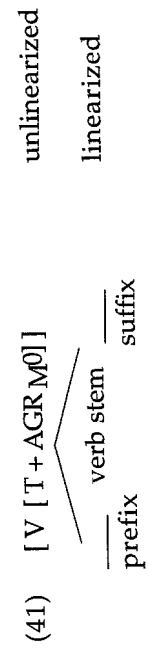


undefined unacceptably vague, and even when defined explicitly, prone to endless misinterpretation. The unlabelled constituents as in (38) I will call morphosyntactic constituents, or M^0 s. The reader is advised to take careful note of this. As used in this work, M^0 is not the same as X^0 except in the default instance, nor is it the same as position of exponence, nor is it the same as an affix (strings, autosegmental tones, etc.) or set of affixes which occupy a position.

0.2.1.1 Splitting of M^0 s

The Arabic case is then complicated by the fact that the M^0 INFL *splits* phonologically into two positions of exponence: prefix and suffix. The diagram below schematizes this process:



The crucial point of the Arabic example is that X^0 s and positions of exponence (the prefix and suffix positions) are not isomorphic. It is misleading to conflate them. While some languages display a certain isomorphy or near-isomorphy between what may be postulated as syntactic heads and positions of exponence (so-called "agglutinative" typology), this need not be the case. In this study, I will be developing a theory which pays strict attention to the degrees of divergence of syntactic objects (X^0 s) and the positions of (principal) exponence for the features carried by X^0 s. It will be my contention that isomorphy between X^0 s and positions of exponence is the default situation, complications of which must be expressed by additional stipulations of grammar, most typically constraints on morphological well-formedness as described in section 0.1.1.

For example, I will be arguing that in Arabic, the prefix and suffix positions are demanded by the V+INFL constituent as part of its *autonomous word structure*. These positions are required solely by conditions of *morphological well-*

formedness. The positions must be filled by phonological material (including contentful \emptyset as in the jussive mood), in order for the constituent to become a well-formed word. The positions are the analogues to the Qs of Halle's model, described in section 0.1.1.1. Crucially, however, in the present theory Qs are isomorphic to X^0 s only in the default case. Additionally, as I will show, the prefix and suffix positions are separate elements: the Arabic tense/agreement "morpheme" is not simply a circumfix or circumfix that splits into two pieces, encircling the stem. Rather, the prefix and suffix are realized separately and interactively.

A more complete analysis of Arabic (and many other Afroasiatic languages) will be undertaken in chapter 1. In chapter 3 I show that autonomous word structure may be of three sorts: (1) strictly licensing, as in Arabic, where specific positions in excess of the number of M^0 s are required for well-formedness; (2) unmarked, where there is isomorphy between M^0 s and stems/affixes; and (3) freely licensing, where M^0 s are "liberated" such that they split into indefinitely many non-obligatory positions.

Of course, it may seem entirely redundant that T and AGR are assembled by Merger/Fusion, and then split again into two affixes. Why not indeed postulate a single syntactic projection INFL? Since the primary focus of the present work is not on the arguments for or against expanded INFL, I merely note here that both Merger/Fusion and Splitting are permitted on the current proposal. Expanded INFL is convenient and possibly correct, insofar as the syntax of expanded INFL projections is isomorphic to the syntax of the phonological pieces which are the (principal) exponents of these projections, as argued by Giorgi & Pianesi for Latin (and Italian). Insofar as INFL remains atomic morphologically (fused, or fused and then variously split again, as in Arabic), a hypothesized expanded INFL must either be assembled by Merger in morphology, or not postulated in the first place. For now I leave this question open.

0.2.2 Capturing Systematic Neutralizations

It is a quite obvious fact that some languages morphologically express more morphosyntactic properties than others. To give a simple example, verbs in Semitic express the gender of the subject in some person-number categories, while this is typically not the case in Indo-European. Similarly, it is easily observed that whatever morphosyntactic properties are available for a category such as Verb rarely cross-classify fully with each other. For example, gender in classical Arabic is never distinguished for 1st persons, nor for 2nd person dual categories. The paradigm below illustrates these neutralizations:

(42) The Arabic Prefix Conjugation (Imperfect Indicative)

k t b 'write'

singular	dual	plural	
<i>y-aktub-u</i>	<i>y-aktub-aani</i>	<i>y-aktub-uuna</i>	3m
<i>t-aktub-u</i>	<i>t-aktub-aani</i>	<i>y-aktub-na</i>	3 f
<i>t-aktub-u</i>	<i>t-aktub-aani</i>	<i>t-aktub-uuna</i>	2m
<i>t-aktub-iina</i>	*	<i>t-aktub-na</i>	2 f
<i>?-aktub-u</i>	*	<i>n-aktub-u</i>	1

(I will be presenting the paradigms with 3rd person at the top, in the fashion traditional to Semitic studies.)

In (43) I list some facts about the paradigm above:

- (43) a. There is no gender distinction in the 1st person.
- b. There is no dual number in the 1st person.
- c. There is no gender distinction in the 2nd person dual.
- d. There is no 1st person inclusive vs. exclusive.
- e. The 3rd fem and 2nd masc are the same in the singular and dual.
- f. Gender is masculine or feminine but never neuter.

While each of these facts holds of the paradigm, it would be incorrect to attribute all of them to the same grammatical

mechanism. In what follows, I will make explicit the different ways in which these generalizations are encoded.

A number of issues are at play here. We can take care of the generalization in (43e) immediately: it results from a homophony of the prefixes *t-'2'* and *t-'fem.'* Aside from this accidental homophony, the other syncretisms are more systematic.

0.2.2.1 The Feature Alphabet and the Category Alphabet

Each language must possess a set of morphosyntactic features such as person, number, and class features of various kinds, including sex-based gender and grammatical gender-class (including such properties as physical shape, deixis, animacy, whether real or classificatory, and even phonological shape (Aronoff 1992)). Just as the phonology of a language picks out certain of the set of universal phonological features to be active in defining its lexical alphabet of segments, so too must a language pick out a set of morphosyntactic features. Some morphological features, such as features for conjugational class, may be language-specific, however.

How is this selection to be accomplished? Or, put more appropriately, how is such a selection learned by a child?

I will be following in large part certain assumptions made in work by Calabrese (1988, 1995) on the composition of phonological alphabets. Here the ideas he presents will be adapted with some modification to apply to what I will term a "morphological alphabet."

Calabrese's view is that Universal Grammar provides lists of features and feature complexes arranged in hierarchies according to their complexity. The hierarchies are actually defined as lists of feature cooccurrence restrictions, henceforth *filters*. When a child is provided with an auditory stimulus that a certain feature combination is phonologically active in a language, the filter which bars this combination is suppressed.

Acquisition evidence suggests that very young children acquire the phonological systems of their language by exposure to the clustering of sounds at certain acoustical positions. Research beginning with Eimas et. al. (1971) and Streeter

(1976) and fully developed in experiments carried out by Werker (1989), has revealed that infants perceive a highly articulated inventory of phonological distinctions, but, in response to speech in their environment, between the ages of 6 to 12 months, they lose the ability to perceive certain distinctions. For example, a child exposed to only English will lose the ability to distinguish retroflex coronals from alveodental coronals and aspirated from non-aspirated voiceless stops.

Acoustical clustering presumably provides the cue that certain distinctions are operative. For example, if the stimulus language makes a contrast between aspirated and non-aspirated stops, then the child will not hear sounds clustering at the border between the two, that is with voice-onset timing highly variable, but rather will hear clustering away from the acoustic boundary. This provides the clue that aspiration is distinctive within the sound system.

The youngest infants perceive a multitude of distinctions, that is, they are ready to perceive whatever distinctions may happen to be present in the speech environment. I hypothesize, therefore, that at different stages of very early development, (approximately 6–8 months) the filters postulated by Calabrese (1988, 1995) appear and are “suppressed” in the event that exposure to the relevant distinction has already occurred.

It is predicted, then, that the filter barring [+spread] from appearing with [+cons –cont] appears in infants at approximately 6–8 months and is suppressed in the infants that hear Hindi and not suppressed in the infants hearing English only.

A particularly surprising result of Werker (1989) concerns children who heard Hindi spoken in early childhood, whose first words were Hindi, but never went on to acquire Hindi fully and instead learned English as adults and remembered little or no Hindi in adult life. This group of subjects was found to perceive the aspirated/unaspirated distinction nearly as well as Hindi-speaking adults. This confirms the developmental hypothesis. The suggested conclusion is that a filter is presented once in infancy and if suppressed at that time, it is

never “unsuppressed” even if the filter is operative for other speakers in the adult-language speech community.

In a filter-based theory, certain implicational relations can be expressed as follows. It has been observed that no language distinguishes [ATR] for high vowels unless it distinguishes [ATR] for mid vowels. Similarly, no language distinguishes [ATR] for low vowels unless it also distinguishes [ATR] for nonlow vowels. Calabrese (1992:381) proposes the following (partial hierarchy):

- (44) *[-ATR -high]
 |
 *[-ATR +high]
 |
 * [+ATR, +low]

If the child’s stimulus is sufficient to suppress a filter, all filters above this filter are suppressed automatically as a consequence of UG. If a child perceives that [ATR] is contrastive for low vowels, then ATR must be contrastive for all heights. It follows that the burden of learning consists solely in finding that point on the hierarchy which is the complexity threshold, that is, the lowest filter which must be suppressed.

Converting these ideas into the realm of morphosyntax, I will assume that there exists a universal set of features for at least person, number, tense and aspect. Gender features (Corbett 1991) and the classification of verbal action called Aktionsart are possibly universally defined but show such variability and are so poorly understood that I will have little to say about these here.

Of the universal set of morphosyntactic features, some are active in a given morphosyntactic system, while others are inactive. Of the active features, not all will fully cross-classify with each other, giving the effect of “gaps” in inflectional paradigms. Filters account for such gaps.

Some of the facts cited in (43) for Arabic follow from the selection of active features while others follow from filters. (43e) — that Arabic verbs do not have an explicit neuter gender — follows from the choice of active features which combine lexically to form arguments and agreement heads in syntax.

On the other hand, since gender and dual number cross-classify with some but not all of the other categories, generalizations (43a-c) are better expressed as filters:

- (45) a. *[1 f] No 1st person feminine
 b. *[1 dual] No 1st person dual
 c. *[2 dual f] No 2nd person feminine dual
 d. *[1 2] No 1st person inclusive

I propose here that filters of this sort, like phonological filters, are part of UG and, at a certain developmental point, will be acquired automatically unless evidence is provided which contradicts them.

All four filters in (45) are active in familiar contemporary Indo-European languages, which have no gender in (most) verb forms, no dual, and no inclusive.

Consider now the 1st person feminine. This category must be both 1st person and feminine at the level of agreement, since an adjective agreeing with a feminine 1st person will appear as feminine:

- (46) ?ana mustaʕidd-at-un
 I prepared (fem)
 'I (f) am prepared' (Abboud & McCarus 1985:291)

A more familiar example would be the French alternation *Je suis heureux/heureuse* 'I am happy (m/f).'

Now given the filter in (45a), one should expect that the features [1] and [f] should never be allowed to combine. The facts of agreement however, show that syntactic structures are more fully specified than the differentiation of morphological forms would betray at first glance (cf. also Lumsden 1987, 1992).

To express this situation, I will assume that, of the features selected as syntactically active in a language, some are deleted at the input to Morphology. This process will be called *Impoverishment*, following Bonet (1991). I will be arguing in the next several subsections that *Impoverishment* occurs automatically in the first phase of Morphology whenever combinations of features violate filters such as those in (45). I will propose that a hierarchy of features determines which

feature(s) of the offending combination is deleted to assure well-formedness at Morphology.

0.2.2.2 Feature Hierarchies and Feature Trees

In the morphological realization of 1st person feminine V+INFL in Arabic, the deleted feature is [f] and not [1]. We know this because 1st person feminine V+INFL is not homophonous with 3rd person feminine V+INFL, as might be expected if [1] were deleted. (I will assume that 3rd person lacks a person feature specification in Arabic.) This deletion could be expressed by a rule as below:

- (47) f → ∅ / 1

However, the rule mechanism is too powerful to express this sort of systematic ambiguity, since it could just as easily express the opposite relation:

- (48) 1 → ∅ / f

Rule (48) would incorrectly render 1st person feminines homophonous with 3rd person feminines in Arabic.

Instead of rules of this type, I propose that the features in a filter are not simply unordered but actually are composed in a hierarchical structure. If 1 > f in this hierarchy, then by a principle, when the filter *[1 f] is activated (at Morphology), f and not 1 will be deleted.

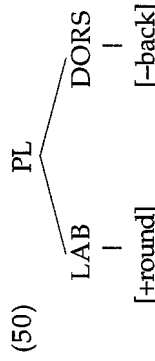
Moreover, if such hierarchies are represented graphically as tree structures, then the deletion of morphosyntactic features can be assimilated to *Delinking of autosegmental representations*, as first proposed by Bonet (1991):

- (49) AGR
 |
 1
 †
 f

For Bonet, Impoverishment is limited to Delinking, and the geometries she proposes are motivated to allow the permitted Impoverishments and no others. For example, using this same idea, 1 in (49) cannot be delinked unless *f* is also delinked. In accordance with the filter *[1 f], it follows that the minimal modification necessary to comply with the filter is delinking *f* only.

It is not obvious however, that the hierarchies which indicate which feature is deleted by Impoverishment are deducible from an invariant morphosyntactic feature geometry.

First consider an example from Calabrese (1992:390 ff.). Calabrese notes that the Italian pronunciations of German *führer* [fū:rər] vary between [firer], [furer], and [firer]. The former two cases are examples of delinking one offending feature in the filter *[+round -back]. If [+round] is deleted, the result is [i]; where [-back] is delinked, the result is [u]. (The third case represents breaking, discussed shortly). Following the Sagey (1986) model of feature geometry, Calabrese assumes the articulator-based feature geometry as below:



Since neither feature dominates the other, the restriction that filter violations must be repaired by delinking forces neither the choice of delinking [+round] nor the choice of delinking [-back].

We can conclude that while feature geometries in phonology express what sorts of delinkings are possible, feature geometries do not express which delinkings are necessary.

Consider all of the filters in (45) and their putative geometries. If in each case the hierarchy which determines which feature is to be deleted is expressed by the relation of dependency in a tree, we are led to postulate these structures:

(51) a. AGR | b. AGR | c. AGR | d. AGR |
 1 1 2 1
 | | | |
 f pl pl
 | | |
 dual dual
 | |
 f f

(I am assuming for now that dual is a subclass of plural, since 1st person dual neutralizes with 1st person plural, not singular). In each case, the hierarchy below holds:

$$(52) \quad 1 > 2 > \text{pl} > \text{dual} > f$$

Hierarchies of features such as the one above have been proposed before. For example, Silverstein (1976) proposes a similar hierarchy to explain the various types of split ergativity which may occur. Lumsden (1987, 1992) has also argued that hierarchies of features are necessary in any theory in which “the forms of inflection are underspecified.” In particular, Lumsden argues that the feature [±pl] must be higher than [±fem] in Romanian and suggests that this ordering “might be predicted on universal grounds” (p. 1992: 480). In this book, I propose that feature hierarchies of the sort suggested by Silverstein and Lumsden can be used to explain the direction of neutralization by filters, as well as the unmarked (least costly) order of morphological rules (chapter 1) and of affixes (chapter 3).

The idea that morphosyntactic features are not simply unordered lists is not at all new. In particular, Gazdar, Klein, Pullum & Sag (1985) (and references included there) experiment with morphosyntactic feature geometries within the theory of Generalized Phrase Structure Grammar. At this point, however, it remains unclear what purpose a morphosyntactic feature geometry should have aside from expressing hierarchies as in (52). As we have seen, the hierarchies that motivate delinking in phonology are independent of the dependency relation in phonological feature geometry,

It is possible to identify three competing criteria underlying arguments for feature geometries. First, and earliest, is Clements' (1985) proposal that only subtrees operate as natural classes of features for phonological rules. The node dominating the relevant subtree defines this natural class for autosegmental spreading. The second criterion is anatomical: the nodes dependent on PLACE in particular are associated in Sagey's (1986) model with specific articulators of the vocal tract; features associated with each such node (LABIAL, CORONAL, DORSAL) are solely executed by this articulator. Finally, the relation of dependency automatically encodes the property of contrastiveness. For example, the feature [±distributed] depends on CORONAL in the feature tree; therefore, [±distributed] can appear (be contrastive) only for trees which have the node CORONAL from which [±distributed] may hang. Crucially, however, not all matters of contrastiveness are encoded by the feature geometry. For example, the fact cited by Calabrese that [±ATR] is contrastive for high vowels only if it is contrastive for mid vowels is nowhere expressed by the geometry.

In the realm of morphosyntactic features, the first of these criteria has a translation. (At present I see no analogy to "morphological articulators.") Gazdar, Klein, Pullum & Sag employ this first criterion in constructing feature-geometries for morphosyntactic features (1985:21): "whole clusters of feature specifications [can] be picked out in a natural way if they share[d] a mother node in the graph." The idea that only subtrees operate as natural classes corresponds to the idea that (1) only subtrees may operate together as features of an affix and (2) only subtrees may be copied in Concord operations. (Only the latter usage is cited by Gazdar et. al.)

The first consequence makes wrong predictions immediately. Consider the Arabic verbs in (53) and the putative geometries of their AGRs in (54):

- (53) a. *t-aktub-na* 'you (f, pl) write'
 2-write-pl f
 b. *t-aktub-aani* 'they (f, du) write'
 f-write-dual

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- (54) a. AGR | b. AGR |
 2 | pl |
 | | |
 pl | dual |
 | | |
 f | f |

In (53a) the prefix expresses person while the suffix expresses number and gender. If the prefix *t-* is limited to being the principal exponent of some subtree of (54a), then it should be the principal exponent not merely of 2 but also of all the features which 2 dominates. Yet this is clearly false, since the suffix *-na* expresses f pl separately. Similarly in (53b), *f*, although dominated by dual, is realized as a separate affix.

On the basis of such examples, we must assume either that subtrees are not the natural classes of features which affixes may realize or that the putative geometries are incorrect.¹¹

As for the second consequence—that only subtrees may be copied in concord relations—this remains to be investigated and is more promising. For example, agreement with adjectives (in Arabic) copies only the subtree dominated by number, bringing any gender with it. I leave this topic open.¹²

The idea that the tree should express contrastiveness is ultimately linked to the idea that some phonological features are articulator-bound and therefore contrastive only when dependent upon that articulator. No obvious analogy with morphosyntax exists and complications arise immediately when this analogy is forced. For example, the hierarchy 1 > 2 predicts that 1st person inclusives merge with 1st person exclusives whenever there is a systematic ambiguity of these categories.¹³ Nevertheless, if the same dependency relation is held to express contrastiveness, then 2 should appear only when dependent on 1, or, put another way, 2 cannot appear without 1. Therefore, a simple 2nd person category should be impossible.¹⁴

To summarize so far, morphosyntactic feature trees express the hierarchies which determine which feature in a filter is deleted by Impoverishment, as summarized by the claim in (55) and the principle in (56):

(55) *Systematic Neutralization*

Systematic Neutralizations are the result of Feature Cooccurrence Restrictions (filters). Filters combined with feature hierarchies effect Impoverishment.

(56) *Impoverishment*

Given a filter of the form *[aF bG], delink that feature which is lower on the hierarchy of features.

Any theory of morphosyntactic feature geometry is in its infancy at this point. Whether there is in fact a convergence of the criteria of natural classes for rules and of hierarchy for neutralization is far from settled. For the purposes of the present study, I will be assuming that hierarchies exist among morphosyntactic features, but remain uncommitted as to whether geometric representation of this hierarchy is in any way useful or valid.

0.2.2.2.1 *Filters are not Constraints on the Content of Affixes*

The filters necessary for conditioning the neutralization of categories are not simply constraints on the content of possible affixes, but rather are constraints on the features borne by M^0 s as a whole.

To see this, consider the constraint *[1 dual] in Arabic. Let us suppose momentarily that this constraint does not hold of the INFL complex as a whole but rather holds only of possible affixes. In other words, there can be no affix bearing both the features [1 dual]. It is a mistake to suppose that this interpretation of filters ensures the correct neutralizations, as I now show.

Whenever an M^0 splits into two positions of exponence, it is possible that the features barred by a filter may be realized separately by well-formed affixes. For example, compare the Arabic forms in (57):

Now let us consider one more possible solution within Halle's 1992 theory. Suppose now that Q2 is in fact AGR and TENSE and that the prefix position is no more than a stem-augment like the prefix *ge-* in the German past participles such as *ge-fund-en* 'found'.

This solution also fails to capture the discontinuous bleeding effects. Consider the rules which would be necessary:

- (50) a. $\emptyset \rightarrow y / __ + \text{Stem}, Q2, 3\text{-pl-f}$
 b. $\emptyset \rightarrow y / __ + \text{Stem} + Q2, 3\text{-m}$
 c. $\emptyset \rightarrow n / __ + \text{Stem} + Q2, 1\text{-pl}$
 d. $\emptyset \rightarrow ? / __ + \text{Stem} + Q2, 1$
 e. $\emptyset \rightarrow t / __ + \text{Stem}$

- (51) a. $Q \rightarrow iina / \text{Stem} + __, 2\text{ f sg}$
 b. $Q \rightarrow u / \text{Stem} + __, 1\text{ pl}$
 c. $Q \rightarrow na / \text{Stem} + __, \text{ f pl}$
 d. $Q \rightarrow uuna / \text{Stem} + __, \text{ pl}$
 e. $Q \rightarrow aani / \text{Stem} + __, \text{ dual}$
 f. $Q \rightarrow u / __, \text{ Imperfect}$

We still need two rules prefixing *y-* to the stem (50a, b) and two rules spelling out *-u* as the INFL morpheme (51b, f). No advantage is gained by treating the prefixes as stem augments. The problem of discontinuous bleeding is still not solved.

1.8 QS WITH VARIABLE LABELS: PROPOSAL

In this section I introduce my own proposal, which modifies the Hallean view by complicating the mapping from the output of syntax to the input of morphology. In order to capture discontinuous bleeding effects as well as such violations of the Adjacency Constraint as occur in (47), I propose to make Q1 and Q2 independent of the location of AGR. As I illustrated in section 0.2.1.1, this entails the splitting of INFL into two locations of exponence.

I envision a mapping as in (52):

- (52) output of syntax: $[[[V] \text{ TENSE}] \text{ AGR}]$
 Linearization $[[[V] * \text{ TENSE}] * \text{ AGR}]$
 Merger: $[[V * [\text{ TENSE} + \text{ AGR}]]]$
 autonomous word-template: $[[Q1 * \text{ stem}] * Q2]$

The asterisks represent strict adjacency at the phonological level (Marantz 1988). In the mapping in (52), features in AGR and in Tense combine into a fused M^0 which I will call INFL. Then these features may be linked to either Q1 or Q2, as directed by each individual morphological rule.

Each morphological rule accomplishes the following: (1) it places a feature or features in a position of exponence (in autonomous word structure); (2) it discharges the feature(s); and (3) it fills the position of exponence (discharges the position) with a string.

In the Arabic case, INFL is required to split into two positions of exponence by the autonomous word structure selected by this INFL. In other words, a [-perfect] INFL is associated with an obligatory prefix and suffix position in the Arabic verb in Phase II of the mapping from Syntax to Phonology. This constitutes the well-formedness conditions on nonperfect verbs (excluding the imperative, which will be discussed in section 1.9).

Spell-out then becomes the choice of the best among available affixes to fulfill the selected template. Filling the template consists in discharging each Q as a string.

Each morphological rule individually places features in positions. For example, the *n-* prefix rule places the features '1 pl' in the prefix position and then discharges them as *n*, filling the Q. Hence each Q receives automatically the label it requires by each individual spell-out rule.

Each rule is associated with an affix which is either a prefix or a suffix as a phonological property. I take this property to be a feature associated with affixes, [\pm prefix]. The value for this feature I will call the *polarity* of an affix. The polarity of each affix in Arabic dictates which Q its features will be placed in.

In cases where a position is invariably associated with a particular sort of exponence, as in the fused case-number suffixes of Indo-European, then the word template selected by a stem will invariably label the position. For example, one need not learn that each individual case-number affix in Latvian (or other Indo-European) has suffixal polarity: this redundancy is encoded in autonomous morphological structure. In contrast, the polarity of affixes in Arabic must be learned, since INFL splits variously into prefixes and suffixes.⁴

Because morphological rules as I envision them discharge (fill) positions, they continue to give the position-class disjunctions as required. This is entirely analogous to Halle's Q-rewriting, since when a Q is rewritten as a string, the string occupies the position of the Q and two strings cannot occupy a position simultaneously.

More concretely, I will assume the following, ordered morphological rules:

(53)	→ a.	n-	1 pl	←			
		b.	ʔ	↓			
		c.	t-	2	←		
		d.	-aani	dual pl	←		
	→		-na	pl f	↓	←	
		→	-uuna	pl	↓	↓	
		g.	-iina	f(2)	←	↓	
	→		t-	f	↓	←	
		i.	y-	Elsewhere			
		j.	-u	Elsewhere			

either. The suffix position will then be filled by the default suffix *-u* and ill-formed 2 f sg **t-aktub-u* will result.

There is, however, a principled way to enforce the desired ordering. Observe that all the rules can be aligned according to the principle that person features have greater priority than number features which in turn have greater priority than gender features. This hierarchy is the very same one which in section 0.2.2.2 I argued conditions which feature is deleted when a filter is violated. This convergence of hierarchies is certainly not a necessary fact and therefore provides a surprising result. A considerable portion of the remainder of this work will be devoted to testing the hypothesis that the hierarchy which determines affix priority (morphological rule ordering) is in fact the same hierarchy which governs neutralizations.

Combining the hierarchy of features with the principle of Panini gives the following hypothesis regarding rule ordering:

(56) *Spell-Out Ordering Hypothesis*

If a given input can undergo two different spell-out rules the following principles order the rules in the unmarked instance, where one of two situations will obtain:

- (1) Panini's Principle: If one rule's structural description is contained in the other's, the rule with the more specific structural description applies first.
- (2) Feature Hierarchy: If the structural descriptions are disjoint or overlapping, then the rule referring to the hierarchically higher feature applies first.

All of the relationships which entail bleeding in (53) fall under condition (1) above, except (53d) before (53e), as I mentioned earlier. The earlier rule has the structural description 'pl dual' and the latter has 'pl f.' This ordering falls under condition (2). The structural descriptions are overlapping, but 'dual' is higher on the hierarchy than 'f' and so 'pl dual' applies first. If the rules apply in the wrong order, a 3 f pl dual form would come out **t-aktub-na* rather than

t-aktub-ani. The ordering of (53g) before (53h) also follows from condition (2) above, since '2' is higher than 'f' by the hierarchy.

Combining clause (2) of the Spell-Out Ordering Hypothesis with the conception of Impoverishment presented in section 0.2.2, we arrive at the following hypothesis:

(57) *The Feature Hierarchy Hypothesis*

There is a universal hierarchy of morphosyntactic features. If F and G are morphosyntactic features and F is higher than G on the hierarchy, then:

- (1) If $*[\alpha F \beta G]$ is active at Morphology, then $[\alpha F \beta G]$ is Impoverished to $[\alpha F]$.
- (2) If two spell-out rules, one referring to F, the other to G and not to F, have disjoint or overlapping structural descriptions, then the rule referring to F applies first.

This hypothesis is similar to observations made by Kurylowicz in his fifth law of analogy, summarized by Arlotto (1972:141) as:

(58) *Kurylowicz's Fifth Law of Analogy*

In order to reestablish a central grammatical distinction, a language will abandon one that is more marginal.

In the theory presented here, "central" translates to "expressed by means of higher features on the hierarchy." As an hypothesis about historical change, Kurylowicz's law, like the Feature Hierarchy Hypothesis, asserts in effect that hierarchically higher properties cannot be regularly neutralized by lower properties, nor will exponents of higher properties ever "lose" out to lower properties in the competition for expression.

In the next section I turn to the various allomorphs of tense/mood and explain how the present analysis can be extended to incorporate these.

1.9 EXPLAINING SUFFIX ALLOMORPHY

In this section the jussive and subjunctive moods will be brought under analysis. This leads naturally to a discussion of the relationship between prosodic structure and autonomous morphological structure.

All of the examples that follow are for forms within the inflectional class called the First Binyan. I will assume, following Aronoff (1994), that the Binyanim are inflectional class features supplied by derivational rules. These features then select the prosodic shape of the stem and affect its vocalism.

As discussed in section 1.1, the various suffix allomorphs are conditioned by the features of Tense/Mood. The descriptive generalizations are as in (59) and a chart of the relevant forms in the three tense/moods is given in (60):

- (59) a. Wherever the imperfect has *-u*, the subjunctive has *-a* and the jussive has no overt ending.
 b. Wherever the imperfect has a disyllabic suffix (*-uuna*, *-iina*, *-aani*), the subjunctive and jussive moods have only the first syllable of this suffix.
 c. Otherwise, there are no other alternations (*-na* is invariant).

(60)	<i>Imperfect</i>	<i>Subjunctive</i>	<i>Jussive</i>
	<i>-u</i>	<i>-a</i>	\emptyset
	<i>-uuna</i>	<i>-uu</i>	<i>-uu</i>
	<i>-iina</i>	<i>-ii</i>	<i>-ii</i>
	<i>-aani</i>	<i>-aa</i>	<i>-aa</i>
	<i>-na</i>	<i>-na</i>	<i>-na</i>

Because the Imperfect, Subjunctive, and Jussive all share a common prosodic stem shape (e.g. *aktub* < VCCVC or its equivalent in the prosodic terms of McCarthy & Prince 1990a), then these form a natural class in contradistinction to the perfect tense, which has the stem shape CVCVC, e.g. *katab-*.

I propose to express this difference through the feature [\pm perfect]. The Subjunctive and Jussive are the [-indicative]

subtypes of the [-perfect] category, as illustrated in the feature table in (61):

(61) *Tense/Mood Categories in Classical Arabic*

<i>Name</i>	[\pm perfect]	[\pm indic]	[subjunctive]	[jussive]
<i>Perfect</i>	+	+	u	u
<i>Imperfect</i>	-	+	u	u
<i>Subjunctive</i>	-	-	m	u
<i>Jussive</i>	-	-	u	m

In the table above, [\pm perfect] is treated as a bivalent feature, whereas [subjunctive] and [jussive] are treated as monovalent features or attributes of Tense/Mood. Owing to the different status of the two feature types, I use the coefficient [m] (for "mark") to indicate the presence of a monovalent feature, whereas [+] or [-] indicates the presence of a bivalent feature as well as its value. I postulate monovalent features wherever the absence of the feature (its negative value) appears to play no role.

Returning to the suffix allomorphs in (60) the most striking fact is that the bisyllabic suffixes *-aani*, *-iina* and *-uuna* appear truncated in the [-indicative] forms, that is, in the subjunctive and jussive. If we do not treat this relationship as one of truncation, but rather one of (suppletive) allomorphy, we are forced to assert (in effect) that it is a mere accident that the [-indicative] affixes are in all cases the first syllables of the [+indicative] affixes. I will not pursue this option.⁵

How then can we express this truncation, i.e. the generalization in (59b)? One way is to ensure that the suffix is maximally monosyllabic in the subjunctive and jussive. In order to express this observation, reconsider for a moment what the suffix is precisely.

Recall that in the Hallean model, each position is occupied by a Q, a dummy element which stands in for phonological material. What this phonological material is precisely is detailed by rules which spell-out Q. However, nothing in principle prevents us from stating rules which delimit the string which a given Q may appear as. In other words, it is perfectly plausible to state a rule as in (62):

(62) QSuffix \rightarrow [Qsuffix σ] / _____, [-perfect, -indicative]

The rule in (62) expresses the fact that the suffix position is maximally monosyllabic in the non-indicative moods (subjunctive and jussive). Note that rule (62) does not in fact rewrite QSuffix, in other words, it is *not* structure-changing; rather, it is a structure-building rule which provides the suffixal position with a particular prosodic template. Thus, the features [-perfect -indicative] are not discharged by rule (62) nor is the suffix position discharged (filled) by the rule.

This rule has the effect of a *morpheme-structure constraint*. No non-indicative verb suffix (of this conjugation) can have a shape larger than a single syllable. One way of understanding such rules is to think of them as redundancy rules operating over the suffixes in this conjugation. Insofar as the affixes realizing a particular position share a prosodic shape, this information can be encoded by means of this kind of redundancy rule.

This kind of prosodic morphology is entirely typical of the general shaping of roots in Arabic, as has been amply demonstrated (McCarthy 1979, McCarthy & Prince 1990a,b). We now extend this shaping to affixes as well. The truncation of suffixes in (59) is on a par with this strategy of prosodic shaping. In other words, the suffixes *-iuna*, *-iina*, and *-aani* are not in fact truncated in the subjunctive and jussive moods, but rather their second syllables cannot be prosodically licensed (in the sense of Itô 1986), owing to the imposition of the monosyllabic form for Q. Suffix by rule (62).

Introducing rules of form (62) is a considerable enrichment of the theory of morphological realization. In effect, what I am claiming is that not only may the content of an affix reflect its morphosyntactic features, but so also may the *form* of an affix. The most typical structure-building operations on morphological positions are of the prosodic type, i.e. manipulations of syllable structure. Truncations of the type seen in the Arabic suffixes are a subclass of prosodic operations, inasmuch as they establish a maximal prosodic quantity for the affix.

The idea that word positions, or more precisely the strings which come to occupy them, can be prosodically delimited, receives support from another observation from the very

beginning of this chapter, namely that all the prefixes of the imperfect conjugation are single segments. Recall that both the paradigm-model (including EWP) and the lexical affix-model have no way of expressing this fact. Why in fact should it be so? One obvious explanation is that the prosodic shape chosen by the [-perfect] verb stem is VCCVC, which lacks an onset.

Onsets are obligatory in all full (i.e. non-functional) words in Arabic. This still does not explain why, for example, there is no verb of the form *CVC-aktub-. Such a form would fulfill the onset requirement as well as have an extra prefixal syllable. Nor, really, does it explain why the onset is not simply a phonological default onset such as *w-* or *ʔ-*. In fact, the onset is *ʔ-* in the imperative *ʔ-uktub-Ø* (m sg), *ʔ-uktub-ii* (f sg), *ʔ-uktub-aa* (dual), *ʔ-uktub-uu* (m pl) and *ʔ-uktub-na* (f pl). The imperative INFL does not select an obligatory prefix position in autonomous word-structure, but the *phonology* of Arabic still requires an onset, and so default *ʔ-* appears in all the imperatives. This establishes that the morphological requirement of a prefix cannot be reducible to the phonological requirement of an onset: the latter can be met independently of the former.

In the non-imperatives, the onset is therefore an affix with a position in autonomous word structure, not just a phonologically required onset. To express this, I propose a rule which delimits the prefix to a single segment:

(63) QPrefix \rightarrow [QPrefix X]

This rule too takes the form of a redundancy rule operating over the affixes realizing the prefix position. One advantage to such a rule is that it allows certain similarities between prefixes and suffixes which appear in the perfect. For example, *n-* '1 pl' appears as a suffix, *-naa*, in the perfect tense. If the affix is really *naa* but is in effect "pre-truncated" by rule (63), then only one '1 pl' affix need be learned. Similarly, *t-* '2' appears as *-ta* in the perfect and *t-* feminine as *-at* in the perfect. Rule (63) ensures that these affixes have only one segment (consonantal, since it must be an onset) when appearing as prefixes.

The suffixal position is not specified for prosodic shape, so it can be left either undefined (i.e. autotemplatic) or its shape can be dynamically delimited by a rule such as (62).

Now let us consider the relationship which autonomous word-templates as in (64) below have with prosodic templates. We know, for example, that the Arabic [-perfect] stem has the form VCCVC (or its moraic equivalent; I use CV-skeleta for simplicity here). We also know that the imperfect verb has a specific morphological template, and that the prefix position is limited to a single segment. The relation between these is shown in (64):

- (64) prosodic template C VCCVC
 | |
 [[QPrefix * Verb] * QSuffix]

A way to generate the structure in (64) is to say that a [-perfect] V+INFL stem selects a particular prosodic template (two heavy syllables with no onset) and a word-template (a prefix and a suffix position: QPrefix and QSuffix).

The particular prosodic shape chosen (two heavy syllables without onset) is a *stem formative* of the verb radical. The fact that the stem formative happens to be a prosodic shape rather than an affix, as in the themes of Latvian or Huave or the word markers of Spanish, is, while not particularly obvious, not surprising, once autosegmental phonology is permitted. This was essentially McCarthy's original observation.

Just as each noun in Latvian nouns requires a Theme, each Arabic verb requires a prosodic shape, and this requirement is clearly a language-specific matter of autonomous word structure.⁶ Furthermore, the vocalism of the verb is also a stem formative. In some cases, the vocalism is predictable, in others, selected by the radical. For example, the first vowel of the [-perfect] forms is *a* but the second may be any of the three vowels *a i u*: *y-aktub-u* 'he writes,' but *ya-ʕlam-u* 'he knows, learns,' and *y-anzil-u* 'he descends.'

These requirements can be diagrammed as below:

- (65) Q, Vocalism
 |
 Q, Prosody
 |
 Verb Radical

The apparent peculiarity of such nonconcatenative morphology derives from the superimposition of the stem formatives by Tier Conflation (McCarthy 1979). But otherwise, the Arabic system is not any different from the Latvian one: while the Prosody and the Vocalism of a verb may show allomorphy depending on tense/mood, tense/mood may be realized directly in the suffix position.

Given the truncation effect that rule (62) simulates, the only allomorphy among the suffixes in (61) remaining to be explained is that of the elsewhere cases *-u*, *-a* and $-\emptyset$. To this end, I replace the one Elsewhere rule of the last section with the three rules in (66):

- (66) a. -perfect +indicative *-u*
 b. jussive $-\emptyset$
 c. Elsewhere *-a*

The subjunctive ending *-a* is treated here as the elsewhere case on analogy to the unmarked 3 m sg suffix *-a* in the perfect *katab-a* 'he wrote.'

Now I review more explicitly the derivation of a [-perfect] verb. Let us take as an example *t-aktub-ii* 'you (f, sg) write (subjunctive).' Assume that after Rebracketing, the output of syntax is:

- (67) [[*Vktb*] [INFL 2, f, -perfect, -indicative]]

Because Arabic verbs must conform to the autonomous word structure in (65), the features in (67) will be mapped onto this structure. Moreover, as a property of autonomous word structure, nonperfect verbs in Arabic also select the morphological structure:

- (68) QPrefix * Verb * QSuffix

1.10 HIERARCHY AMONG THE AGR AND T SUFFIXES

Consider now the full set of feature-discharging rules for the [-perfect] inflectional affixes:

(75)	a.	<i>n-</i>	1 pl						
	b.	<i>ʔ-</i>	1						
	c.	<i>t-</i>	2						
	d.	<i>aani</i>	dual pl	← ←					
	e.	<i>-na</i>	pl f			← ←			
	f.	<i>-uuna</i>	pl				← ←		
	g.	<i>-ina</i>	f (2)					← ←	
	h.	<i>t-</i>	f						
	i.	<i>-u</i>	-perf +indic	←		←		←	
	j.	<i>∅</i>	jussive		←	←	←	←	←
	k.	<i>y-</i>	Elsewhere						
	L.	<i>-a</i>	Elsewhere						

Several new crucial orderings are required and are noted in the above array. These orderings express the fact that the tense/mood suffixes *-u* and *∅* appear only if the suffix position is not filled by an affix discharging AGR features. For example, the 3rd person masculine plural form in the jussive is not **y-aktub-∅* but rather *y-aktub-uu*. Therefore, the rule identifying the suffix with the feature pl (75f) must apply before the jussive rule (75j).

In all these orderings, tense/mood features are the very lowest in terms of priority. This does not follow from the hierarchy which motivates neutralization, nor from any syntactic principles. Since T is closer to the verb than AGR at the output of syntax before merger, then if the pre-merger structure is used to motivate rule ordering, we should expect T features to be visible first. On the other hand, because merger does apply, T and AGR become a single fused M^0 , and therefore T is not then closer to V.

One possibility is that in fact T has fused with the verb rather than with AGR. In this analysis, the tense features become like inherent properties of the verb stem, and therefore are able to condition allomorphy of any peripheral affixes.

This view allows the suffixes *-u*, *-a* and *∅* to be various allomorphs of the Elsewhere affix, as conditioned by the tense features on the verb.⁸

(76)	a.	<i>-u</i>	Elsewhere (-perfect +indicative)
	b.	<i>∅</i>	Elsewhere (jussive)
	c.	<i>-a</i>	Elsewhere

It should be carefully noted that such multiple elsewhere allomorphs (like all allomorphy alternations) can be conditioned only by inherent features of the stem or by previously discharged features. It is predicted, then, that any sort of allomorphy can be sensitive only to inherent properties of the stem or to properties realized more closely to the stem. Thus, we derive the effects of Carstairs' (1987:193) Peripherality Constraint:

(77) Peripherality Constraint

The realization of a property . . . may be sensitive inwards, i.e. to a property realised more centrally in the word-form (that is, closer in linear sequence to the root), but not outwards to an individual property realized more peripherally (further from the root).

Whether T merges with the verb or with AGR in classical Arabic is unresolved here, pending a more extensive investigation of the stem allomorphy of the various verb tenses.

1.11 ZERO AFFIXES

One of the most persistent debates in the study of morphology centers on the question of \emptyset -morphs (Matthews 1974 has good discussion). Among recent work, opinions range from staunch support, as in Pesetsky's (1995) Zero-Syntax, to dismissal of zero-morphs entirely (Zwicky & Pullum 1992).

Since the advent of the theory of empty categories, opinion has converged on the idea that null elements play a role in

syntax. That a particular X^0 is phonologically empty is not particularly controversial.

Insofar as affixes and X^0 s are isomorphic, it would appear that the existence of null X^0 s demands the existence of null affixes as well. Yet I have shown that affixes are not isomorphic to X^0 s, so this argument no longer holds quite as directly. We must establish an explicit definition of zero-morphs at the *morphological* level.

In this book, zero-morphs have a particular interpretation as follows. Observe that the Arabic jussive suffix is $-\emptyset$. What is the real content of asserting that the suffix is nothing, a null?

For Halle (1992), a zero-suffix results when a Q is rewritten as \emptyset . Because Qs are not well-formed entities at Phonological Form, every Q must be replaced, and in cases where a postulated position has no string associated with it for a given word, Halle's theory demands a rule replacing Q by \emptyset .

In the theory presented here, I have defined Qs as obligatory positions of exponence which may figure in autonomous word structure. Insofar as these positions are obligatory, no prefix-conjugation verb in Arabic will be well-formed without a suffix. Since the suffix $-\emptyset$ is associated with a particular property, namely the jussive mood, which has no other principal exponent, we are justified in postulating a *contentful* \emptyset -affix.

The identity of the jussive forms lies precisely in the fact that they are suffix-less. This is encoded by the special rule (75) conditioned by the feature [jussive]. Since jussive is a morphosyntactically marked category, the system shows *iconicity* if a more marked category morphosyntactically is more marked morphologically. Yet a zero-suffix would appear, *prima facie*, to be precisely the opposite: maximally unmarked. On the contrary, in the system as analyzed here, the zero-suffix is in fact marked *with respect to the system as a whole*. Hence there is an iconic relationship as expected. If we abandon the idea that zero-suffixes exist (or, equivalently, that there is an obligatory position which is filled by special rule), then the iconicity of the system is lost.

Not all zeroes have content, however. I will be arguing in chapter 3 that a contentful \emptyset may occur only where a position is obligatory in autonomous morphological structure. In Berber

(section 1.18) and many languages with multiple argument agreement, affixes need not be licensed by positions-of-exponence in autonomous morphological structure. In such languages, since no position is obligatory, there can be no contentful zero-affixes. Contentful zero-affixes like the Arabic $-\emptyset$ (and also like the enclitic $-\emptyset$ in Mam, to be discussed in section 2.1.6), however, discharge features and fill obligatory positions.

1.12 HISTORICAL REANALYSIS AND DISCONTINUOUS BLEEDING

The imperfect conjugation in Arabic is one representative of what is known as the prefix conjugation within the Afroasiatic superfamily of languages. Because of its extreme antiquity, the prefix-conjugation can be traced with relative ease from its earliest attestations in Old Akkadian c. 2500 B.C.E. to many of the modern languages of the Near East and northern Africa. The historical changes which develop within this conjugational pattern form the focus of the next several sections, and provide a useful arena in which to test any analysis. I will be arguing that these historical changes can be analyzed most simply in the theoretical framework advanced in the previous sections for the Arabic prefix conjugation. In particular, I will argue that certain languages gained or acquired filters (i.e. cooccurrence restrictions for morphological features), lost certain affixes, or reanalyzed the content of affixes. I endeavor to show that the systemic adjustments that accompanied these changes follow automatically, and certain "curious" problems of historical Afroasiatic morphology receive new and natural explanation.

1.13 THE FATE OF -UUNA AND GENDER IN THE PLURAL

Recall from section 1.5 that the affix-based model and the word-paradigm model are both capable of generating the correct forms in the Arabic prefix conjugation. The arguments I have presented in favor of a new analysis of the facts do not hinge on descriptive adequacy. But to express the facts, both the affix- and paradigm-based analyses have to incorporate special rules or complicate the feature content of particular affixes. In this section, I consider the first case of discontinuous bleeding, that of *-uuna* 'pl' by *n*- '1 pl.' Historical developments which I now detail can be expressed easily and simply if *-uuna* is 'plural' alone and not further specified by either (1) a feature [-1], which might exclude its appearance in the 1 pl, or (2) 'masculine,' which, by appeal to the lack of gender in the 1st person, might likewise exclude it from 1 pl. These developments support my contention that *-uuna* is plural alone and that discontinuous bleeding should not be captured by extra features but by the workings of the theory itself.

1.13.1 Gender in the Plural

A number of modern Arabic dialects have lost gender distinctions in plural, for example, Egyptian Arabic (Aboul-Fetouh 1969), the dialects of Bahrain (Al-Tajir 1982) and Abu Dhabi (Qafisheh 1977), as well as all the dialects of the Maghreb, including Libya, Tunisia, Algeria, and Morocco (Marçais 1977). A simple development from the classical pattern may be seen in Egyptian Arabic:

(78) The Egyptian Arabic Prefix Conjugation (Imperfect)

<i>yi-ktib</i>	3 m sg
<i>ti-ktib</i>	3 f sg
<i>ti-ktib</i>	2 m sg
<i>ti-ktib-i</i>	2 f sg
? <i>a-ktib</i>	1 sg
<i>yi-ktib-u</i>	3 pl
<i>ti-ktib-u</i>	2 pl
<i>ni-ktib</i>	1 pl

Among the changes observed in this dialect are the change of *-uuna* > *-u*, *-iina* > *-i*, and *-u* > Ø, and the ablaut of the initial *a* to *i* in all but the 1st person singular.⁹

To express the Impoverishment of gender in the plural, I propose that those dialects of Arabic which lost gender in the plural acquired the filter *[pl f]. Following the Feature Hierarchy Hypothesis, the gender feature *f*, being hierarchically subordinate to the number feature *pl*, was lost. We can express this graphically by a delinking rule:

(79) pl
 \uparrow
 f

The application of (79) makes all plurals be unspecified for gender (recall that *f* is privative here, and so masculine is unmarked).

The filter in (79) must be stipulated to apply only to verbs and pronouns. Nouns retain their inherent gender (*m* or *f*) and adjectives continue to inflect for gender and number, but verbs and pronouns cease to show any gender distinction in the plural. For example, in (80) are tabulated the 3rd person pronouns of Classical and Egyptian Arabic (the latter from Aboul-Fetouh 1969:85):

(80)	Classical	Egyptian
	3 m sg	huuwa
	3 f sg	hiyya
	3 m pl	hum
	3 f pl	humma

Observe that there is now no way to treat the Egyptian Arabic plural suffix *-u* as masculine plural, since the feminine plurals in fact also take this suffix in Egyptian. Recall that this was one possible maneuver out of the problem posed by the discontinuous bleeding of *-uuna* 'pl' by *n- '1 pl.'* both for paradigm models and affix-based models.

In the modern Arabic dialects which have lost gender in the plural there seems no way of avoiding treating *-u* < *-uuna* as simply the suffix for plural *alone*. We cannot block affixing it to a 1 pl form on the basis of a gender feature. Recall that EWP requires a special rule of some sort to prevent this from happening. For classical Arabic, I showed that EWP might have recourse to a disjunction of the type:

- (81) a. /X/ 1 pl → /X+u/
 b. /X/ pl → /X+uuna/
 c. Elsewhere, /X/ → /X+u/

For Modern Egyptian, the same set of rules would have to be:

- (82) a. /X/ 1 pl → /X/
 b. /X/ pl → /X+u/

What is noteworthy about (82) is that, in order to prevent the 1 pl form from being suffixed by rule (82b), there must be a previous rule disjunctive with this rule, and this previous rule must do nothing, i.e. rewrite a string as itself. Alternative strategies, such as permitting certain disjunctions across rule blocks, lead to ordering paradoxes, as I showed earlier.

Such identity rules are necessary only in a theory which in principle cannot express the discontinuous bleeding of *-u* 'pl' by *n- '1 pl.'* In a theory in which discontinuous bleeding can be directly expressed, identity rules are rendered superfluous.

It is certainly not the case that the discontinuous bleeding of the plural suffix by 1 pl prefix is an historical accident. This can be verified directly by examining the identical pattern in another Afroasiatic language of the Northern Cushitic branch, Beja (also known as Hadareb, Bedauye, Bedawie, Bedawye, etc.), spoken in Sudan and Northern Ethiopia. The following paradigm is from Zaborski (1974:12) citing Hudson (1974:133):

(83) *Prefix Conjugation in Beja* 1 w 'to burn'

ʔi-līw	3 m sg	'(s)he burned' etc.
ti-līw	3 f sg	
ti-līw-à	2 m sg	
ti-līw-ì	2 f sg	
a-līw	1 sg	
ʔi-līw-nà	3 pl	
ti-līw-nà	2 pl	
nī-līw	1 pl	

The remarkable similarity between the Cushitic prefix-conjugation, as in Beja, and the Semitic pattern, as in Arabic, was a decisive factor in postulating the Afroasiatic family of languages as early as Meinhof's study (1912:138).¹⁰ A similar pattern of verbal prefixes appears in the East Cushitic languages Ṡafar and Saho, spoken in Eastern Ethiopia and Djibouti. Three paradigms of Saho are presented below, from Zaborski (1974:22ff) citing Rossi (1913:164):

(84) *Saho Prefix Conjugation* g d f 'to kill'

	present	past
3 m	y-agdif-é	y-igdif-é
3 f	t-agdif-é	t-igdif-é
2	t-agdif-é	t-igdif-é
1	agdif-e'	igdif-é
3 pl	y-agdif-in	y-igdif-in
2 pl	t-agdif-in	t-igdif-in
1 pl	n-agdif-é	n-igdif-é

Here we see the same type of system as in classical Arabic: the default mood suffix *-é* appears when *-in* 'pl' does not already fill the position.¹¹ Again, there is the same discontinuous bleeding of the plural suffix by the '1 pl' prefix.

On the basis of the evidence from the more archaic representatives of the prefix conjugation in Cushitic, we can safely assume that the discontinuous bleeding relationship between the pl suffix and the 1 pl prefix is a remarkably stable systematic property of Afroasiatic as a whole, antedating the division of Semitic from Afroasiatic: it is both highly archaic and highly resistant to change. It is neither the result of accidental homophonies nor of separate identity rules. Even more compelling evidence for discontinuous bleeding comes from the reflex of the prefix-conjugation in Berber, but this will be discussed in section 1.18.

1.13.2 The Plural Suffix as Specifically non-1st Person

Another possible solution to the discontinuous bleeding problem is to treat *-u* as a specifically [-1 pl] suffix, which requires introducing [-1] as a potential value into morphological representations (a less constrained theory of features).

Suppose, for the moment then, that *-u* is in fact treated as [-1 pl], in other words, a plural suffix specifically unable to appear in 1st person forms. If this move is made, we have no natural way to explain another historical development which I now detail.

In the Maghrebi dialects of modern Arabic generally, the 1st person singular *ʔ-* is replaced by the reflex of classical *n-*, that is to say that, the 1 pl prefix becomes the generalized 1st person prefix, as shown in the following paradigm from the dialect of Arabic spoken by Tunisian Jews (Cohen 1975:94):

(85) The Tunisian Jewish Arabic Imperfect

<i>y-éktəb</i>	3 msg
<i>t-éktəb</i>	3 f sg
<i>t-éktəb</i>	2 sg
<i>n-éktəb</i>	1 sg
<i>y-éktb-u</i>	3 pl
<i>t-éktb-u</i>	2 pl
<i>n-éktb-u</i>	1 pl

As Cohen writes (1975:96):

Without a doubt, the weakening of *hamza* [glottal stop] must have played a role in the extension of *n-* to the 1st person singular from the 1st person plural. This extension, and the generalization to the plural of the desinence *-u* of the 2nd and 3rd persons are connected facts for which it is not possible to determine the order of chronological succession nor orient the causal relationship [trans. mine].

Given the hypothesis that *-u* represents plural alone here, we can in fact make a prediction about the chronological succession. When *ʔ-* was lost and *n-* was reanalyzed as '1 pl,' then discontinuous bleeding was no longer motivated, and the plural suffix *-u* was applied to all the plural forms.¹² We have no need to countenance a change in the suffix itself, since, as the elsewhere suffix for plurals, it naturally stepped in when not constrained from doing so by discontinuous bleeding of pl to the prefix position by *n-* as 1 pl. This change is shown below:

(86) Classical Pre-Maghrebi Maghrebi Arabic (cf. Egyptian)

1 pl <i>n-</i>	1 pl <i>n-</i>	>	1 <i>n-</i>
1 <i>ʔ-</i>	1 <i>ʔ-</i>	>	Ø
pl <i>-uuna</i>	pl <i>-u</i>	>	pl <i>-u</i>

If, on the other hand, *-uuna* > *-u* is a specifically [-1] suffix, its extension to the 1 pl form is not automatic at all; in fact, it should be inhibited. In order for *-u* to be extended, it must lose its [-1] feature. There must be two reanalyses: *n-1 pl* > 1, and *-u* [-1 pl] > pl. Positing two reanalyses cannot then explain the causal relationship between the loss of ? and the extension of *-u*. For the [-1] feature of *-uuna* > *-u* could have simply been lost independently. Yet this never occurs, not in *any* attested reflex of the Afroasiatic prefix conjugation. Only when *n-* is reanalyzed as '1' in the Maghreb dialects does *-u* extend to 1 pl. On the other hand, the extension of *-u* to all the persons in the Maghreb dialects follows naturally in the model in which *-u* is plural alone, and its failure to appear in the 1 pl is captured by discontinuous bleeding and not a special feature [-1].

To summarize, historical facts strongly suggest that discontinuous bleeding as I have analyzed it is a linguistic reality, both quite archaic and quite stable. The loss of gender in the plural in a number of the modern Arabic dialects, along with the extension of plural *-u* to the 1st person only where there was concomitant loss of *n-* suggest strongly that this case of discontinuous bleeding is no accident, and any correct morphological theory must be able to express it.

1.14 LOSS OF A FILTER: 1ST PERSON DUALS

I showed in section 1.11.1 that Egyptian Arabic gained the filter *[pl f] for verbs and pronouns, and that, in accordance with the Feature Hierarchy Hypothesis, the feature 'f' was deleted in all such combinations at Morphology. Other things being equal, we should also expect to find a historical change in which a filter is *lost*. In this section I show that precisely this did happen in the development of 1st person dual forms.

Recall that Classical Arabic has the filter *[1 dual]. The dual number is never distinguished for the 1st person, although such forms as **ʔ-aktub-aani* '1-write-dual' could be generated by an input '1 pl' AGR. To evade this, I have argued that a filter *[1 dual] is automatically assumed by the child learning the grammar until he or she finds positive evidence to switch

the filter off. The filter impoverishes a '1 dual' AGR, neutralizing it with a '1 pl' AGR.

Recall from 0.2.2.4 that duals are unusual in that they may be optionally enhanced by an otiose 'pl' (i.e. [-sg]) specification, or this enhancing 'pl' may be absent morphologically. If a 1st person dual category were to arise, we should expect two options: either it is enhanced by 'pl' — formed by analogy to 1 pl — or it is not enhanced, i.e. analogized from the 1 sg form.

Both options are represented in Semitic, the former by Ugaritic and the latter by the South Arabian languages Mehri and Soqotri.

The South Arabian languages Mehri and šawri are spoken by small populations in the southern region of the Arabian peninsula (Yemen and Oman), while Soqotri is spoken on the island of Soqatra, south of the Arabian peninsula (part of Yemen). The prefix conjugation for Mehri (Johnstone 1987) is shown below:

(87) The Mehri Imperfect. r k z 'to straighten'

	sg	dual	plural
3 m	yə-rūkəz	yə-rəkz-ō	yə-rəkz-əm
3 f	tə-rūkəz	tə-rəkz-ō	tə-rəkz-ən ¹³
2 m	tə-rūkəz	tə-rəkz-ō	tə-rəkz-əm
2 f	tə-rəkəz(-i) ¹⁴	tə-rəkz-ō	tə-rəkz-ən
1	ə-rūkəz	ə-rəkz-ō	nə-rūkəz

Observe that the 1st person dual form *ə-rəkz-ō* has the prefix *ə-*'1' and the suffix *-ō* 'dual,' and is thus analogous to the ill-formed **ʔ-aktub-aani* '1-write-dual' of Classical Arabic. My analysis is committed to the idea that only the filter prevents this form from being produced in Classical Arabic, which I take to be approximately the Proto-Semitic system, following standard assumptions in Brockelmann (1961) or Moscati (1964). When the Proto-Semitic *[1 dual] filter is switched off, as in Mehri, then the expected analogous forms appear automatically.¹⁵

A similar pattern may be seen in Soqofri (Bittner 1918:73).¹⁶ The dual forms cognate with the Mehri forms are shown below:

- (88) *The Soqofri prefix-conjugation dual. k t b 'write'*
- | | |
|----|-------------------|
| 3m | <i>i-kéteb-o</i> |
| 3f | <i>te-kéteb-o</i> |
| 2m | <i>te-kéteb-o</i> |
| 2f | <i>te-kéteb-o</i> |
| 1 | <i>e-kéteb-o</i> |

It should be apparent that any theory which does not incorporate filters will have trouble expressing this change naturally. For example, if the dual suffix is subcategorized to appear only in [-I] categories in Arabic, then one could appeal to loss of this subcategorization in Mehri, for example. But this would make the reanalysis a property of the individual affix and not of the system as a whole. This is clearly incorrect, since Mehri has also innovated a 1 dual category in the suffix (perfect) conjugation:

- (89) *The Mehri Suffix Conjugation. r k z 'to straighten'*
- | | | | |
|----|-----------------|------------------|-------------------|
| | sg | dual | plural |
| 3m | <i>rəkūz</i> | <i>rəkəz-o</i> | <i>rəkáwz</i> |
| 3f | <i>rəkəz-ūt</i> | <i>rəkəz-t-ō</i> | <i>rəkūz</i> |
| 2m | <i>rəkəz-k</i> | <i>rəkəz-k-i</i> | <i>rəkəz-kəm</i> |
| 2f | <i>rəkəz-š</i> | <i>rəkəz-k-i</i> | <i>rəkəz-k-ən</i> |
| 1 | <i>rəkəz-k</i> | <i>rəkəz-k-i</i> | <i>rəkūz-ən</i> |

There are several points of interest about the above paradigm.

The first is that 1st person dual *rəkəz-k-i* is formed from the 1 sg form *rəkəz-k* and not from the 1 pl form *rəkūz-ən*. Thus, dual is not enhanced by the plural in this conjugation either. The 1 dual forms in both conjugations are formed synthetically, that is to say, solely from affixes which are pre-existent in the system. In the prefixing conjugation the two affixes are ə- '1' and -ō 'dual', in the suffixing conjugation -k '1' and -i 'dual'. In

order to prevent analogous forms in Classical Arabic, we must appeal to a filter: when the filter is switched off, as in Mehri, these forms are automatically generated. This provides the evidence that historical change may consist only in the loss of a filter, with new forms automatically being built up with the available affixes.

The dual suffix is -i in the 1st and 2nd persons but -ō in the 3rd person. It appears that -i is cognate with the Arabic nominal dual ending in the oblique case -ay, whereas -ō is cognate with dual -aa(ni), which is the verbal dual ending as well as direct case nominal dual.¹⁷

Given that there exists a dual suffix -i and the fact that duals appear to be formed off of singulars in this instance, we should expect a 2 f du form **rəkəz-š-i* with the 2 f suffix -š. In fact, the 2 f dual form is homophonous with the 2 m dual form: both are *rəkəz-k-i*, formed from the 2 m sg form *rəkəz-k*.

This result is predicted by my analysis since 2 f dual is impoverished by the filter *[2 f dual], as in Classical Arabic. When in a [2 f dual] AGR the 'f' is deleted (as a result of the filter and the hierarchy, as discussed earlier), the result is [2 dual], i.e. the unmarked masculine form:

- (90) Input 2 f dual
 Filter *[2 f dual]
 Impoverishment 2 dual
 Rules 2 -k
 dual (1,2) -i

The form *rəkəz-k-i* provides evidence that Impoverishment actually applies to the input [2 f dual], preventing the bad form **rəkəz-š-i* which could be generated from the fully specified input.¹⁸

The only other 1 dual forms in Semitic appear in a few examples from Ugaritic, a North-West Semitic language preserved only in unvowelled texts from c. 1300-1100 B.C.E. Gordon (1947a:59, §9.4) gives the following examples:

- (91) a. *ql-ny* 'we (dual) have prostrated ourselves'
 b. *[m] ḡ-ny* 'we (dual) came'

The 1 dual suffix is attested as unvowelled *-ny*, which is reconstructed as **-na-yā*. The same suffix appears also as a pronominal clitic in the possessive construction (92a) and with a preposition (92b):

- (92) a. *adt-ny* 'our (dual) lady'
 b. *ʕm-ny* 'with us (dual)' (Gordon 1947a:28 §6.21)

The 1 dual suffix appears to be formed from the 1 pl *-na* plus dual suffix *-(y)ā*. It is thus a case in which a dual form is enhanced by the specification 'pl.'

Whether Proto-Semitic had 1 dual forms or not is unclear. Some scholars take the 1 dual forms in Ugaritic as suggestive of an archaic 1 dual which was lost in all branches of Semitic other than Ugaritic (later, perhaps, to resurface in South Arabian). In support of this notion, the cognate 1 dual suffix *-ny* of Ancient Egyptian is generally cited.¹⁹ Within the present framework, one cannot know whether Ancient Egyptian and Ugaritic both independently lost the *[1 dual] filter and automatically innovated these forms or whether Semitic (other than Ugaritic) gained the filter after Semitic separated from Ancient Egyptian. Obviously, the existence of 1 dual forms in both Ugaritic and Ancient Egyptian does not in itself prove the archaism of these forms, since all that need happen for these forms to appear is for the filter to be lost.

To summarize, the loss of gender in the plural in Egyptian Arabic shows the case of gaining a morphological filter through historical change. The analogical extension of the dual suffix to the 1st person in Mehri and Soqotri shows the opposite: historical change consisting merely in the loss of a filter. Other 1 dual forms, enhanced by 'pl' and formed from the 1 pl form with added dual suffix, appear in Ugaritic. It is unclear whether these forms are derived from Proto-Semitic or not: in any case, either Ugaritic lost the filter *[1 dual] or the rest of Semitic gained it. The point, however, is that all these historical changes, traditionally explained as analogy, can be reinterpreted here merely as loss or gain of filters. Analogical forms are then generated automatically by the pre-existent rules of each system, while forms which are lost cannot be

generated since the inputs required to generate them have been simplified by Impoverishment.

1.15 THE Y- AND T- PREFIXES AS DEFAULTS

It is usually assumed that the distribution of *y-* and *t-* in the prefix conjugation of classical Arabic is the same as that of Proto-Semitic (Brockelmann 1961 §6.20), although Akkadian presents a complication to be discussed shortly. Recall that *t-* appears in all 2nd person forms, and 3rd person feminine *except* 3 f pl, as can be seen in the Arabic 2nd and 3rd person forms retabulated below:

(93)	singular	dual	plural	
	<i>y-aktub-u</i>	<i>y-aktub-aani</i>	<i>y-aktub-uuna</i>	3 m
	<i>t-aktub-u</i>	<i>t-aktub-aani</i>	<i>y-aktub-na</i>	3 f
	<i>t-aktub-u</i>	<i>t-aktub-aani</i>	<i>t-aktub-uuna</i>	2 m
	<i>t-aktub-iina</i>	<i>id.</i>	<i>t-aktub-na</i>	2 f

The analysis presented in section 1.8 takes the *y-* as the default prefix and posits two homophonous *t-* prefixes: '2' and 'f'. The reason that *t-* does not appear in the 3 f pl is because 'f' is linked to the suffix position by the affix *-na* 'f pl' before the *t-* 'f' rule applies (cf. 53). The relevant rules are given below:

- (94) a. *t-* 2
 b. *-na* f pl
 c. *t-* f
 d. *y-* Elsewhere

There are two important facts to note about the above array. First, there are two homophonous *t-* prefixes. Second, *y-* is the elsewhere prefix. The reason for supposing that *y-* is the elsewhere prefix is that its distribution is not quite a natural class of categories. To state the distribution of *y-* positively, a rule must refer to 3 m *or* 3 pl. By treating *y-* as the elsewhere case, one can instead capture this disjunctive environment as a consequence of discontinuous bleeding: *t-* cannot appear in the 3

f pl because 'f' is discharged by rule (94b) by the time (94c) applies to an input AGR with f pl.

This much I have already discussed. However, observe that while the rules in (94) capture the discontinuous bleeding effect and also avoid the '3 m or 3 pl' disjunction, there is still the peculiarity of having two identical *t*-rules. Not only are there two homophonous *t*-affixes, but the rules introducing these affixes must apply at different times in the derivation, as crucially ordered above.

Because of this homophony, we might expect a reanalysis to take place whereby the *t*-prefix becomes the default case. In this section, I argue that precisely this occurs in Hebrew, Ugaritic, Tell Amarna Canaanite, and South Arabian. All other branches of Semitic (as well as a number of Cushitic languages) treat *y*- or its reflex as the elsewhere case and retain two homophonous *t*-prefixes.

In this regard, consider the Hebrew paradigm in (95) (Lambdin 1971:99):

(95) *Hebrew Prefix Conjugation. k t b* 'write'

	singular	plural
3 m	<i>yī-xtōv</i>	<i>yī-xtāv-û</i>
3 f	<i>tī-xtōv</i>	<i>tī-xtāv-nā</i>
2 m	<i>tī-xtōv</i>	<i>tī-xtāv-û</i>
2 f	<i>tī-xtāv-î</i>	<i>tī-xtāv-nā</i>
1	<i>?e-xtōv</i>	<i>nī-xtōv</i>

These forms are much the same as the Classical Arabic forms with one significant exception: the 3 f pl form has the *t*-prefix. To Heb. *tī-xtāv-na* compare Ar. *y-aktub-na*.

A similar pattern can be seen in South Arabian. The forms in Mehri can be seen in section 1.14. The 3 f pl form is *tə-rəḳz-ən* 'they (f) straighten', again with the *t*-prefix. The *t*-prefix occurs in the 3 f pl in Soqotri as well (Bittner 1918) and also in Šawri, as can be seen in the paradigm below from Thomas (1937:28):

(96) *Šawri Prefix Conjugation. ayād* 'to walk'

	singular	plural
3 m	<i>i-yad</i>	<i>i-yad</i>
3 f	<i>ta-yad</i>	<i>ta-yad-an</i>
2 m	<i>t-yad</i>	<i>t-yod</i>
2 f	<i>ta-y-it</i>	<i>ta-yd-an</i>
1	<i>l-yad</i>	<i>na-yod</i>

In Šawri, the 3 f pl form has prefix *ta-* and is homophonous with the 2 f pl form as in Hebrew.²⁰

Among the S. Semitic languages, only S. Arabian show the extension of *t-* to the 3 f pl, whereas the Ethiopic S. Semitic languages retain the archaic pattern of Arabic.

A simple example is Tigre, where, in an independent development, **y-* has *ə-* as reflex and the dual has been lost (data from Raz 1983)²¹:

(97) *Tigre Prefix Conjugation. q n s* 'to get up'

	singular	plural
3 m	<i>ə-qannəs</i>	<i>ə-qanṣ-o</i>
3 f	<i>tə-qannəs</i>	<i>ə-qanṣ-a</i>
2 m	<i>tə-qannəs</i>	<i>ə-qanṣ-o</i>
2 f	<i>tə-qanṣ-i</i>	<i>tə-qanṣ-a</i>
1	<i>?ə-qannəs</i>	<i>?ən-qannəs</i>

The 3 f pl form *ə-qanṣ-a* 'they (f) get up' does not have the *t-* prefix as in S. Arabian. The Classical Arabic pattern is also duplicated in Classical Ethiopic (Gefez) (Lambdin 1978), and the modern Saudi dialects which retain gender in the plural (Prochazka 1988). A similar pattern, although with some other developments, is seen in Syriac (Kaye 1976:147), Chaha (Ethiopic, Ford, 1991:271), and a more conservative dialect of Chadian Arabic, described by Zeltner & Tournoux (1986:73).

We are thus able to identify two separate geographic areas, S. Arabian and Hebrew, where the 3 f pl form has *t-*, while the rest of Semitic has *y-*.

Consider now the analysis of these special forms. For example, what is the content of the affixes in the Hebrew 3 f pl form *tī-xtōv-nā*? Suppose that *tī-* is 'f.' The problem is then how to describe the distribution of the suffix *-nā*. Suppose it is the allomorph of 'pl' appearing in the feminine. The two rules below will derive *tī-xtōv-nā*:

- (98) *tī-* f
-nā pl (f)

This analysis is undesirable for two reasons. First, and most obviously, it does not work for the 2nd person forms. Consider the 2 f pl form *tī-xtōv-nā*, which is homophonous with the 3 f pl form. Here, by analogy to Arabic, one might suppose that there are two *tī-* prefixes, one meaning '2,' the other, 'f.' The rules needed to derive the 2 f pl form are:

- (99) *tī-* 2
-nā f pl

For the 2nd person form, the suffix *-nā* must be a primary exponent of 'f,' whereas for the 3rd person form, it is merely a secondary exponent, i.e. an allomorph of plural appearing when 'f' has been previously discharged. This wrongly implies that there are in fact two homophonous *-nā* suffixes.

Secondly, observe that in (98) the rules will have to be ordered such that 'f' is realized as *tī-* before the 'pl' suffix is realized. This violates the hierarchy I proposed earlier, whereby gender features are lower than number features and therefore are realized by later rules (other things being equal).

To evade all of these complications, I propose that in Hebrew and in S. Arabian, a reanalysis took place and *t-* became the default prefix of the prefix conjugation. Because there can be at most one elsewhere realization for any given position of exponence, an automatic consequence of the reanalysis is that the former elsewhere prefix *y-* came to be positively identified in some way. We must assume that *y-* was reanalyzed as '3 m' only and not as '3 m or 3 pl' as would be necessary to preserve the proto-system distribution.

To see how this works, consider the relevant rules for Hebrew/South Arabian on the left in (100), with the relevant corresponding rules for Arabic/Tigre on the right in (101).

(100)	Heb. Mehri	(101)	Arab. Tigre
a.	<i>-ī</i> <i>-i</i> 2 f sg	a.	<i>n-</i> <i>ʔən-</i> 1 pl
b.	<i>nī-</i> <i>nə-</i> 1 pl		
c.	<i>yī-</i> <i>yə-</i> 3 m		
d.	<i>ʔe-</i> <i>ə-</i> 1	b.	<i>ʔ-</i> <i>ʔə-</i> 1
		c.	<i>t-</i> <i>tə-</i> 2
e.	<i>-nā</i> <i>-ən</i> pl f	d.	<i>-na</i> <i>-a</i> pl f
f.	<i>-ū</i> <i>-əm</i> pl	e.	<i>-uuna</i> <i>-o</i> pl
		f.	<i>-iina</i> <i>-i</i> f (2)
g.	<i>t-</i> <i>tə-</i> Else.	g.	<i>t-</i> <i>tə-</i> f
h.	<i>∅</i> <i>∅</i> Else.	h.	<i>y-</i> <i>lə-</i> Else.
		i.	<i>-u</i> <i>-∅</i> Else.

Observe that the two homophonous *t-* prefixes of Arabic/Tigre (101c,g) are cognate with the Elsewhere prefix of Hebrew/Mehri (100g). The elsewhere prefix of Arabic/Tigre (101h) is cognate with the '3 m' prefix of Hebrew/Mehri (100c). These prefixes are reordered automatically by the principles of rule-ordering outlined in the Spell-Out Ordering Hypothesis.

One consequence of the merger of *t-* '2' and *t-* 'f' as the elsewhere prefix is that the suffix rule (101f) must also be reanalyzed. The earlier rule has as its structural description 'f (2),' where (2) needs to be previously discharged for the rule to apply. Since the *t-* rule ceases to discharge '2,' then 'f (2)' cannot apply. To retain its former distribution, the suffix 'f (2)' is reanalyzed as the primary exponent of 2 f sg as in (100a).

The scenario I am proposing may be summarized as follows. The anterior system had *y-* as the elsewhere prefix and two homophonous *t-* prefixes. This homophony made the reanalysis of *t-* as the default prefix a likely occurrence. (I hesitate to say that it *motivated* the reanalysis. One might instead say it *potentiated* the reanalysis). Two branches of Semitic—Hebrew and S. Arabian—underwent this reanalysis.

An automatic consequence was the extension of *t-* to the 3 f pl form when *y-* came to be positively identified as specifically a *masculine* 3rd person prefix.

It would be natural to expect that such a reanalysis was not immediate nor entire within the relevant speech communities. In earliest Hebrew, for example, certain 3 f pl forms do indeed preserve the anterior state with *y-*, as noted by Brockelmann:

... there are found in Hebrew sporadic remnants of the formation in *j*, such as *ʔal-ljēhamnā* 'und sie entbrannt' Gen. 30: 38, *ʔal-ljīššarna* 'and they [kine] went straight out' 1 Sam. 6:12, *jā^cmōḏnā* 'they [four kingdoms] stand [up]' Dan. 8:22 [trans. mine].

Here the cognate of Arabic **y-* can be seen in the early Hebrew prefix *j*.

The closest relative of Hebrew is Phoenician: these two form the Canaanite branch of Northwest Semitic. Phoenician provides no evidence in this regard since what little evidence remains suggests that feminine gender was impoverished in the plural. In other words, Phoenician, like Egyptian Arabic, seems to have acquired the filter *[pl f], but at quite an early date. For example, Van den Branden (1969:46-7) cites the form *hmt*, normally the 3 m pl pronoun, in a phrase coreferent with a feminine plural noun *šnt* 'years'. The common gender 3 pl prefix is *y-*.

As A. Murtonen observes (1967:43), we cannot discern when this development took place in South Arabian either, since the relevant form is not preserved in inscriptions of ancient S. Arabian languages:

It is a pity indeed that no instances of this person have been preserved in ancient inscriptions [of South Arabian]; on the basis of the present material we must be content to establish that the use of *t-* even in the plural of the 3rd person feminine in all the known S. Arabic dialects is a remarkable distinctive characteristic between S. Arabic and Ethiopic languages...

Ugaritic and the language of the Tell Amarna letters, however, provide decisive evidence in favor of the reanalysis of *t-* as the elsewhere case. Ugaritic is the language of the texts discovered at Rās Šamra, dated to the 14th and 13th centuries B.C.E. The language of the Tell Amarna letters, dating from the 14th century B.C.E. is often called Canaanite, since it displays characteristics of the Canaanite branch, i.e. Hebrew and Phoenician. In all of these languages — Ugaritic, Hebrew, and Tell Amarna Canaanite — there appears a variability in the prefix for the 3rd person plural.

While all three languages display a more or less regular extension of *t-* to the 3 f pl, each also shows, to varying degrees, the *t-* appearing in the 3 *masculine* plural as well. This further extension has no natural explanation unless *t-* has been reanalyzed as an elsewhere prefix.

In Hebrew, this further extension of *t-* is limited to rather a few examples. These may be treated as the exception, rather than the rule. For example, Gordon (1947b:10) cites the following from Deut. 33:3:

(102) *w-hm t-kw l-rgl-k*
and-they T-are.smitten at-foot-thy
'and they are smitten at thy foot'

In the Ugaritic texts from Rās Šamra there is considerably variation in the realization of the 3 m pl. Herdner (1938) discusses the cases of *t-* appearing with masculine subjects in some detail. (Additional discussion appears in Gordon 1947a:63ff.) Among the attested cases, many can be explained

away by certain assumptions. For example, the gender of the subject noun may actually have been feminine (103).

- (103) *t-bl-k* *gr-m* *m?id* *ksp*
bring.IMPF-you mountain-PL much silver

'the mountains (will) bring you much silver'

Here it might be assumed that *gr-m* 'mountains,' is actually a feminine noun, although its plural ending is typical of masculines. Similarly, one might suppose that in Ugaritic, *inanimate* masculine plural nouns agree as feminines.

Brockelmann hints at such an explanation (1961:§260C, f. Ann.), surmising that the 3 m pl form might arise from the 3 f sg form with the masculine plural suffix. In support of such an idea, he alludes to the process of "deflected" agreement in Classical Arabic, whereby nonhuman plural nouns formed by prosodic changes ("broken" plurals) agree as if they were feminine singulars (Thackston 1984:18ff.):

- (104) a. *bayt-un* *kabiir-un*
house.MASC-INDEF big.MASC.SG.-INDEF.
'a big house'
- b. *buyūt-un* *kabiir-at-un*
houses.MASC-INDEF big.SG-FEM-INDEF
'big houses'

Herdner shows that this last hypothesis is untenable, since a good number of examples are attested in which *t*-appears for animals (105) or, more compellingly, specifically human (or divine) masculine plural subjects, (106) below.

- (105) *ʕl bt* *?ab-h* *nšr-m* *t-rhp-n*
over house father-his eagles-PL soar.IMPF-PL
'Over his father's house, eagles soar.'

In the following examples, the *t*- prefix appears on the verb and a coreferent masculine plural pronominal clitic *-hm* 'their' also appears in the phrase. These examples are particularly compelling insofar as syntactic (rather than interpretive) evidence leads to the conclusion that the subject is masculine.

- (106) *t-ʕl-n* *l-mrkb-t-hm*
they-climb on-chariot-PL-their
'they climb onto their chariots'
- (107) *t-š?u* *ʕil-m* *r?aš-t-hm*
they-raise god-PL head-PL-their
'The gods raise their heads'

A number of examples of 3 masculine *dual* also appear to show the *t*- prefix as well. Consider:

- (108) *t-š?a-n* *gh-m* *w-t-šh-n*
raise-DUAL? voice-PL and-cry-DUAL
'They (dual) raise their voices and cry'

In this example, Herdner (1938:81) points out that the subject refers to specifically two messengers who are mentioned by name (Gpn and ?Ugr) earlier in the text.

On the basis of these examples, however subject to possible alternative interpretation, it appears clear that the extension of *t*- to the 3 masculine plural, and quite probably the 3rd dual, was permissible, at least for some stages of Ugaritic. The full paradigm of forms (with vowelled reconstructions) appears below (Gordon 1947a:121):

(109) Ugaritic Prefix Conjugation. *mlk* 'to rule'

singular	dual	plural	
<i>y-mlk</i>	<i>y- ~ t-mlk-n</i>	<i>y- ~ t-mlk-n</i>	3 m
<i>t-mlk</i>	<i>t-mlk-n</i>	<i>y- ~ t-mlk-n</i>	3 f
<i>t-mlk</i>	<i>t-mlk-n</i>	<i>t-mlk-n</i>	2 m
<i>t-mlk-n</i>	id.	<i>t-mlk-n</i>	2
?- <i>mlk</i>	(unattested)	<i>n-mlk</i>	1
* <i>y-amluk-u</i>	* <i>y- ~ t-amluk-aani</i>	* <i>y- ~ t-amluk-uuna</i>	3 m
* <i>t-amluk-u</i>	* <i>t-amluk-aani</i>	* <i>y- ~ t-amluk-na</i>	3 f
* <i>t-amluk-u</i>	* <i>t-amluk-aani</i>	* <i>t-amluk-uuna</i>	2 m
* <i>t-amluk-iina</i>	id.	* <i>t-amluk-na</i>	2 f
*?- <i>amluk-u</i>	(unattested)	* <i>n-amluk-u</i>	1

The extension of *t-* appears much more frequently in Tell Amarna Canaanite. Herdner (1938:76) cites:

- (110) a. *t-idū* 'they know' (105,36)
 b. *t-idūkū* 'they killed' (75,33)
 c. *t-ilkū* 'they take' (84,32)
 d. *t-adinūni* 'they gave' (126, 63)

Brockelmann (1961: §260C, f. Anm.) cites in addition:

- (111) a. *t-ašpurūna* 'they send' (B. 58,123)
 b. *t-uballitūna* 'they (G. man) supply provisions' (L.13,56)
 c. *lā t-ugammārūna* 'so that they do not destroy, G. damit sie nicht vernichten' (L. 49, 25).

The frequency of such usage suggests that for Tell Amarna Canaanite, the extension of *t-* approached the rule rather than the exception.

According to my hypothesis, the Canaanite languages underwent a reanalysis whereby *t-* became the elsewhere prefix. Only by assuming this can it be explained how *t-*, formerly conditioned by '2' or 'f,' came to appear in a category

that was neither 2nd person nor feminine, and indeed in a set of forms (all 2nd and 3rd person forms except 3 m sg), which form no natural class.

One can explain the variability in the appearance of *t-* by assuming that *y-* was positively identified sometimes as '3 m sg' rather than '3 m.' In other words, the following rules applied in cases where *t-* appears in the 3 m dual and 3 m pl:

- (112) a. *y-* 3 m sg
 b. *n-* 1 pl
 c. ? 1
 b. *t-* Elsewhere

Reanalysis of *y-* as specifically singular allows *t-* as the Elsewhere prefix to appear automatically in the 3 m pl and 3 m dual in Ugaritic and Tell Amarna Canaanite. This rule system differs only minimally from the system in which *t-* does not extend to the masculine forms (Hebrew, some Ugaritic), where *y-* is '3 m' only (cf. rule system (100)).

In this way, the extension of *t-* receives a simple explanation, and a long-standing puzzle of Semitic historical morphology is solved. One need no longer appeal to "false analogical formation," (cf. Brockelmann 1961 §260C, f. Anm.) or other pseudo-explanations.

From a theoretical point of view, the analysis I have presented crucially relies on the notion that some affix may be an Elsewhere affix, devoid of feature content, and realized only if no other more specific affix may fill a position of exponence. Moreover, the choice of which affix is the Elsewhere affix is subject to historical change.

Lexical affix-based models require that each affix have some feature content as part of its lexical representation, and, as I have already discussed, cannot permit the notion of an Elsewhere affix. Therefore, the lexical affix-based model will be unable to express the extension of *t-* in Ugaritic and Tell Amarna Canaanite as a natural historical process. For this reason, I assume that the lexical affix model is explanatorily inadequate without further modification.

1.16 THE LOSS AND REAPPEARANCE OF T- 'FEM' IN AKKADIAN

Within Semitic, Old Akkadian (2500-2000 B.C.E.) displays the archaic Semitic pattern of prefixes. After 2000 B.C.E. Akkadian split into two dialects: Babylonian, spoken in the southern region of Mesopotamia, and Assyrian, spoken in the northern region. Babylonian shows an interesting development: instead of showing the regular *t-* in the 3 f sg, Babylonian documents regularly have *i-* in both genders in the 3rd person (von Soden 1969:69).²² An example paradigm from Babylonian is shown in (113), (Reiner 1966: 70).

(113)	<i>Babylonian Prefix Conjugation. (Preterite) p r s</i>	
	singular	plural
3m	<i>i-prus</i>	<i>i-prus-u</i>
3f	<i>i-prus</i>	<i>i-prus-a</i>
2m	<i>ta-prus</i>	<i>ta-prus-a</i>
2f	<i>ta-prus-i</i>	<i>ta-prus-a</i>
1	<i>a-prus</i>	<i>ni-prus</i>

For Old Akkadian 3 f sg *ta-prus*, Babylonian regularly has *i-prus*. Assyrian, however, continues the Old Akkadian pattern. The loss of *ta- 'f'* was of course not immediate, and there are some instances of archaism in Old Babylonian (von Soden 1969:99).

Recall that according to the analysis I have presented, the oldest Semitic system contains two homophonous prefixes *t- '2'* and *t- 'f'*. I argued in the last section that this homophony made the reanalysis of *t-* as the elsewhere prefix a plausible development. Inversely, the development seen in Babylonian suggests that *t- 'f'* was lost and that **y-* (Akk. *i-*) spread to fill the place of *t-*.

Simple loss of *ta- 'f'* suffices to derive the change from Old Akkadian to Babylonian. However, we should like to discover some way of expressing this loss as a natural development. Consider first the affixes which derive the Old Akkadian forms:

(114) Old Akkadian (and Assyrian)

a.	<i>ni-</i>	1 pl
b.	<i>a-</i>	1
c.	<i>ta-</i>	2
d.	<i>ta-</i>	f
e.	<i>i-</i>	Elsewhere

The Babylonian forms can be derived by the same rules except (114d).

However, a more explanatory scenario can be constructed to express the change. Suppose *ta-* was reanalyzed as the Elsewhere prefix, causing *i-* to be positively identified. I argued in the last section that precisely this reanalysis took place in the Canaanite branch. If *i-* were positively identified as '3' in Babylonian instead of as '3 m' as in Hebrew, or '3 m sg' as in Ugaritic and Tell Amarna Canaanite, then *i-* would spread automatically to the 3 f sg. To see this, consider the rules that would result in such a case:

(115) Standard Babylonian

a.	<i>ni-</i>	1 pl
b.	<i>a-</i>	1
c.	<i>i-</i>	3
d.	<i>t-</i>	Elsewhere

For a 3 f sg input, (115c) will apply deriving *i-prus* in (Standard) Babylonian. Now the elsewhere rule will *de facto* apply only to the 2nd person forms.

In a further development, von Soden (1969:99) notes that in the last phase of New Babylonian, referred to as Late Babylonian (Spätbabylonisch), attested from 600 B.C.E., *ta-* reappears in the 3 f sg. In other words, the Late Babylonian system is identical in this respect to the Old Akkadian and Assyrian systems. Because late Babylonian came heavily under the influence of (Classical) Aramaic, von Soden attributes this development to Aramaic influence. Aramaic retains the archaic Semitic prefix pattern.

To understand this final development, consider first the Babylonian rule system in (115). I will assume, following C.

Watkins (1962), that a category marked 3rd person singular, or as here, 3rd person alone, tends automatically to be reanalyzed as the elsewhere or least marked case in any morphological system. If this is so, one should expect that the Babylonian system should be reclaimed by successive generations as:

(116) *New Babylonian*

- | | |
|---------------|-----------|
| a. <i>ni-</i> | 1 pl |
| b. <i>a-</i> | 1 |
| c. <i>t-</i> | 2 |
| d. <i>i-</i> | Elsewhere |

Note that the *t-* prefix is now only '2.' During the intermediate stage of Standard Babylonian, *t-* no longer appeared in the 3 f sg, and so, when positively identified, it was reanalyzed only as '2.'

It appears that under the influence of Aramaic, New Babylonian (re-)acquired the archaic *ta- 'f'* prefix. Adding this rule to (116) automatically derives the Late Babylonian system, which is in fact identical to the Old Akkadian and Assyrian system in (114).

To summarize, Old Akkadian shows the archaic prefix pattern of Semitic. As such, it displayed the two homophonous *t-* prefixes. The loss of *t-* in (Standard) Babylonian may be seen as the reanalysis of *t-* as the Elsewhere prefix followed by reanalysis of **y-* (Akk. *i-*) as '3' only. We thus discern three responses to the reanalysis of *t-* as the elsewhere prefix:

- | | |
|----------------------|--|
| (117) Proto-Semitic: | <i>*t-</i> '2'; <i>*t-</i> 'f'; <i>*y-</i> Elsewhere |
| Babylonian: | <i>i-</i> '3'; <i>t-</i> Elsewhere |
| Hebrew: | <i>y-</i> '3 m'; <i>t-</i> Elsewhere |
| Ugaritic, Canaanite: | <i>y-</i> '3 m sg'; <i>t-</i> Elsewhere |

In each case, upon losing its status as Elsewhere prefix, **y-* came to be positively identified in a different way. To retain the archaic distribution, *y-* would need to be positively identified disjunctively: '3 m or 3 pl.' Babylonian simplified this disjunction to '3,' and Hebrew to '3 m.' Ugaritic and Canaanite went further and reanalyzed *y-* as '3 m sg.' The more

specifically *y-* was positively identified, the more the elsewhere prefix *t-* spread through the paradigm.

Finally, I argued that, owing to the universal tendency for '3' or '3 sg' affixes to be reanalyzed as elsewhere affixes (deriving from Watkins' observation), the Babylonian system changed such that *t-* was positively identified as '2' and *i-* again became the elsewhere prefix. The reappearance of archaic *t- 'f'* in Late Babylonian under Aramaic influence can then be analyzed simply as the gain of the *t- 'f'* affix within this system.

The hypothesized developments are shown below:

- | | | | | | | | |
|-------|------------|------|------------|------|------------|------|------------|
| (118) | Old Akk. | > | Bab. | > | New Bab. | > | Late Bab. |
| | <i>ta-</i> | 2 | <i>i-</i> | 3 | <i>ta-</i> | 2 | <i>ta-</i> |
| | <i>ta-</i> | f | | | <i>ta-</i> | f | <i>ta-</i> |
| | <i>i-</i> | Els. | <i>ta-</i> | Els. | <i>i-</i> | Els. | <i>i-</i> |

1.17 FEATURE-CHANGING SYNCRETISM

The analysis presented up to this point has assumed that the two *t-* prefixes seen in Classical Arabic or Old Akkadian are separate but homophonous affixes. In this section I detail another possible analysis in which this relationship is treated not as an accidental homophony, but rather as a deeper syncretism.

What is required is a *feature-changing* rule operating on morphosyntactic representations before the phonological realization of affixes. Consider the following such rule:

- (119) 3 → 2 in env. f (sg, dual)

This rule changes a 3rd person feature to a 2nd person feature in the environment of f and singular or dual.²³ This rule precedes the rules in (120):

- | | | | |
|-------|----|-----------|-----------|
| (120) | a. | <i>n-</i> | 1 pl |
| | b. | <i>ʔ-</i> | 1 |
| | c. | <i>y-</i> | 3 |
| | d. | <i>t-</i> | Elsewhere |

The effect of rule (119) is essentially to bleed the application of (120c) from the 3 f sg and 3 f dual forms. For example, an input AGR 3 f sg will be changed to 2 f sg by (119). When the rules in (120) apply, rule (120c) will not apply and the form will receive the elsewhere prefix *t-* by rule (120d).

By assuming the feature-changing rule in (119), it is no longer necessary to assume that Proto-Semitic (and hence Classical Arabic) system had two homophonous *t-* affixes. On the one hand, such an analysis is attractive because it treats the relationship between the feminine nonplural and 2nd person as a deep syncretism rather than a phonological accident (homophony). Because *t-* appears in both the 3 f sg and the 2 categories in Cushitic as well as Semitic, it appears that this relationship is indeed quite archaic.

Furthermore, there seems to be an independent need for feature-changing syncretism rules in morphology. For example, in Russian the genitive of a declension 1 singular noun (or masculine adjective) or any plural noun is either the nominative if the noun is inanimate, or genitive if the noun is animate.²⁴ Examples of declension 1 singular nouns are given in (121).

(121) Russian noun syncretism			
	nom.sg.	gen.sg.	acc.sg.
anim.	'writer' <i>pisátel'</i>	<i>pisátel'a</i>	<i>pisátel'a</i>
inan.	'museum' <i>muzéj</i>	<i>muzéja</i>	<i>muzéj</i>

Halle (1995) has proposed rules like those in (122) to derive these syncretisms directly:

- (122) a. ACC → GEN / decl. 1 or plural animate
 b. ACC → NOM / decl. 1 or plural inanimate

If Halle is correct in supposing that feature-changing rules like these are permitted in morphology, then there is no *a priori* reason to suppose that similar rules are not responsible for the *t-* syncretism in Semitic.

On the other hand, other factors suggest that the *t-* syncretism is in fact a homophony. First of all, it should be

observed that the rule as formulated in (119) is a somewhat specific rule. In particular it is constrained not to apply in the 3 f pl. Recall that on the discontinuous bleeding analysis, 3 f pl is special because 'f pl' has its own affix, *-na*, which bleeds 'f' from the prefix position, allowing elsewhere *y-* to appear. The feature-changing analysis cannot capture this fact except by stipulation — albeit a negative sort of stipulation — that is, the failure of (119) to apply in the 3 f pl. In the discontinuous bleeding/homophony analysis the failure of *t-* to appear in the 3 f pl follows automatically and without stipulation.

Second, it is conceptually bizarre that rule (119) changes the 3 category to a category — 2 — which has no explicit spell-out. The effect of (119) is to bleed forms into the elsewhere class. In general, where feature-changing rules appear well motivated, bleeding is into an explicit category with a distinct realization.

Third, one must consider how a rule like (119) could have arisen historically. Because *t-* has uses both as a 2nd person marker and as a feminine marker (nominal *-at*, for example), the standard assumption has been that the two *t-* prefixes were originally merely homophonous. Therefore, the homophony analysis must be correct at some stage.

The final conclusion may be that both the homophony and the feature-changing analyses have merit and are applicable to different stages of Afroasiatic. At the deepest level, both analyses derive the facts by a bleeding relation, whether by feature-changing or by discharge at different string positions.

The historical changes detailed in the last two sections can receive accounts in the feature-changing analysis. For example, the loss of *t-* 'f' in Babylonian can be understood as loss of rule (119). The reappearance of *t-* 'f' in Late Babylonian is the addition of rule (119), borrowed from Aramaic. The spread of *t-* in Hebrew is the loss of 'sg/dual' form rule (119). For now, I leave open the question of to what degree feature-changing analyses are to be permitted. In Chapter 3, I will show that the conversion of duals and trials to plurals in Nunggubuyu is not a structure-changing syncretism but rather a two-step process of deletion and insertion, which is another possible avenue of analysis for what appear to be structure-changing processes.

Because feature-changing rules are so powerful (any category could become any other in principle), they should either be impossible or highly costly within an evaluation of grammatical complexity. Lumsden (1992:472-3) has in particular argued against feature-changing syncretism rules on general grounds:

If these rules change the feature-values of the underlying positions, then the underlying distribution of features has very little relation to the semantic/syntactic environment. That is, there is no longer any systematic relationship between the distribution of features in syntactic positions and the semantic/syntactic significance that is associated with feature labels. Ultimately, this complex of rules has no motivation other than to mechanically describe the distribution of forms in the surface structure.

A number of counterarguments might be presented to Lumsden's complaint. First, after syntax and within a component of Morphology, there is no reason to suppose that morphosyntactic labels still have any semantic or syntactic "significance." In other words, if a feature ACC is changed to GEN in Morphology, then the label GEN at that position has only morphological significance *at that point in the derivation*. Second, there is in fact a "systematic" relationship of features (representing semantic/syntactic environments) to their changed-feature counterparts (representing morphological signals), and that relationship is the set of feature-changing rules themselves. To quarrel with this relationship is to deny that there can be feature-changing rules, and that is precisely the question at hand. Finally, we must carefully examine what constitutes the "motivation" of a set of rules. Here again, the question does not hinge on descriptive adequacy, since feature-changing analyses are no more descriptively adequate than others: the question is rather what properties of a feature-changing analysis would make it a mere "mechanical description."

Clearly, arguments for or against feature-changing syncretism must address the question of learnability, as

theoretically embodied in an evaluation of cost. A feature-changing syncretism analysis is indeed very abstract and complex, insofar as the systematic relationship between semantic and syntactic environments and morphological signals is *non-transparent* and mediated by feature-changing rules. The question becomes whether such abstraction and complexity are admissible, by which it can only be meant, learnable. Feature-changing analyses in morphology, like those in phonology, must be committed to the idea that features are mental entities figuring in the computation of surface forms and not somehow mere transparent reflexes of surface forms.

In light of the data from Russian, it may be too hasty to conclude that feature changing syncretisms are unlearnable. A more cautious conclusion is that they are learnable only given a sufficient stimulus, that is to say, such rules are highly costly. If alternative analyses exist, they are presumably less costly and therefore more likely to reflect speaker's knowledge of morphology. On these grounds, I will not advocate the feature-changing analysis for the Semitic forms, since I have presented what I believe to be a less costly homophony analysis.

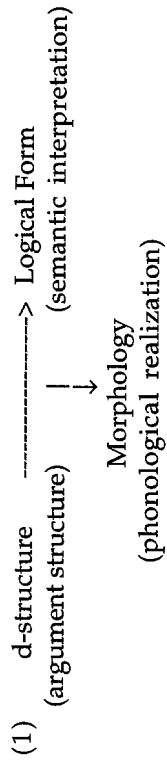
II

Towards a Theory of Person and Number Features

2.0 INTRODUCTION

In this chapter I detail a theory of person and number features. Any theory of person-number features must have three goals. The first is to predict what are the possible person-number categories in human language. The second goal is to show what person-number categories consist of: how they are represented and interpreted at the various levels of grammar. The third goal is to establish an evaluation metric according to which certain categories and inventories are understood as complex while others are simple from the point of view of language acquisition.

In chapter 1 and in the Introduction, I argued for a component, Morphology, which occurs after syntax and derives well-formed inflected words. In this component, rules of Morphology linearize syntactic constituents and convert abstract morphosyntactic representations to phonological strings. Similarly, I will be assuming an interpretive semantics, which subjects the output of syntax to rules of semantic interpretation. The model envisioned is as below:



I will assume for simplicity that the same features figure in rules of phonological realization (Morphology) as figure in rules of semantic interpretation (Logical Form). This is not a necessary assumption. For example, one could assume that there are two sets of features, category features for Morphology, and semantic features at LF, and a universal principle mapping between these. I will not be pursuing this option, since, on my view, it entails an unnecessary complication.

The optimal theory of person-number features will by hypothesis allow straightforward interpretation at LF and realization at Morphology.

To give a simple example, assume that there is a person feature [1] and a number feature [plural]. In English at the morphological level, if these features are attached to a pronoun (D) which receives nominative case, this D will be realized phonologically as the string [wē] 'we.' At LF, [1] and [plural] condition rules of semantic interpretation requiring (1) that the speaker of the utterance have in mind himself or herself as one member of reference set of the argument associated with the pronoun, and (2) that the reference set is nonsingleton, i.e. contains at least two members.

Although this is a bit simplistic, the general picture is roughly of this form.

2.1 PERSON FEATURES

2.1.1 Defining the Semantic Question

It has been usually assumed that the person categories are defined in terms of features such as [\pm speaker], [\pm hearer], as for example in Ingram's (1971/1978) cross-linguistic study of the person categories. In this section, I present the assumptions about semantic interpretation that underlie the postulation of such primitive features and not others.

The interpretation of person features must recognize certain *discourse roles* as primitives: these roles are among the deictic markers of a speech-act, situating the speech-act with respect to its place, time, and, in the case of person features, its participants. The primary distinction is between participants

in the speech-act and nonparticipants, what Hockett (1966) refers to as "local" vs. "nonlocal" arguments. The speaker and hearer are local participants, while other parties, neither speaker nor hearer, are nonlocal nonparticipants:

- (2) participants: speaker or hearer
nonparticipants: neither speaker nor hearer

The participant division can be subdivided into speakers and hearers.¹ I will use numerals to designate these subroles:

- (3) 1 = speaker
2 = hearer
3 = not speaker, not hearer

I will be assuming that all syntactic arguments bear anaphoric indices of the type proposed in Chomsky (1981) and Lasnik (1981). Such indices are applied freely to arguments subject to the condition that arguments bearing the same indices be coreferent. (Inversely, "accidentally" coreferent arguments need not bear the same indices.) What is important for the theory of person number features is that discourse roles are assigned to anaphoric indices and not to real world referents.

To understand this consider:

- (4) Cicero_(i) and Tully_(j), why, they_(i,j) are just one guy_(k)!

The names *Cicero* and *Tully* refer to the same real world individual, but, from the point of view of anaphoric indexation, they bear distinct indices {i} and {j}. For this reason, the plural pronoun *they* may be used to refer to the two *concepts* of the same real world individual. It is to such concepts, as identified by anaphoric indices, that discourse roles are assigned.

It is therefore possible, for any given sentence, to set up an assignment of discourse roles to anaphoric indices in the manner of a function from indices to roles. For example, sentence (4) could have the assignment:

- (5) {⟨i, 3⟩, ⟨j, 3⟩, ⟨k, 3⟩}

Any sentence will have such an assignment of discourse roles, and I will assume that such an assignment is free.² For expository convenience, I will write N for the set of roles to which the set of indices of a given argument is paired by this assignment. For example, all three arguments in (4) will have $N = \{3\}$.

2.1.1.2 Natural Language Person Syncretisms

Let us now consider some examples of such sets N:

- (6) a. {1}
 b. {2}
 c. {3}
 d. {1, 2}
 e. {1, 3}
 f. {2, 3}
 g. {1, 2, 3}

There are obviously seven distinct sets which may be formed from the three discourse roles. Less obvious is that natural languages do not employ a seven-way distinction, but instead have a maximal division of four person categories, as shown in (7):

- (7) a. {1} or {1, 3} 1st person (exclusive)
 b. {1, 2} or {1, 2, 3} 1st person (inclusive)
 c. {2} or {2, 3} 2nd person
 d. {3} 3rd person

Although certain languages permit compound pronominal forms which demand a greater subdivision of person types, I will show how these may all be understood as arising from the incorporation of one pronoun type in (7) into another.

There is no "exclusive/inclusive" distinction for the 2nd person: (6c) and (6f) invariably fall together. In other words, there is no language with simplex pronouns distinguishing {2} from {2, 3}, that is, an argument picking out only hearers to the exclusion of non-hearers, {2} only.

Greenberg (1988:14) sums up this universal:

[there is] a universal principle, with a few rare and doubtful exceptions, namely that languages do not distinguish in what are usually called second person nonsingulars between 2 and 3, as long as the sets (2, 2), (2, 2, 2) etc. are present depending on the appropriate number category.

By (2, 2) Greenberg means (in effect) two indices assigned the role 2, i.e. something like $\{x, 2\}$, $\{y, 2\}$.

Similarly, there is no distinction between {1, 2} and {1, 2, 3}. No 1st person inclusive {1, 2} argument necessarily excludes {3}. For example, in English the pronoun *we* can never in principle exclude a party not addressed. For example, if I say, "we learn more about morphology every day," there must always be in principle an interpretation in which "we" may include any third party. The same is true in all languages. I will later show that an alleged counterexample from Sierra Popoluca (Foster & Foster 1948, Zwicky 1977), has been misanalyzed.

Finally, no language has a distinction between {1} and {1, 3}. This fact becomes obvious in the plural: no language has a 1st person plural argument with only multiple speakers, i.e. just the role {1}.

The task at hand is to give a set of person features which permits all and only those syncretisms which are observed. To this end, consider how the four person categories may be represented using parentheses for the optional role(s):

- (8) a. {1, (3)} 1st person (exclusive)
 b. {1, 2, (3)} 1st person (inclusive)
 c. {2, (3)} 2nd person
 d. {3} 3rd person

The following generalization emerges:

- (9) *Generalization I:*
 No person category specifically excludes {3}.

Of course, in the singular, 1st person exclusive and 2nd person exclude {3}, but only indirectly, in virtue of having only one index and therefore being unable to have more than one role. Because no category excludes {3}, there can be no feature [-3] which could enforce this exclusion. Categories in (6) rendered impossible by Generalization I include: {1}, {2}, and {1, 2}, since each of these excludes {3}.

Additionally, another pattern can be discerned in (8):

(10) *Generalization II:*

Unless {3} is the only permitted role (= 3rd person), {3} is optional.

In other words, except for the 3rd person, no category specifically *requires* the role {3}. Recall now that there is a major bifurcation of discourse roles into participants {1, 2} and non-participants {3}. The generalization can now be restated:

(11) *Generalization II (Revised):*

Only an argument which excludes participants can require {3}.

Another way to understand this is that the 3rd person can be viewed in two ways. It can be defined as that category which is specifically nonparticipant (i.e. Benveniste 1956/1972: "the non-person") or as that category which specifically requires {3}, that is, the [+3] category.

Clearly, a feature such as [+3] is too powerful, since, other things being equal, we should expect a distinction between {2} and {2, 3}, with the latter specifically demanding a third person. Instead, I will follow Farkas (1990) in assuming that the 3rd person is defined as [-participant], i.e. that category excluding the roles {1, 2}. Since {3} is the only remaining role, a [-participant] category is *de facto* a {3} category.

Categories in (6) which are rendered impossible by Generalization II are: {1, 3}, {2, 3}, and {1, 2, 3}. Each of these requires {3} but does not exclude {1} or {2}.

Generalizations I and II also suffice to exclude a number of categories which can be logically composed from the sets in (6). These are given below:

(12)	Set	Generalizations Flouted
		I II
a.	{{1}, 2}	* *
b.	{{1}, 3}	* *
c.	{{2}, 3}	* *
d.	{1, {2}}	* *
e.	{{1}, 2, 3}	* *
f.	{1, {2}, 3}	* *
g.	{{1}, {2}, 3}	* *

As can be seen above, all the pseudo-categories which flout Generalization I exclude {3}; the ones which flout Generalization II require {3} while permitting {1} or {2} or both. I follow Ingram (1971/1978) and Hale (1973) in postulating the features [+I] and [+you] or their notational equivalents to define the remaining permissible categories as below:

(13)	[±I]	[±you]	[±participant]	sets	name
	+	-	+	{1, {3}}	1st excl
	+	+	+	{1, 2, {3}}	1st incl
	-	+	+	{2, {3}}	2nd
	-	-	-	{3}	3rd

The feature [+I] requires {1}; the feature [-I] excludes {1} and likewise for [+you] for the {2} role. The feature [-participant] excludes {1} and {2}; the feature [+participant] requires *either* {1} or {2} (but not necessarily both). Note that the value [+participant] does not exclude {3}, it merely requires {1} or {2}. In this way, no category can be made to specifically exclude {3}.

I will assume that the features above condition the appropriate rules of semantic interpretation at LF via the assignment of discourse roles to anaphoric indices at a level of discourse representation.

Given that there are only four categories in (13), the minimal number of features which can differentiate these four

is two. The value of the feature [\pm participant] is always redundant if the values for [\pm I] and [\pm you] are known. In the next section I review evidence for why the value [\pm participant] is a natural class in morphology.

2.1.3 The Value [\pm participant]

A number of morphological rules refer to the [\pm participant] categories as a natural class and therefore provide evidence that [\pm participant] is a feature visible at Morphology. I will cite several of these examples.

The first case comes from Winnebago (Lipkind 1945, Ken Hale, p.c.). The Winnebago free personal pronouns distinguish only [\pm participant]:

- (14) *nee* 'I' or 'you' [\pm participant]
 ʔee 'he/she' [-participant]

Disambiguation of 'I' and 'you' is accomplished through verbal morphology. It is important to note that neither the set notation nor a feature system without [\pm participant] can capture the class of {1} or {2}. Similarly in Winnebago, the augmented number suffix is *-wi* for 1st and 2nd person subjects, but *-ire* for third person subjects. Again the morphological split is between the [\pm participant] categories (*-wi*) and the [-participant] ones (*-ire*).

The second case comes from Navajo. 1st and 2nd person plural pronouns are homophonous (Ken Hale, p.c.):

- (15) a. *nihí* 'we/you (pl)' independent
 b. *-nihi-* 'we/you (pl)' object clitic (toneless)

Finally, 1st and 2nd person accusative agreement affixes are homophonous in Lummi, a Salish language of British Columbia (Jelinek 1992). Consider the following examples:³

- (16) a. *t'əm'-t-óʔəs = sx^w*
 hit-CT-1sg ACC=2sg NOM
 'You hit me.'
- b. *t'əm'-t-óʔəs = sən*
 hit-CT-2sg ACC=1sg NOM
 'I hit you.'
- c. *t'əm'-t-óʔət = sx^w*
 hit-CT-1pl ACC=2sg NOM
 'You hit us.'

In (16a) and (16b), the same affix *-óʔəs* realizes a 1sg object agreement or a 2sg object agreement. In (16c) a distinct form *-óʔət* realizes a 1pl object. Jelinek reports that 2nd plural is identical to 2 sg as well. The realizations of the accusative agreement affixes must be:

- (17) a. [\pm participant +I -sg] *óʔət*
 b. [\pm participant] *óʔəs*

Rule/affix (17a) will be realized first since it is more specific. The class of categories which are realized as *óʔəs* form an elsewhere class defined by [\pm participant]. This provides more evidence that [\pm participant] is a morphologically active feature in at least some languages.

2.1.4 A Universal Hierarchy of Persons?

Not all languages have the four way distinction permitted in (13). In particular, the inclusive/exclusive distinction is absent from Indo-European and Semitic, among other language families. The first person arguments in these languages have the discourse roles {1, (2), (3)}. The three persons, in say, English, are as below:

- (18) {1, (2), (3)} 1st person (generic)
 {2, (3)} 2nd person
 {3} 3rd person

As Zwicky (1977) observes, it is significant that no language has a functional syncretism of the sort:

- (19) *{ (1), 2, (3) } 'syou'

'Syoun' requires at least one addressee, and may include any others, including the speaker. Nothing said so far will exclude this category, which is the syncretism of 1st inclusive and 2nd person. (I delay discussion of the alleged 'syoun' of Algonquian until the next section.) 'Syoun' passes by Generalization I since it doesn't exclude {3}, nor does it require {3}, so it passes Generalization II. Why shouldn't 'syoun' be a possible category? Compare the generic 1st person as in English with 'syoun':

- (20) {1, (2), (3)} 1st person (generic) 'we'
 {(1), 2, (3)} 'syoun'

'Syoun' is like 'we' except that, rather than having {2} optional, {1} is optional.

In order to exclude 'syoun,' we must appeal to a third Generalization:

- (21) *Generalization III:*
 The {1} role can never be optional.

In other words, a category either necessarily includes the speaker {1}, or necessarily excludes the speaker. Generalization III will also exclude (12a, b, g, e) as well as 'syoun.'

Although he presents the matter in rather different terms, Zwicky (1977) suggests that there exists a Universal Hierarchy of Persons of the form

- (22) *Universal Hierarchy of Persons (UHP)*
 1 > 2 > 3

In the terms presented here, this hierarchy has the following correlate. We have already observed that the {3} role is optional unless it is the only role required. Now consider the {2} role. Observe that the {2} role is optional only in case the {1} role is obligatory (in the generic 1st person). In such a case, the {3} role is also optional. Finally, the {1} role is never optional. We can make the following generalization:

- (23) *Generalization IV:*

A role may be optional only if a higher role on the hierarchy is required.

Now that we have these descriptive generalizations the question becomes how to make them follow from the theory of person features. Recall that Generalizations I and II follow from the absence of [+3]. Some aspect of the theory must now permit 'we' while barring 'syoun.'

Consider these two categories in feature terms:

- (24) [+I oyou] 'we'
 [od +you] 'syoun'

The 'we' category requires the role {1} and optionally includes {2}. This translates to any value for [+you], whether [+you] (including the addressee) or [-you] (excluding the addressee) is fine. The inverse situation holds of 'syoun' with {1} being the optional role.

How do such "underspecified" categories come about? I argued in the Introduction that fully specified morphosyntactic categories are impoverished at the level of Morphology by language-specific filters. The filter which gives rise to the syncretism of 1st inclusive and exclusive as a generic 1st person category is:

- (25) *[-I oyou]

Recall that by the Feature Hierarchy Hypothesis (section 1.10), filters must be combined with feature hierarchies to determine which feature will be deleted in an offending combination. Here I postulate a simple hierarchy:

(26) I > you

When encountering a matrix containing a value for both [+I] and some value for [±you], the filter (25) combined with the hierarchy (26) will delete the value for [±you]. Thus, 1st inclusive and 1st exclusive neutralize to a generic [+I] category.

Because of the hierarchy of features (26), a neutralization of the type 'you' cannot come about through Impoverishment. This is because the 'you' category can be derived only by deleting [±I] in the presence of [+you] with a filter of the form *[±I +you]. This deletion cannot happen since such deletions always obey the hierarchy of features.

Returning now to the Universal Hierarchy of persons, it is clear that it is not wholly necessary. The conditions on the appearance of role (3) follow from the definition of [±participant], which captures both Generalizations I and II, and need not be separately stipulated. This leaves only the mini-hierarchy among participant features in (26).

Not all languages have the filter (25). Following the ideas of Calabrese (1988, 1995) as presented in the Introduction, I will assume that the filter in (25) as well as the various person features and their semantic interpretations and implicational relations are part of Universal Grammar. When positive evidence presented to a child shows that 1st inclusive and 1st exclusive are distinct categories, then the filter (25) is "switched off."

In section 2.1.7 I return to other filters of the person system, showing how a hierarchy among these can derive an evaluation of complexity for person inventories.

2.1.5 The Putative 'you' of Algonquian

There has been considerable puzzlement in the literature surrounding a putative case of 'you' in the Algonquian languages (Zwicky 1977, Jolley 1983). In the verbal and nominal morphology, both 1st person inclusive and 2nd person take the clitic (Proto-Algonquian) *k- or its reflex in the

various Algonquian languages, while 1st exclusive takes *n-. One might then be led to suppose that *k- represents 'you.'

However, this is not a systematic neutralization at the level of Impoverishment. In other words, the 1st inclusive and 2nd person categories continue to be distinct in the Morphological component, but *happen* to take the same clitic prefix. These two categories are distinguished by suffixal morphology and are not fully neutralized. Consider the examples from Plains Cree (Bellegarde & Ratt 1989:38-39):

- (27) a. *ni-miciso-nān*
1CL - eat- 1 pl indic
'We (excl.) eat.'
- b. *ki-miciso-nāwāw*
2CL - eat- 2 pl indic
'You (pl) eat.'
- c. *ki-miciso-naw*
2CL - eat - 2I indic
'We (incl.) eat.'

The prefixed clitics have the following forms:⁴

- (28) a. [+I -you] *ni(t)-*
b. [+you] *ki(t)-*

Although rule (28b) collects the class of [+you] categories, 1st inclusive and 2nd person, these remain distinct in Morphology, because 1st person inclusive and 2nd person have distinct agreement suffixes, *-nāwāw* for 2nd plural and *-naw* for 1st inclusive.⁵ The [±I] feature distinguishing them must not be deleted by Impoverishment. The syncretism of 1st exclusive and 2nd is a property of the rules which realize the shape of the clitic prefix. Spell-out rules of this sort may refer to any natural class defined by a feature, here [+you]. This does *not* mean that Algonquian has a category 'you.' To have such a morphological category, in the terms presented here, is to have

a rule of Impoverishment which combines 1st inclusive and 2nd person. Algonquian has no such rule: the neutralization of the value [±I] is only at the level of spell-out (realization of *k*-).

One reason why a solution of this sort was (implicitly) deemed objectionable by Zwicky (1977), for example, is that it requires reference to the value [-you] in rule (28a). Zwicky argues that morphological realization rules —whether of the sort which realize phonological material (spell-out) or of the sort which sequence this material (templates, M^0 splitting operations) — do not refer to the negative values [-I] or [-you]. It was accordingly understood as desirable to eliminate these values from morphological representation totally. The five possible categories can then be represented as below:

(29)	[+I]	[-you]	Name
	+	∅	1st person
	+	+	1st person inclusive
	∅	+	2nd person
	∅	∅	3rd person

Unfortunately, such a scheme, partly implicit in Zwicky's (1977) conception of morphosyntactic category features, is too ambitious. While it is generally true that morphological rules "see" only the [+I] values for the features [±I] and [±you], I now consider evidence that shows that, at least *some of the time*, the values [-I] and [-you] must remain visible in morphological representation.

III

Problems in Multiple Argument Agreement

3.0 INTRODUCTION

Languages whose verbs show agreement with more than one argument present special complications for any theory of inflection. The complications fall under three broad and interactive headings, which are not specific to multiple-argument agreement but whose relevance is highlighted within these complex morphological systems. These are the problems of Neutralization of categories, Placing of affixes, and Licensing of affixes. After a discussion of each of these in general terms, section 3.2 presents a thorough analysis of the Nunggubuyu transitive clitic sequences, with attention to Neutralization (3.2.2) and Placing (3.2.3–3.2.4). Neutralization of categories when both arguments are [+participant] is discussed in section 3.3, followed by a brief exposition of the Ket verb-word, with attention to the Placing of the INFL constituent within the complex verb (section 3.4).

3.0.1 *The Neutralization Problem*

First, if a language has many person-number-gender categories for intransitive agreement, it is usually the case that there are considerable neutralizations in the paradigm for agreement with two or more arguments. At first glance, it might be supposed that that system would be simplest which fully cross-classified all possible intransitive arguments to produce a fully

differentiated matrix of agreement for two arguments. In fact, massive neutralizations usually occur, such that, for example, specialized combinations like '1st person exclusive dual acts on 2nd person dual' are rarely if ever encountered, even in languages which have duals for intransitive agreement. I shall refer to this problem as the Neutralization Problem.

Attention was first called to the Neutralization Problem for Warlpiri in Hale (1973:330–31). Hale discovered that specifically dual forms exist for all three persons for intransitive agreement in Warlpiri, but the dual tends to be "replaced" by the plural in certain combinations when both subject and object are nonsingular. The two dialects of Warlpiri, Eastern and Western, differ in regard to how extensive this replacement is. In the Eastern dialect, "if both the subject and object are nonsingular, only plural clitics are allowed":

- (1) *ngajarra-rlu ka-rna-lu-nyarra nyumpala nya-nyi*
 we-ERG present-1-pl-2pl you see-nonpast
 'We two see you two.'

In Western Warlpiri, however, the facts are more complicated. Dual is replaced by plural obligatorily when both subject and object are dual, and only one dual must be replaced. The dual which is replaced is that which is lowest in the hierarchy $1 > 2 > 3$:

- (2) *nyumpala-rlu ka-nku-lu-jarrangku ngajarra nya-nyi*
 you-ERG present-2-pl-1du us see-nonpast
 'You two saw us two.'

A hierarchy of features here dictates the direction of neutralization. Therefore, it seems plausible to assume that the neutralizations in Warlpiri and in other multiple-argument systems result from Impoverishment of morphosyntactic representations which have become too complex, depending on language-particular (or even dialect-particular) constraints on complexity. As discussed in the Introduction, Impoverishment in principle obeys the hierarchy

of features and is activated when M^0 s are above the complexity threshold for the language.

I will show that not merely do extensive neutralizations occur, but also that they tend to occur in the same places within a paradigm in both Australian and Kiowa-Tanoan, clearly unrelated language families. To explain these facts, I develop a theory of complexity for the morphosyntactic representations of multiple-agreement, whereby neutralizations of this sort can be subsumed under the mechanism of Impoverishment as discussed in the Introduction.

3.0.2 Placing

Second, in those multiple argument agreement systems which are not utterly transparent, that is to say, in which there is not an obvious one-to-one correspondence between syntactic agreement projections and affixes, the distribution of affixes is often described in terms of a template whose slots are keyed to the types of features whose exponents will appear in them. For example, consider the following forms from Western Desert (Australian, Dixon 1980: 362), and Dakota (Schwartz 1979):

- (3) a. *pu-ngku-rna-nta* 'I will hit you.'
 hit-FUT-1sgSUB-2sgOBJ
 b. *pu-ngku-mi-n* 'You will hit me.'
 hit-FUT-1sgOBJ-2sgSUB
 (4) a. *ū-ni-kte* 'We killed you (sg).'
 1pl-2PAT-kill
 b. *ū-ya-kte* 'You (sg) killed us.'
 1pl-2AG-kill
 c. *wič^ha-ū-kte* 'We killed them.'
 3pPAT-1pl-kill
 d. *wič^ha-ya-kte* 'You killed them.'
 3pPAT-2AG-kill

In both of the above examples, the affixes which realize 1st person features precede those which realize 2nd person

features, *regardless* of the syntactic source of those features. In both examples, 1st person affixes (either subject or object) precede 2nd person affixes. In Western Desert, the ordering extends to 1 > 2 > 3, but in Dakota, as can be seen in (4c, d), an affix realizing a 3 pl patient precedes both 1 and 2, giving the ordering 3 > 2 > 1. Considerably more complicated and stipulative such templates have been adduced for the Catalan clitics in Bonet (1991). I will refer to this as the Placing Problem.

Some parts of the Placing Problem can be reduced to phonological considerations, but not all. For example, the fact that the 2sgSUB *-n* in Western Desert must follow the 1sgOBJ affix *-ni* in Western Desert is a phonological property of *-n*. This affix is strictly a suffix within the clitic cluster and therefore cannot be the first member of the agreement clitic sequence. The following examples from Warlmanpa, a related language, show that *-n* follows the reflexive affix *-nyanu*, while other agreement markers, both person and number, precede *-nyanu* (Ken Hale, field notes):

- (5) a. = *nna-nyanu*
 1 -refl
 b. = *lu-nyanu*
 pl-refl
 c. = *pala-nyanu*
 dual-refl
 d. = *nyanu-n*
 refl.-2

In Warlpiri, closely related to Warlmanpa, the 2SUB affix has not reduced to *-n*, but remains fully syllabic as *-npa* (Hale 1973). The 2SUB affix does not metathesize to the right of a reflexive or of a 1OBJ clitic:

- (6) a. = *npa-nyanu*
 2SUB-refl.
 b. = *npa-ju*
 2SUB-1OBJ

In the case where metathesis does occur, it is sufficient to assume that the normal Placing order is [subject person > other affixes], but that *-n* must appear as a suffix to the constituent it is adjacent to within the AGR string:

- (7) [-n * [Y X] --> [X+n]

In the above derivation, *-n* trades the relation of left-adjacency to the constituent Y (representing a following object or reflexive affix), for the merger relation, whereby it is suffixed to X. We may speak of this merger as being phonologically motivated, on the assumption that no epenthesis rule or other strategy of repair could allow the single segment /n/ to appear in the string as originally positioned.

The Placement of affixes may therefore depend upon their inherent phonological properties, namely, whether they are inherently suffixes or prefixes. The prefix/suffix *polarity* of an affix is a phonological property of the affix because it is a property relevant to the linearized string phonological information which feeds into PF. Recall that I proposed in chapter 1 that polarity is encoded by means of a feature [+prefix]. I now show that this feature may be underspecified, having its value supplied by the stem to which an affix attaches.

First, affixes may lack suffix/prefix polarity and be placed in virtue of the phonological properties of the stem to which they attach.

Fulmer (1990) has shown that certain verbal affixes in ṢAfar, an East Cushitic language spoken in Ethiopia and Djibouti, attach either as prefixes or suffixes. These affixes are prefixal when the verb begins with a nonlow vowel, elsewhere suffixal:

- (8) a. *t-okm-è* 2-eat-perf 'You ate.'
 b. *yab-t-à* speak-2-impf 'You speak.'
 c. *ab-t-é* do-2-perf 'You did.'

ʕAfar is unusual inasmuch as the phonological properties of the stem and not of the affix determine the Placing of the affix. We may call such affixes *mobile* in the sense that their position is determined for them by other facts about the word in which they appear.

Furthermore, Placing can also be determined by derivational rules. I showed in the Introduction that Huave verbs (and most nouns) require a Theme vowel as part of their autonomous morphological structure. This Theme vowel is usually prefixal, but a certain class of verbs have a suffixal Theme vowel when reflexive (Stairs & Hollenbach 1981). In the following pairs, a transitive verb meaning 'raise' alternates with a derived intransitive meaning 'rise':

- (9) a. *a-wit* TH-raise 'He/she raises (it) up'
 b. *wit-ii-m* raise-TH-nonpast 'He/she rises up'
 c. *t-a-wit* past-TH-raise 'He/she raised (it) up'
 d. *wit-ii-t* raise-TH-past 'He/she rose up'
 e. *ap-m-a-wit* fut.aux-fut-TH-raise 'He/she will raise (it) up'
 f. *ap-wit-ii-m* fut.aux-raise-TH-nonpast 'He/she will rise up'

In the transitive forms, (9a, c, e), the Theme is in its usual prefixal position; when the verbs are intransitive, the Theme is suffixal (9b, d, f). Only derived intransitive reflexives have

the suffixal theme vowel: regular intransitives such as *a-hiy* 'he/she walks,' or *a-kiik* 'he/she laughs' have a prefixal theme. Thus, I postulate a derivational rule of Huave morphology which converts transitives to intransitives as below:

(10) *Huave Detransitivization* (Lexical)

$$\begin{array}{c} \text{[+prefix]} \\ | \\ \text{[[V] TH]} \rightarrow \text{[[V + TH]} \\ | \\ \text{<Ag, Th>} \quad \quad \quad \text{<Ag}_i \text{Th}_i \text{>} \\ \text{[-prefix]} \\ | \\ \text{TH} \end{array}$$

This rule is a derivational rule operating over the autonomous word structures of Huave. As a derivational rule, it is only partly productive: not all verbs permit a derived intransitive via a theme polarity change by this rule.

Mobile affixes of this sort are extremely common in Ket, a Paleosiberian language, which will form the focus of discussion in section 3.4.

Not only is the Theme a mobile affix in Huave, but two other affixes are also mobile and are Placed according to the location of the theme: these affixes are *m* 'nonpast (refl.)/future' and *t* 'past.' Since the theme is always a vowel, and canonical stems begin and end in consonants, it suffices to say that these mobile affixes, like those of ʕAfar, are placed phonologically, according to where the peripheral vowel happens to be. (ʕAfar presents a more complicated picture, since the relevant distinction is between low and nonlow vowels.)

These affixes show overt shifts in its location in (9c, d) for *t* and (9e, f) for *m*. Both must attach to the theme and so are prefixal when the theme is a prefix and suffixal when the theme is a suffix. Not all affixes are mobile in Huave, however. For example, some AGR affixes are invariably suffixes, regardless of the location of the theme:

- (13) a. *ɟa-i-margudba* > [ɟ-i-...]
 1AG-3PAT.classI-hit
 'I am hitting him.'
- b. *(*)ɟa-ɟu-n-anjandi*
 (1AG)-2-ptcl-watch.hypothetical
 '(Suppose) I watch you.'
- c. *ɟa-ni-n-margudba*
 1AG-PL-ptcl-hit
 'You (pl.) hit me.'
- d. *ɟa-ni-(*)ni-n-margudba*
 1AG-PL-(PL)-ptcl-hit
 'You (pl.) hit us.'

In (12b) both the 1SUB prefix and the 2OBJ prefix cannot cooccur, although the 1SUB prefix does appear in (12a), where the 3rd person object has no overt affix. There is in Georgian only one prefix marking agreement, and, where we might expect two prefixes to appear, only one does appear, a prefix indexing the object.

Similarly in Maung, while in (13) the 1AG affix *ɟa-* may appear along with an affix showing the class of the patient (here, *-i-* class I), *ɟa-* cannot cooccur with an affix showing the *person* of the patient, such as *ɟu-* '2.' According to the templatic view, there is only one prefix position for person in the Maung agreement clitic sequence, and, when there is competition for this one slot, an affix discharging patient features will win. Likewise, only one plural affix *-ni-* may appear in any given clitic sequence: where both arguments are plural (participants), only one plural affix may appear, as in (13d).

I will be arguing that these "positions" are not part of autonomous morphological structure, i.e. they are not Qs in Halle's (1990) sense. The crucial assumption is that only obligatory positions may be referred to by morphological rules. Optional "positions" such as occur in Maung or Berber are not

positions but are artifacts of ordering statements holding over the various affixes which an M^0 may split into.

On the traditional view, once a template position is filled, it can no longer accommodate a further string. Thus, besides positioning affixes according to the features they discharge, implicit within the traditional descriptive notation of a template is the *licensing* of these affixes in those positions. In addition to Placing, then, traditional templates perform Licensing. As I will try to show, these are not necessarily related operations, although the template notation leads one to suppose that they are. In fact, I will argue that Licensing and Placing are strictly separate operations.

A major question in the study of systems such as that in Maung is this: are the disjunctions of particular affixes (such as the disjunction of *ɟa-* '1' and *ɟu-* '2' or of more than one instance of *-ni-* 'pl') the result of competition for slots or are they neutralizations of the input morphosyntactic representation? This problem becomes particularly acute if there is no formal way to refer to the slots which these affixes are competing for.

Observe that in the Maung case, both affixes competing for a particular slot realize features of the same *type*. Therefore it is equally plausible to assume that there is no competition among *affixes* per se, but rather that an input representation consisting of too many *features* of like type surpasses the complexity threshold for Maung and therefore must be Impoverished before spell-out takes place.

Some principles must determine which features will win out in such a competition: in the Maung case will it be the '1' of the subject or the '2' of the object? A natural assumption to make is that the principles which govern direction of Impoverishment are the same as those which order morphological rules, as proposed in chapter 1. Specifically, object features will win out over subject features on the assumption that objects are more marked than subjects (in a nominative-accusative system).

Recall from the Introduction that I proposed that Impoverishments are effected by filters in Universal Grammar. Essentially, a child will assume that a filter is operative until forced to suppress the filter by positive evidence. Therefore, languages which permit extensive exponence of multiple

agreement properties (e.g. Warlpiri) are highly marked, since the automatic neutralization filters operative in Maung, for example, are suppressed. This leads automatically to the prediction that, other things being equal, whenever an agreement system arises which is very rich in the overt exponence of two or more arguments (e.g. Warlpiri), this system should yield diachronically to more compact and less "expressive" agreement morphology as in Maung.

3.1.1 Strict and Free Licensing

We have seen that the traditional template notation implicitly licenses affixes in certain positions. Since I deny that this traditional notation is anything more than epiphenomenal, I now describe the sources of licensing as I understand them.

Licensing of affixes comes from three sources. The first source is that each M^0 from syntax licenses an affix position: an obligatory Q. This sort of system is exemplified whenever there is a simple isomorphy between M^0 's and affixes.

The second licensing source is that autonomous word-structure may require more than one position, as in Arabic, in which case the M^0 splits, filling the independently required positions. In both these cases, an affix may appear only when independently licensed, either by an M^0 from syntax, or by obligatory positions (Qs) which this M^0 must split into for morphological well-formedness. I will call such systems Strict Licensing systems.

The third case, exemplified by Berber and all languages with "optional" templatic positions, I will call Free Licensing systems, in which each M^0 splits into indefinitely many affixes and no explicit licensing conditions are required for each such affix. In section 1.18 I proposed a parameter, represented formally as a feature [\pm Autonomous Licensing], which differentiates M^0 's such as the Berber AGR and the Arabic INFL. Berber AGR is [-Autonomous Licensing] — a Free Licensing system — in which no position is obligatory and as many affixes appear as there are features which can be discharged. Arabic INFL is [+Autonomous Licensing], and each affix may appear only if the word-template is not filled up.

The only real *positional* disjunctivity occurs in [+Autonomous Licensing] systems. Here, a word becomes "filled-up": the word has only so many positions of exponence permitted by its autonomous conditions of well-formedness, and once these are filled, no more affixes may be added to it, regardless of the types of features the affixes express. Recall from Chapter 1 that in classical Arabic the suffix position shows positional disjunctivity: the default tense/mood suffixes $-u \sim -\emptyset \sim -a$ appear only when a more specific agreement affix does not fill the suffixal slot.

Because Arabic INFL is [+Autonomous Licensing], then positions are obligatory. It follows that for each position there must exist an explicit default realization: $y-$ for the prefix position and $-u \sim -\emptyset \sim -a$ for the suffix position, depending upon the tense and mood features on the stem. Default affixes in obligatory positions are diagnostic of [+Autonomous Licensing] systems.

In Free Licensing on the other hand, affixes are self-licensing, although their location (their Placing) may be stipulated or automatic, depending upon other factors (discussed in section 3.1.2). I proposed in the last section that apparent disjunctivity of affixes within *non-obligatory* positions results in all cases from Impoverishment and not from "competition" for slots.

As an example of a Free Licensing system, consider again the Berber conjugation as analyzed in section 1.18. (Although the Berber paradigm below is not a multiple-argument agreement system, it displays Free Licensing.) Berber also presents the case where an M^0 may split indefinitely, and hence there are no explicit licensing conditions. The conjugation for the Tamazight dialect is repeated below:

(14) Tamazight Berber Prefix Conjugation. *dawa* 'cure'

	singular	plural
3m	<i>i-dawa</i>	<i>dawa-n</i>
3f	<i>t-dawa</i>	<i>dawa-n-t</i>
2m	<i>t-dawa-d</i>	<i>t-dawa-m</i>
2f	id.	<i>t-dawa-n-t</i>
1	<i>dawa-y</i>	<i>n-dawa</i>

Tamazight Berber verbs may have up to three affixes, as in *t-dawa-n-t* '2-cure-pl-f: you (f pl) cure.' But no single one of these affix positions is obligatory (in the sense that each position need not have an overt filler): verbs may have no prefix and only one suffix, as in *dawa-y* 'cure-1: I cure' or a prefix and no suffix: *i-dawa* 'sg.m-cure: he cures.' Because Berber AGR is [-Autonomous Licensing], no position-of-exponence is obligatory. This means, in effect, that if Berber AGR were *not* "liberated" in this way, it would require three independently licensed positions, each with a \emptyset elsewhere affix. Such zeroes, however, are unmotivated and have no content. Therefore, Berber AGR is liberated and splits as much as it can.

In a Free Licensing system, there are as many positions of exponence as there are rules which discharge features as affixes. Each affix licenses its own position, and there is therefore never any competition for slots.

For example, consider the Berber form *dawa-n-t* 'cure-pl-f: they (f) cure.' Because the plural affix *-n* is *not* disjunctive with the feminine affix *-t*, we may say that both affixes are licensed. But this licensing is *not* because there are two suffix positions-of-exponence in Berber, in the sense of positions-of-exponence as *obligatory* elements of autonomous word-structure (as in Arabic). Rather, Berber has no explicit licensing conditions at all: each affix licenses itself. Because there are no slots for which affixes are in competition in a Free Licensing system, there can be no *position-based* disjunction among affixes, although, as I showed in section 1.18, discontinuous bleeding continues to apply, such that features are discharged only once. Spell-out rules thus continue to apply until as many of the features of the input are discharged as can be.

In Maung as well, prefix positions are not obligatory. In Maung, if there is no 1st or 2nd person argument, the person prefix positions may be empty (15a); if no participant is plural, then the position for the affix *-ni-* may also be empty (15b):

- (15) a. \emptyset - \emptyset -*ji-wu-ɲa-rundin*
 3classI-3classIII.ERG-cook in hole.PAST
 'They roasted it.'
- b. *gu- \emptyset -n- \emptyset -ɲa-walgu-ɲ*
 2-ptcl-3classII.ERG-promise-PAST
 'She promised you.'

In such cases, the "positions" do not contain contentful \emptyset s. These empty \emptyset s represent only places in the string where other affixes *would have* appeared if the AGR had different features.

In Maung, one prefix "position" is specifically *keyed* to person features and one to the feature [-sg]: only affixes which are primary exponents of (at least one) of these features may appear in these positions. On the other hand, the Arabic suffix position is neutral with respect to the type of features which may appear in it: it does not matter, as long as the position is eventually filled. In Berber, finally, "positions" are neither keyed nor obligatory.

Therefore, we could write a template for Maung, for example, that has an optional Person-Prefix slot and an optional Number-Prefix slot and two optional Class prefix slots. For Berber, we could write a "template" with three obligatory slots. For Arabic, on the other hand, there is an obligatory, unlabelled prefix and suffix slot:

- (16) Maung: (QPerson) (QNumber) (QClass) (QClass) Verb
 Berber: (Q) Verb (Q) (Q)
 Arabic: Q Verb Q

I proposed in chapter 1 that the Arabic system is derived by conditions on the well-formedness of words, and that these conditions are encoded in an autonomous module of grammar

figuring in the mapping from syntax to phonology. This is one way of defining a template: a mold which must be *filled up* in order to give a well-formed object.

The Maung and Berber cases are different: since the Qs are not obligatory, it makes no sense to say that the *positions* are required for morphological well-formedness. The notational function of the Maung “template” is merely to order the affixes appropriately and to ensure that there is only one affix of each type. This represents another conception of a template: a mold which enforces a particular form on an object.

I propose that these ordering facts are to be accounted for by separate principles of Placing which I discuss in the next section; I have already suggested that Improverishment ensures that only one affix of each type appears in the Maung prefix string. Therefore, the template has no independent function but is a theoretical artifact in a Free Licensing system.

To summarize, I now present the following hypothesis:

(17) M^0 s have the feature [\pm Autonomous Licensing].

- a. If $M^0 = [+Autonomous Licensing]$, then affixes discharging features in M^0 appear only in obligatory positions (Qs) appearing in autonomous morphological structure. Each Q may be realized as only one affix; therefore there may be positional disjunctivity.
- b. If $M^0 = [-Autonomous Licensing]$, M^0 may split into as many affixes as there are relevant rules to discharge the features of the M^0 . Apparent positional disjunctivity arises solely from Improverishment.

The differences between Maung, Arabic, and Berber are now shown according to the characteristics below:

(18) [\pm Aut. Lic.] Placing Qs & neutralization of default affixes like features

Arabic	+	-	+	-
Maung	-	+	-	+
Berber	-	-	-	-

(19) [+Aut. Lic.] \rightarrow obligatory positions, default affixes, competition for slots

[-Aut. Lic.] \rightarrow unlimited splitting, optional “positions”

Turning now again to the examples in section 3.0, it is now apparent that Western Desert and Dakota, like Berber, are Free Licensing systems (at least with regard to verbal agreement). In both Dakota and Western Desert, there is no competition for slots and no position is obligatory.

In terms of acquisition, the Strict Licensing system is discoverable whenever there exist non-zero elsewhere rules, that is, affixes whose content is not a natural class. Strict Licensing is also discoverable when there is competition for *obligatory* slots among independently occurring affixes, such as the Arabic person-number-gender endings *-na*, *-aani*, *-iina*, *-iuna* disjunctive with the imperfect ending *-u*. Free Licensing is discoverable whenever there is manifest splitting of M^0 s into non-obligatory positions, as in Berber or Maung.

To know Arabic, one must know that each nonperfect verb has at most and at least one prefix and suffix. This fact must be learned as part of the autonomous morphological structure of a certain type of Arabic INFL.

To know Berber, one must know that the AGR M^0 splits variously and indefinitely, and that the expected one-to-one relationship between M^0 s and affixes is waived. This too must be learned as the [-Autonomous Licensing] parameter of Berber AGR. Beyond this parameter, one need know for Berber only the verbal agreement affixes and the rule hierarchy which dictates their order of attachment and relative rank.

To know Maung, one must know that the AGR M^0 splits into a number of non-obligatory positions and is therefore also [-Autonomous Licensing]. Additionally, however, one must

know both the principles which correctly place affixes and the impoverishments which prevent more than one person or number affix from being generated.¹ We now turn to the mechanisms of Placing.

3.1.2 Strict or Free Placing

Placing may also be Free or Strict. With Free Placing, affixes attach in the order predicted by the hierarchy of features which governs morphological rule ordering. With Strict Placing, language-particular stipulations govern the positions of affixes.

In chapter 1, I showed that Arabic is a Free Placing system, but within a Strict Licensing system for positions of exponence. There are only two positions of exponence for the prefix-conjugation: the prefix and the suffix. The prefix/suffix polarity of each affix dictates its position in the string. There is no need for specific rules of Placing. Insofar as the rules of Placing would have to mirror the prefix/suffix information in each affix, there would be a considerable duplication if separate placing rules were to position these affixes' features and then to realize them as strings.

Next, consider again the Berber form *t-dawa-n-t* '2-cure-pl-f: they (f) cure.' The two suffixes appear in the order *pl > f*, just as is predicted by the hierarchy. The rule discharging 'pl' applies first and places the suffix at the right edge of the stem. The rule discharging 'f' then applies placing *-t* to the right edge of this already suffixed form:

(20) Rule	Representation	Morphological Word
Input	[[V] 2 pl.f]	
2 <i>t</i>	[[[V] pl.f]	<i>t -V</i>
pl -n	[[[V]f]	<i>t -V-n</i>
f -t	[[[V]]]	<i>t -V-n-t</i>

What is crucially the case is that the Placing and the spelling-out/discharge of features happen *simultaneously*. All Placing in a Free Placing system can be derived automatically

from the order of the rules and the suffix/prefix polarity of the affixes.

Thus, in a Free Placing and Free Licensing system, the derivation resembles most closely the Extended Word and Paradigm model of Anderson (1981) and subsequent work. The difference between that model and the theory advanced here is that the rules in (20) actually discharge features of the input, so as to allow bleeding without rule block disjunctivity (recall section 1.18.3).

The hierarchy of features determines the ordering of affixes in a Free Placing system. Therefore, we should expect that there is some correlation between the level of embedding of affixes in a Free Placing/Free Licensing system (such as Berber) and the "winner" affixes when affixes compete for positions in a Strict Licensing system such as Arabic. This can be diagrammed as below:

(21) a.	...p]n]g]	Free Placing/Free Licensing
b.	x 'p'	Strict Licensing
	y 'n'	
	z 'g'	

In a Free Placing/Free Licensing system, affixes realizing person (p), number (n), and gender (g) should have the (unmarked) level of embedding as in (21a), since the person affix will attach first, and then the number affix, etc. If all three affixes are competing for the same slot in a Strict Licensing system, the 'p' affix should win, since the rule realizing this affix will apply first. Thus, the Feature Hierarchy Hypothesis can now be amended:

(22) *The Feature Hierarchy Hypothesis.*

There is a universal hierarchy of morphosyntactic features. If F and G are morphosyntactic features and F is higher than G on the hierarchy, then:

- (1) If $[\alpha F \beta G]$ is active at Morphology, then $[\alpha F \beta G]$ is impoverished to $[\alpha F]$
- (2) If two spell-out rules, one referring to F, the other to G and not to F, have disjoint or overlapping structural descriptions, then the rule referring to F applies first.

Corollary of (2): in a Free Licensing/Free Placing system, an affix realizing F will appear more embedded than an affix realizing G but not F.

The corollary above has an interesting parallel in the observation of Bybee (1985:13):

- (23) These results [i.e. of a study of morpheme ordering, R.N.] suggest a "diagrammatic" relation between meanings and their expression, such that the "closer" (more relevant) the meaning of the inflectional morpheme is to the meaning of the verb, the closer its expression unit will occur to the verb stem. This type of diagrammatic relation is also evident in the degree of fusion between the expression of the verb stem and the inflectional morphemes. . .

For Bybee's conception of "relevance" I am substituting the notion of feature hierarchy. In general, the higher on the hierarchy the features are which an affix realizes, the closer to the stem (including fusing with the stem) it will occur in the unmarked case, i.e. a Free Placing system. The Feature Hierarchy Hypothesis is more predictive than Bybee's observation because it correlates neutralization, affix order, and the "winners" in competition for strictly licensed slots.

Strict Placing, on the other hand, occurs when specific ordering statements (traditionally notated by means of templates) situate affixes in a string. An example of Strict Placing can be found in the positioning of clitics in Catalan. Bonet (1991:103) proposes the template in (24) for the Barceloní dialect of Catalan. Mapping to this template linearizes clitics according to their feature content. Position 1 is occupied by the reflexive (no marked person features), position 2 by the 2nd person, position 3 by the first person, position 4 by 3rd person (unmarked), position 5 by the genitive (partitive) and position 6 by the neuter or oblique. Sentence (25) shows all positions with an overt clitic:

- (24)
- | | | | | | |
|--------|--------|--------|--------|--------|--------|
| CL | CL | CL | [ARG] | [GEN] | [OBL] |
| | | | | | |
| ARG | ARG | ARG | ARG | ARG | [NEUT] |
| [PERS] | [PERS] | [PERS] | [PERS] | [PERS] | [NEUT] |
| | | | | | |
| | [-1] | | | | |
| | | | | | |
| | | | | | |

- (25) [sə tə mə lʒə n i] *was* *quedar tres*
 refl-2-1-3pl-gen-obl aux-2sg take three
 'You took three of them from mine (e.g. children).'

The ordering of the clitics in (24) is largely stipulative. Bonet considers but rejects syntactic solutions to the placing problem. A decisive argument showing how stipulative the ordering of clitics is in Catalan comes from Bonet's examination of dialectal variation:

While in Barceloní the order between first and second person, and the bare [PERSON] clitic *es* is as ... for Standard Catalan (*es-II-I*), the order in Gironí, just a few miles to the north) is *II-I-es*. In addition, in dialects very close to Barceloní ... the order is *II-es-I*. Nothing in the syntax of these dialects (identical as far as I know) could account for this difference (Bonet 1991:75).

To Bonet's assertion that syntactic variation cannot account for this difference in clitic ordering we may add as well that the hierarchy of features cannot be adjusted to predict all three different orderings *II-I-es*, *II-es-I* and *es-II-I*. At least two of them must be stipulated orderings, if not all three.

How shall such stipulated orderings be effected? We can construct two hypotheses regarding how Strict Placing occurs. These will be called the Representational view and the Derivational view. Bonet's template for Catalan exemplifies the Representational view. Speakers of Barceloní will "know" the representation in (24) and the principles which dictate how morphosyntactically represented clitics link to this template. Thus, in virtue of knowing the representation of the template and clitics, the placing of the clitics is derived by mapping principles.

On the Derivational view, the templatic representation in (24) is epiphenomenal. Instead of knowing the representation of the template, speakers instead know a set of ordering relations among the different clitics (or, equivalently, among the rules which realize the clitics). For example, the template in (24) can be generated from principles of ordering, which will include statements like "an [ARG] clitic will precede any non-[ARG] clitic; any [PERSON] clitic will precede any non-[PERSON] clitic, etc." The Catalan case is particularly specialized, so that the number of discrete statements required to uniquely generate this template is large. However, this is an advantage of the analysis, since the Catalan case is quite exceptional.

A further advantage of the Derivational view of template "construction" is that certain of the discrete statements

involved in generating a template can be evaluated as less or more costly than others. For example, the Maung template can be derived according to the statements: person > number, number > class, as is not atypical for Australian clitic clusters; similarly the Dakota template is derivable from the statement $1 > 2$. These discrete ordering statements are unmarked (and therefore costless) options of Universal Grammar; other discrete ordering statements, such as perhaps the $2 > 1$ ordering of Barceloní Catalan, as opposed to the $1 > 2$ ordering in Valencian (Bonet 1991:131), are marked and therefore costly. Any given template will combine marked and unmarked options among its discrete ordering statements. Furthermore, if templates are generated by sets of discrete ordering statements, then acquisition and historical change will add or modify these statements individually to a grammar.

On the Representational view, there is no obvious way to decompose a template and therefore to evaluate its cost or describe its historical or psychological development.

Free Placing can also be understood within a Representational or Derivational View. On the Representational view, Free Placing systems merely have no templates: they are "auto-templatic." On the Derivational view, Free Placing entails, in effect, that each affix automatically creates its own discrete placing statement. For example, the Berber rule/suffix *-n* 'pl', in virtue of its being a *suffix*, automatically generates a placing statement which places the feature 'pl' to the right of the existing form and then discharges this feature and spells it as *n*. What is special about these automatically generated placing statements is that they situate the affix only *vis-à-vis* the pre-existent stem and not *vis-à-vis* any other *particular* affix. Thus, Free Placing is derived only from the suffix/prefix polarity of an affix and not in virtue of any other ordering statement. So we can call Free Placing systems "auto-regulatory" as well.

The order of the rules introducing affixes is the same as the sequential order these affixes come to have in a template (or the level of embedding in systems with prefixes and suffixes). Therefore, language-particular discrete ordering statements such as Catalan $2 > 1$ are in fact extrinsic ordering statements (costly, learned) for the rules which introduce the 2 affix /t/

and the 1 affix /m/. On this view, which I now adopt, "templates" arise from the order in which morphological rules apply; this order may be entirely unmarked, obeying the hierarchy of features, in which case we have a Free Placing system, or it may have extrinsic and stipulative ordering, in which case we speak of Strict Placing.

To summarize, the ordering of clitics in Catalan represents a system of Strict Placing, whereas, insofar as the order of affixes obeys only the hierarchy of features, the Berber system represents Free Placing, and, insofar as the prefix/suffix polarity of the affixes determines their location, the Arabic system represents Free Placing as well.

One very desirable result of the Derivational view of template construction is that it allows the decomposition of a template into the discrete ordering statements that generate it. This then allows the ordering statements to have different sources: stipulative, phonological, or syntactic. In the previous section, I reviewed the phonological motivations for affix Placement in Afar, Western Desert, Warlmanpa, and Huaue. We now return to the Dakota ordering $3 > 2 > 1$ introduced earlier and see that this ordering derives from the interaction of two discrete statements of differing source.

Schwartz (1979) identifies two competing analyses for the observed orderings in Dakota, which are summarized in the table below, taken from Schwartz (1979:8):

(26)	3rd person >	1st person >	2nd person	
a.	wič'a	wa		1: 3pl
b.	wič'a	ũk		1pl : 3pl
c.	wič'a		ya	2: 3pl
d.		ma	ya	2: 1
e.		ũk	ya	2: 1pl
f.		ũk	ni	1pl : 2

On the first analysis, the positions of affixes is determined by the ordering relation $3 > 1 > 2$. Thus, $3 > 2$ in (26c), $3 > 1$ in (26a,b), and $1 > 2$ in (26d,e,f). However, because the only 3rd person clitic that exists in the transitive agreement systems is the 3pl *patient* clitic *wič'a*, it is also the case that, with only

one exception, patient clitics precede agents clitics. The one exception is when the agent is 1st person and the patient is 2nd person (26f). Rather than state the ordering generalization as "patients precede agents" and include an exception statement, Schwartz argues that the affixes are positioned according to $3 > 1 > 2$, which she takes ultimately to be a condition on the individual affixes.

However, there is another factor at play here: observe that the 1pl affix *ũk* is used when indexing *either* the patient or agent. It is therefore unmarked with regard to its syntactic source. Thus, the ordering in (26f) is not in fact at variance with the principle that patient affixes precede agent affixes, whenever these affixes specifically index the patient or the agent. This observation allows the following straightforward account of the Dakota ordering to emerge.

I proposed at the beginning of the section that, in the least costly instance, the order of application of morphological rules is a function of the hierarchy of features. Some hierarchy, whether marked or unmarked, will by hypothesis derive the ordering in Dakota. Two ordering principles derive the correct results:

- (27) a. patient > agent
 b. [+I] > [+you]

The independence of these two principles can be observed in "double-patient" constructions of Lakhota, where neither argument of a transitive clause "performs/effects/instigates or controls" the action (Mithun 1991:517). In the examples below, taken from (Mithun 1991), the 2nd person patient *ni* and 1st person patient *ma* cooccur in that order. Under such circumstances, principle (27a) cannot order the clitics at all and (27b) is reversed:

- (28) a. *iyé-ni-ma-č'eča* 'I look like you'
 b. *í-ni-ma-skokeča* 'I am as large as you'
 c. *iyó-ni-ma-kip'į* 'I find you congenial'

Separating the two principles then allows them to be evaluated individually in terms of cost. As for (27a), we return

to the matter of agent/patient marking in chapter 4. Considering for now only (27b), this ordering is either costless (if the clitic cluster is spelled left-to-right as a separate M^0) or costly (in the clitics are added form right-to-left as affixes to the verb). A more thorough investigation of the morphology of Dakota would be necessary to determine which scenario is correct. However, what is clear is that the Dakota "template" $3 > 1 > 2$ is an epiphenomenon arising from the interaction of the two principles in (26). I will show in section 3.2.3 that the same sort of interaction among Placing principles occurs in Nunggubuyu and motivates in large part the extensive neutralizations seen in its agreement sequences.

Schwartz's conclusion that the individual affixes (their form rather than function) determine their placement is partly correct. It is the featural content of each affix which determines its placement, regardless of its *de facto* function in the system. In particular, the feature content of $\bar{u}k$ is merely '1 pI' without patient or agent function. Therefore this affix may precede a patient affix as in (26f), although it discharges features associated with the agent. On the theory adopted here this is not surprising: the rules which discharge features as affixes refer to as few features as necessary to determine the proper realization of an affix.

To summarize, the following parameters classify the systems so far observed:

(29) *Typology of M^0 Splitting Systems.*

	neutralization of like features	autonomous obligatory positions	costly discrete ordering statements
Berber	-	-	-
Arabic	-	+	-
Maung	+	-	-
Dakota 2	+	-	?
Catalan	+	-	+

We have already observed systems of the first two types — Arabic and Berber — and the last type, Catalan, as exemplified extensively in Bonet (1991). The remainder of the

chapter addresses those systems like Maung and Dakota that fall in the gray zone, where there is neutralization of like features, and/or affixes are positioned by unmarked principles of hierarchy or by marked discrete ordering statements, or a combination of such principles. The first such system to be discussed is Nunggubuyu.