +\text{def} \\ +\text{fem} \\ +\text{sg} \\ \vee \text{---} [\acute{a}x_N] \end{bmatrix}$ c. $\begin{bmatrix} +\text{pron} \\ +3 \\ +\text{masc} \\ +\text{sg} \end{bmatrix}$

As an article in a prepositional phrase, el fuses with a preceding de 'of' or a 'to'.⁶

- (7) a. el sombrero del hombre
(art hat of-the man)
'the man's hat'

- b. el sonido del agua
(art sound of-the water)
'the sound of the water'
- c. Hablamos del examen
(Speak:1pl of-the test)
'We are speaking about the test'
- d. Escuchan al profesor
(listen to-the professor)
'They listen to the professor'
- e. Voy al cine
(go:1sg to-the movies)
'I'm going to the movies'

However, pronominal él does not fuse with the preposition:

- (8) a. el sombrero de él
(art hat of he)
'his hat'
- b. Hablamos de él
(speak:1pl of he)
'We are speaking of him'
- c. Lo escuchan a él
(obj-clitic listen to he)
'They listen to him'

Fusion does not occur with other articles or with any pronouns in Spanish. Notice that fusion is distinct from the effects of allegro speech, wherein some vowels may be elided when a string is spoken very rapidly. Such elision is optional, and the vowels are fully pronounced when spoken at slower speeds. In contrast, even in very slow speech, the fused forms del, al are obligatory.

Example (8) shows that the process which fuses de and el is sensitive to the [+arɪ] feature found in two of the gf-bundles to which el is linked. The fact that de - el fusion occurs regardless of whether el surfaces because it is the masculine article or because it is a contextually-specified allomorph of the feminine article (compare (7.a) and (7.b)), means that fusion is insensitive to the gender feature which distinguishes these two gf-bundles.

In the next section I will introduce similar data from Portuguese.

4.1.2 Preposition-article fusion in Portuguese. Fusion occurs between several prepositions and articles in Portuguese.⁷ All gender/number combinations of the definite article paradigm fuse with prepositions, not only the masculine singular member as in Spanish. The table below lists the prepositions which fuse and the resulting forms.

(9) a. de 'of'

de + o --> do
 $\begin{bmatrix} +\text{masc} \\ +\text{sg} \end{bmatrix}$

de + a --> da
 $\begin{bmatrix} +\text{fem} \\ +\text{sg} \end{bmatrix}$

de + os --> dos
 $\begin{bmatrix} +\text{masc} \\ +\text{pl} \end{bmatrix}$

de + as --> das
 $\begin{bmatrix} +\text{fem} \\ +\text{pl} \end{bmatrix}$

b. em 'in'

no na

nos nas

c. a 'to'

ao \ a^o

aos \ as

d. por 'for'

pelo pela

pelos pelas

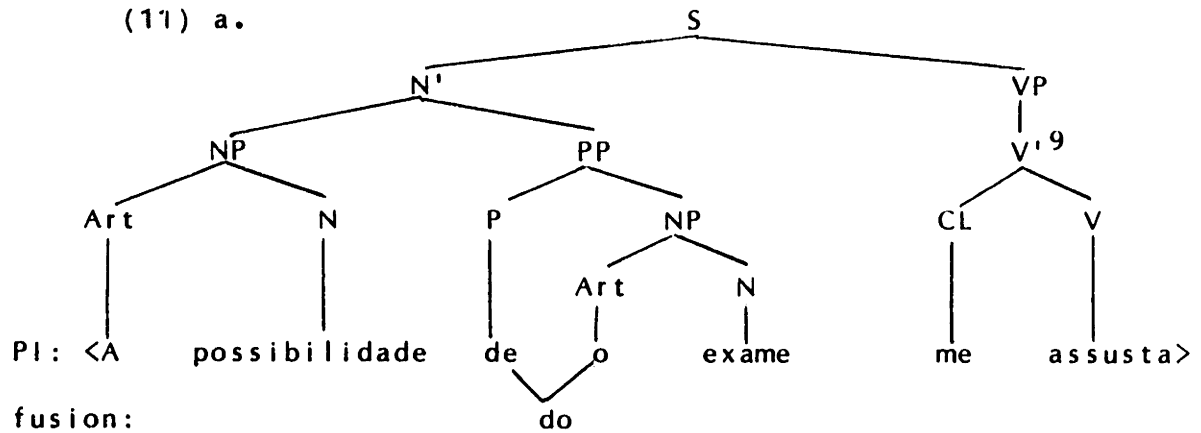
In the discussion which follows I will use examples of fusion between de and o; my remarks will extend to the others as well.

Each member of the definite article paradigm is isomorphic to the accusative clitic corresponding to the gender/number features of the article.

- (10) a. Ela chamou o menino
(she call:past art boy)
'She called the boy'
- b. Ela o chamou
(she obj:masc/sg call:past)
'She called him/it'
- c. Ela escreveu as carta
(she write:past art letters)
'She wrote the letter'
- d. Ela as escreveu
(she obj:fem/pl write:past)
'She wrote them'

There are distinctions in the gf-bundles corresponding to the articles and the clitics, although they share a phonological shape. Of interest to this discussion is the fact that the article -- but not the clitic -- fuses with prepositions, such as de.

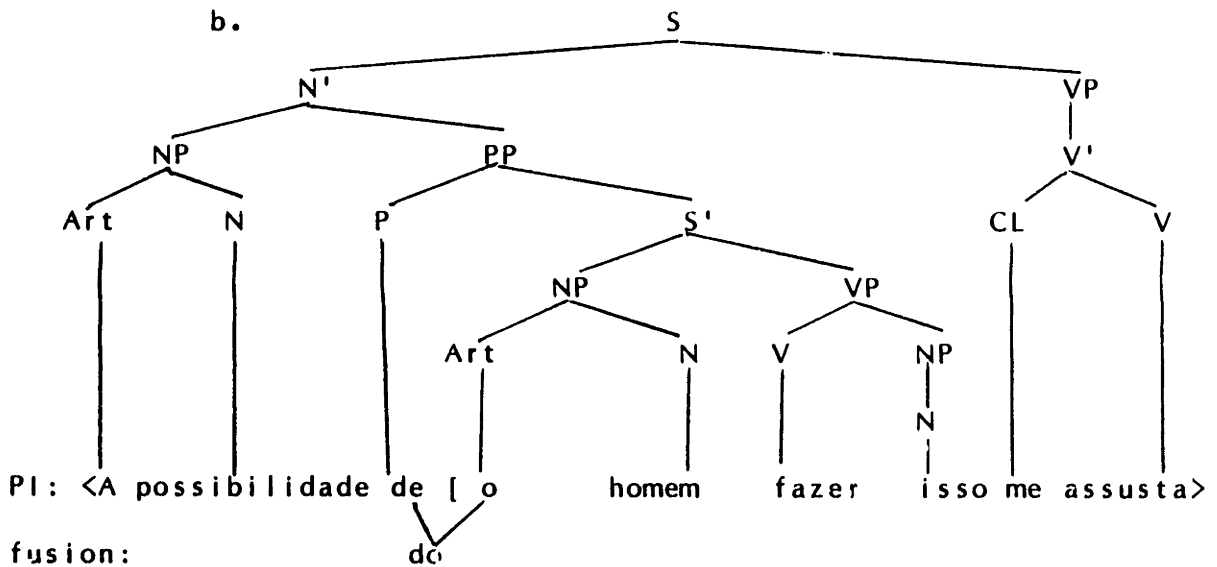
(11) a.



(art possibility of-the exam me frighten:3sg)

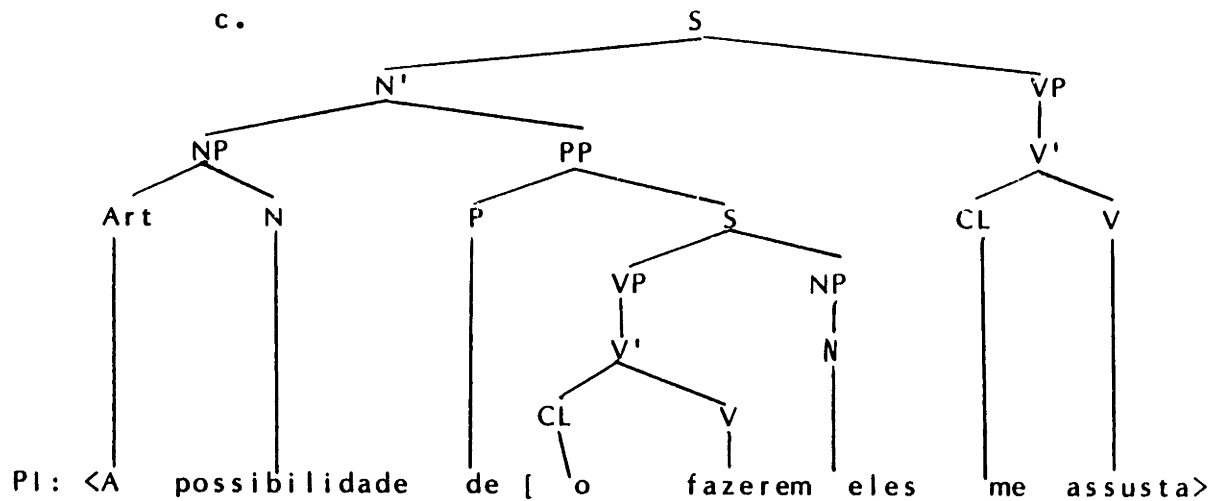
'The possibility of the exam frightens me'

b.



(art possibility of-the man do that me frighten:3sg)

'The possibility of the man's doing that frightens me'



*fusion:

*do

(art possibility of obj:masc/sg do:3pl they:masc me frighten:3sg)

'The possibility of their doing it frightens me'

+De fuses with the definite article o in a simple PP, as in (11.a), as well as across an S' boundary, as in (11.b). But there is no fusion of de with the isomorphic accusative clitic o. This distinction is possible because fusion has access to syntactic as well as phonological information. All that is required for fusion of the preposition and article to take place is the linear sequence



regardless of the syntax involved. No grammatical relations between preposition and article are relevant for fusion.

4.1.3 Fusion in French. The last Romance language case of preposition-article fusion to be considered here is that of French. In French, as in Spanish, the prepositions de and a fuse with the masculine singular form of the definite article (le) to create du and au, respectively.

- | | | |
|------|----------------------------|---|
| (12) | le garçon
(art:sg boy) | du garçon, au garçon
(of-the:sg boy), (to-the:sg boy) |
| | la femme
(art:sg woman) | de la femme, a la femme
(of-the woman), (to the woman) |

Unlike Spanish, however, the prepositions in French also fuse with the plural form of the definite article, producing les and aux.

- | | | |
|------|------------------------------|--|
| (13) | les garçons
(art:pl boys) | des garçons, aux garçons
(of-the:pl boys), (to-the:pl boys) |
| | les femmes
(art:pl women) | des femmes, aux femmes
(of-the:pl women), (to-the:pl women) |

Furthermore, fusion in French occurs not only before a noun, but also before an adjective within the NP:

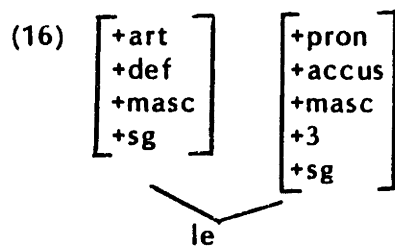
- | | | |
|------|-------------------------------------|--|
| (14) | le petit garçon
(art little boy) | du petit garçon
(of-the little boy) |
|------|-------------------------------------|--|

Fusion is restricted to instances of the full sequence le or les. When le precedes a vowel-initial noun, it elides to vowel-less l': l'enfant 'the child (masc.)'. If such elision occurs, fusion does not take place.

(15) l'enfant de l'enfant (*du enfant)

Therefore fusion of a preposition with le must be restricted to the environment: /___ # C, where '#' is a word boundary.

Le, les are isomorphic to the masculine singular and the plural accusative clitics, respectively, as is the case with Portuguese o. I assume as before the existence of two distinct gf-bundles, each linked to the same phonological matrix le (exemplified below) or les:



When the clitic is present, rather than the article, no fusion takes place.

(17) la possibilité de le voir . . .

(art possibility of him see)

'the possibility of seeing him'

*la possibilité du voir

The French case is thus quite similar to those of Spanish and Portuguese. I proceed now to a unified treatment of these facts by the fusion proposal articulated in the next section.

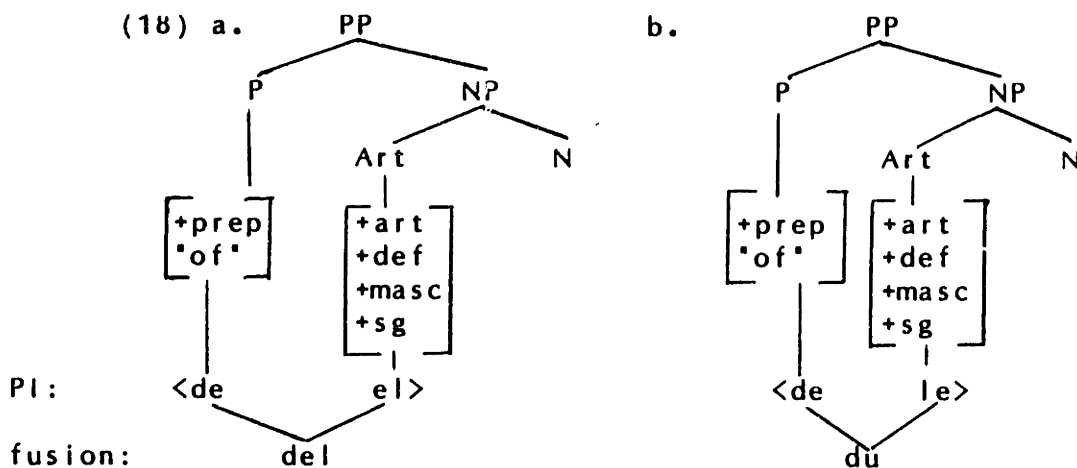
4.2 The fusion proposal. As I asserted in Chapter 2, I understand phonological matrix-insertion ('PI') to occur at PF, that is, after merger at s-structure. PF is defined as that part of the derivation of a sentence concerned with the phonological character of the sentential constituents. PI defines the PF-phase of the derivation process by making available to each gf-bundle a particular phonological matrix, as designated in the lexical entry of each item, in accordance with any contextual specifications that may be applicable. By this association of the phonological matrix, the gf-bundle of the syntactic processes gains "word" status.¹⁰

Once PI has taken place and phonological information is available to the sentence, the processes described as "post-lexical phonology" (cf. Kiparsky (1982a)), along with stylistic rules, etc., occur. One of the last processes to occur at PF is fusion, to which I now turn.

Fusion is a phonological "readjustment" rule, of sorts; it gives a new phonological shape to a sequence of words in the sentence. Fusion is sensitive to the gf-bundle of words. I have discussed cases which demonstrate that a particular syntactic role is often required of a word in order for that item to undergo fusion to another word. For example, in Portuguese only the definite article, and not the phonologically identical object clitic, can fuse with the preposition. Notice, however, that grammatical relations between fusing constituents are not necessary. Again citing Portuguese, recall that the definite article fuses with de whether it is the specifier of an NP that is the exhaustive object of de, or the specifier of an NP embedded in a sentential object of that preposition. I will discuss a similar case in Irish in section 4.3 below.

Fusion is at the same time sensitive to the phonological environment of a string of words, as seen in the case of French le, where fusion with de occurs only when the following word is consonant-initial. The fact that fusion has access to both gf-bundles and phonological information follows from the theory, because it locates fusion after Pl.

I envision fusion as pictured below for Spanish del and French du.



Nothing happens to the gf-bundles of the items which fuse. Rather, fusion readjusts the phonological representation of the string. The fused form is not a lexical item; it is a 're-spelling' of a sequence of items. Fusion rules are stipulated by the grammar of the language, and these rules specify which words may fuse together. In this sense, fusion rules are similar to merger rules in that both are language-specific and can concern particular strings of gf-bundles (in the case of merger) or strings of phonologically constituted words (in the case of fusion).

However, beyond this similarity in type of rules, merger and fusion are quite distinct processes. As a result of merger, the gf-bundles of two independent lexical items combine together into a single complex. In the case of fusion, the gf-bundles of the two words which fuse remain independent from one another. Fusion reshapes the phonological character of a string of words without affecting the gf-bundles of those words.

Merged forms are members of the categories of one of their constituents; fused forms have no specific lexical category. In fact, fused forms like del are not lexical items at all. They are not listed in the lexicon; they are late-level phonological idiosyncrasies. They are always understood to be "contractions" of some sort, rather than "regular" words. There is a correlation between the lack of categorial status of fused words, and the location of fusion at PF. The combination [Prep+Art] is not a possible lexical category;¹¹ however, the combination of two categories into a single lexical item is not surprising of a PF rule, a kind of rule generally held to capture stylistic oddities of the language. Merger, on the other hand, never gives rise to "impossible" or "nonexistent" categories. This follows from the constraints on merger to the effect that only certain categories bearing specific grammatical relations to each other may merge.¹²

Merger involves only gf-bundles, while fusion uses both grammatical and phonological information. This follows from the location of each of these processes within the organization of the grammar. Merger occurs at s-structure, where phonological information is not available. Fusion, in contrast, takes place after PI has coordinated phonological matrices with their gf-bundle counterparts; therefore both kinds of information are accessible. Notice that on this model the effects of merger are available at LF, since merged gf-bundles are created at s-structure and thus feed into LF. However, the effects of fusion are not accessible to LF, because the site of fusion, PF, is isolated from LF. This makes a certain prediction about the semantic interpretation of the sentence: semantic

interpretation cannot include the effects introduced into the sentence via fusion. I leave this as an open question for further research.

There is striking evidence in Irish that merger and fusion are distinct operations. Prepositional inflection, discussed in Chapter 2, is an example of merger between the preposition and its pronominal object. I will argue in the next section that prepositions fuse with, rather than merge with, a following definite article, and that this fusion forms a preposition-article unit capable of inducing initial-consonant mutation on a following noun.

4.3 Preposition-article fusion in Irish. Initial consonant mutation in Irish is the phenomenon wherein a particular morphological or syntactic context influences the phonological shape of the initial consonant of a given word. There are two principal types of mutation in Irish, lenition (i.e., aspiration in the traditional terminology of Irish grammars), and eclipsis (or, nasalization). Eclipsis nasalizes voiced consonants and voices voiceless consonants, and is orthographically represented by the eclipsing consonant written before the unmutated citation form consonant. Lenition changes stops to fricatives, and lenited fricatives become glides or disappear entirely. Lenited consonants are indicated orthographically by a following h. Massam (1983) discusses the phonological and morphological aspects of mutation at length, and the reader is referred to her paper. I will be concerned here only with a certain array of data involving mutation in prepositional phrases.

Mutation occurs between some forms of the definite article and its nominal head. Nongentive feminine singular articles lenite the initial consonants of their nouns. So do genitive masculine singular articles. Genitive plural articles eclipse the first consonant of the nouns which follow them. These facts are captured in the table below.

(19)

	nongentive	genitive
M sg	∅	lenited
F sg	lenited	∅
pl	∅	eclipsed

Some prepositions also affect immediately following nouns. The preposition i 'in' eclipses the initial consonant of the noun that is its argument. Members of the class represented by faoi 'under' lenite the initial consonant of a following noun, and a third group of prepositions, such as le 'with', does not affect the initial consonant of following nouns.

In the configuration [P [Art N]], where N is singular, a third pattern of mutation emerges. There is significant dialectal variation on the form of the mutation. The types of mutation for three dialects are presented below: Ulster, used in most of the examples here, County Galway, as represented by Cois Fhairrge (the most widely documented of this dialect), and Munster, very similar to the standard.

In [P [Art N]], where P =	Ulster	Galway	Munster/ standard
faoi, le	lenite	eclipse	eclipse
de, do	lenite	lenite	lenite
i	lenite	eclipse	lenite (except for /f/, which eclipses)

In Ulster, the initial consonant of all singular nouns in the configuration [P [Art N]] are lenited. In Galway, the initial consonant of nouns following the prepositions de, do are lenited, but all other prepositions article combinations cause eclipsis of the noun's initial consonant. Finally in Munster/standard, eclipsis of the first consonant of the noun occurs only with the preposition classes represented by faoi and le, lenition occurs otherwise, with the exception of an /f/-initial noun, which eclipses.

Often the string P Art in the context [P [Art N]] exhibits a new "combined" form, by which I mean a form that arises only when these two are in together before N in a prepositional phrase. This combination form is not consistently written as a single word; Irish orthography does not always reflect actual word boundaries. The combination forms for various preposition-article strings are listed below.

- (20) [i [an --> san
[de [an --> den
[do [an --> don
[o [an --> ón
[le [an --> leis an

I take these phonological changes as evidence that preposition-article fusion occurs in Irish.

Consider the sentences in (21).

- (21) a. Níor fhan sí leis an [mbróg a thógail].
bhróg¹³
(neg wait:past she with art shoe to pick-up)
'She did not wait to pick up the shoe'
- b. Níor fhan sí leis an [mbuachaill a fheicéail].
bhuachaill
(neg wait:past she with boy to see)
'She did not wait to see the boy'

In the eclipsing dialect, the initial consonants of both the feminine nongenitive mbróg and the masculine nongenitive mbuachaill are eclipsed in the PP headed by le, despite the fact that singular masculine nongenitive articles (when not in a PP) have no effect on the initial consonant of the following noun. Note that

le immediately appearing before a noun also does not affect the initial consonant of that noun. Yet when the preposition and the article appear in a linear sequence before the noun, they eclipse the initial consonant of that noun. In the Ulster dialect lenition takes place instead of eclipsis, but the facts are identical: alone, neither the preposition le nor the masculine singular article has an effect on the noun, but when the two are combined the resulting sequence lenites the initial consonant of the noun.

McCloskey (1980) has shown that the sequences set off by brackets in (21) are sentential constituents and that the NP is not raised into the matrix clause. This is significant because it shows that the fusion of preposition and article in Irish applies to any [P [Art N]] sequence, regardless of the sentential boundaries involved.

Contrast the sentences in (21) with similar sentences involving a pronoun as the NP in the sentence that is the object of a preposition. Recall that in section 2.2.2 above I discussed the merger of a preposition with its pronominal object.

- (22) a. Níor fhan sí le [í a thógáil].
 (neg wait:past she with it(fem) to pick-up)
 'She did not wait to pick it up'

- b. Níor fhan sí le [é a fheichéail].
 (neg wait:past she with him to see)
 'She did not wait to see him'

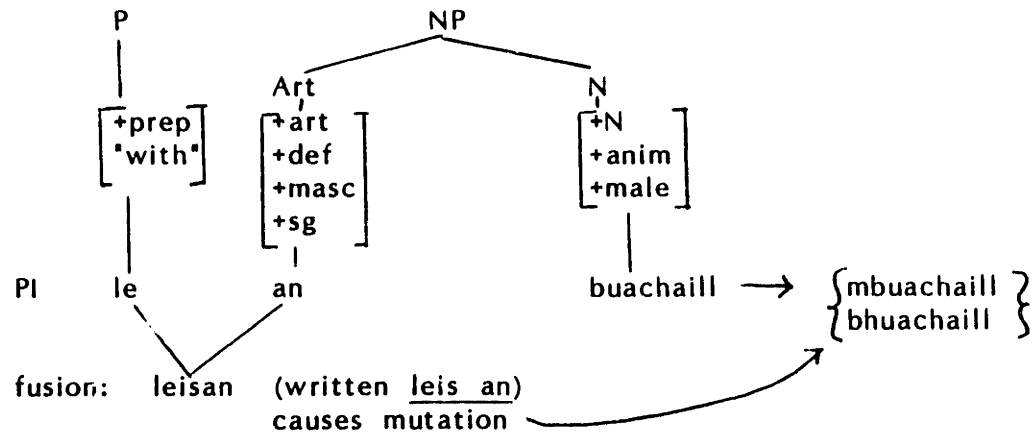
Merger cannot take place in Irish across an S' boundary. It occurs only when the pronominal object of P is the exhaustive object:

- (23) a. Níor fhan sí léi.
 (neg wait:past she with-her)
 'She did not wait for her'
- b. Níor fhan sí leis.
 (neg wait:past she with-him)
 'She did not wait for him'

Preposition-article fusion, then, contrasts with merger of a preposition and its pronominal object in that fusion, but not merger, can occur across a sentence boundary. This fact, coupled with the mutation behavior of preposition-article strings, supports the notion that fusion is a phenomenon distinct from merger.

I assume that fusion in Irish happens as I suggested for Spanish and French above. When PI occurs, it associates the phonological matrices with the gf-bundles shown:

(24)



Fusion readjusts the string *le an* to *leis an*. The superstructure dominating the *P Art N* sequence is irrelevant; fusion occurs in any instance of this sequence. Notice that fusion must occur before mutation, in order to create the unit preposition-article, which I take to be the cause of the mutation on the noun.¹⁴

In conclusion, we have seen the Irish provides support for the fusion notion. The distinction in behavior between preposition-article complexes, and preposition-object complexes argues for two different phenomena involving combinations of lexical items.

4.4 Concluding remarks. In this dissertation I argued that the traditional notion of lexical insertion into a d-structure constructed by a separate categorial component of the grammar improperly conflates two independent processes. The first of these is what I called CC, whereby gf-bundles are projected from the lexicon to form a phrase marker. The second is PI, which

contributes to the sentence the phonological matrix associated with each gf-bundle in its lexical entry. PI, by providing these matrices, delimits that part of the sentential derivation in which phonological, together with grammatical, information is accessible.

The grammar described above is augmented by two processes which allow the consolidation of a string of sentential constituents into a single lexical item. The first, merger, occurs at s-structure, incorporating the gf-bundles of two linearly adjacent items into one composite bundle. During PI, the composite gf-bundle will be associated with its phonological matrix, resulting in what is often called an "inflected form" of some sort.

The second process introduced is fusion, which takes place in PF, after PI makes phonological information available. Fusion is a readjustment process which rewrites certain sequences of items as a single word. Like merger, fusion requires linear adjacency of the items to be fused.

Merger and fusion were shown to be distinct processes operating at different places in the grammar. Merger requires certain grammatical relations between the constituents, while linear adjacency of the constituents -- without regard for intervening category boundaries -- is often sufficient for the operation of fusion. Merger involves only gf-bundles; fusion has access to both the gf-bundles and the phonological matrices of the constituents. This distinction follows from the organization of the grammar: at s-structure, where merger takes place, no

phonological information is available. On the other hand, fusion occurs after the introduction of phonological matrices via Pl.

The critical example distinguishing merger from fusion was presented in the preceding section, where Irish preposition-article fusion was compared to the merger of prepositions and pronominal objects in Irish (this latter described in section 2.2.2 above). I showed that fusion occurs across an S' boundary, but that merger cannot. The merger of a preposition and its pronominal object is limited to the exhaustive object of that preposition. Fusion, in contrast, takes place whenever the preposition is followed by the article.

1. Preposition-article fusion is only one kind of fusion. I predict that fusion is generally confined to closed-class or small, grammatical class items, like prepositions and articles. For example, I understand the 'contraction' of pronouns with various particles such as the reflexive fein, etc. in Irish to be the result of fusion.

2. Cf. Massam (1983) for a discussion of Irish initial-consonant mutation.

3. There are a few lexical exceptions to this generalization. The name of the first letter of the alphabet, /á/ 'a' and also /āčē/ 'h', are referred to with the la allomorph of the article: la a, la h. La hada 'the fairy' and La Haya 'the Hague', both with initial stressed /a/, are also (lexical) exceptions. I assume that the lexical entries for the nouns in these cases carry some diacritic that overrides the expected el form of the article, and forces the appearance of la. What is important here is that it is the noun, and not anything to do with the lexical entry for la, that determines the exceptionality.

This point was suggested by Jim Harris.

4. This occurrence of el is distinguished orthographically by a written accent. The pronoun el is stressed.

5. I assume that some co-indexing mechanism identifies the masculine article el and the feminine article allomorph el as the same phonological matrix.

6. When the object of de is a sentence, as in

De ganar la carrera el campeón . . .
(of win art race champion)
'If the champion wins the race . . .'

inversion of the subject, as in (i), is highly favored. However, it is possible, albeit marked, to have the subject precede the verb, in which case de does not fuse with el:

De el campeón ganar la carrera . . .

This was pointed out to me by Mario Montalbetti. This fact distinguishes Spanish from Portuguese (cf. (11.b) in the text). Thus the rule for Spanish must specify that fusion cannot take place across an S' boundary.

7. Fusion in Portuguese occurs also with prepositions and strong forms of subject pronouns: de ele 'of he' --> dele. Prepositions fuse, furthermore, with demonstratives, as in em isso 'in that' --> nisso; with indefinite articles: de uma 'of one:fem' --> duma, etc.

8. Again, fusion can be distinguished from allegro speech phenomena because it is obligatory, even under conditions of slow speech.

9. I follow Grimshaw (1980) in the expansion of $V' \rightarrow (CL) V$.
10. By "word" status I mean that the full lexical item -- gf-bundle, phonological matrix and meaning -- has come out of the word formation component.
11. Cf. Chomsky (1981) for a discussion of possible categories.
12. Cf. section 2.1.3. above for a discussion of merger.
13. The first member of each pair shows the effect of mutation in the eclipsing dialect (Munster, Galway, and the standard). The second member is the lenited counterpart in the Ulster dialect.

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