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ON RULES OF REFERRAL

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Zwicky (1985) has argued that an adequate realizational theory of morphology must incorporate RULES OF REFERRAL in order to account for some kinds of inflectional syncretism. In this paper I propose a formal theory of rules of referral within the broader framework of PARADIGM FUNCTION MORPHOLOGY. This theory affords a precise account of a range of rule interactions involving rules of referral; in addition, it furnishes a simple explanation for the fact that syncretisms don't always encompass whole words, for the fact that some referrals are bidirectional, and for the fact that two or more referrals may participate successively or simultaneously in the definition of a single instance of syncretism.*

1. INTRODUCTION. The past twenty years have seen an abundance of research demonstrating the necessity of assuming a REALIZATIONAL approach to inflection (Matthews 1972, Anderson 1977, 1982, Zwicky 1985, and others). In this sort of approach, an inflected word's association with its morphosyntactic feature specifications is logically prior to the spelling out of its inflectional markings, since it is this very association that determines the sequence of operations by which those markings are introduced; the realizational approach thus entails a rejection of the assumption that a word's morphosyntactic feature content is built up cumulatively from that of its inflectional 'morphemes' by a percolation mechanism (Lieber 1980, 1992, Selkirk 1982, and others).[1]

Zwicky (1985:372) argues that an adequate realizational theory of inflection must incorporate two different kinds of realization rules:

> 'First there are rules of EXPONENCE, describing how certain combinations of morphosyntactic features are realized, in the context of certain other bundles, as morphophonological operations. The following principle of English is a typical rule of exponence: In the context of [CAT:verb], [VFORM:past] is realized by the suffixation of /d/. Then there are rules of REFERRAL, stipulating that certain combinations of features have the same realization as certain others. The following principle of English is a typical rule of referral: In the context of [CAT:verb], [VFORM:pastprt] has the same realization as [VFORM:past].
>
> All realization rules are treated as expressing DEFAULTS, which are automatically overridden by more specific rules (and these in turn by still more specific rules, and so on).'

In subsequent work, Zwicky (1990, 1991) has re-emphasized the need to countenance both sorts of rules, but the attention of realizational morphologists has, up to now, tended to focus virtually exclusively on the properties and interactions of rules of exponence. Nevertheless, recent work on the nature of syncretism in inflectional paradigms (e.g. Carstairs 1984, 1987:Ch.4) reveals the major role that rules of referral must play in languages with inflectional morphology. Many urgent questions concerning the properties of such rules therefore remain to be addressed.

My purpose here is to develop a formal theory of rules of referral within the

* I wish to thank two anonymous referees for their comments.

[1] See Stump 1993b for arguments against the view that morphological structures are regulated by a universal, structure-based percolation mechanism.

context of Paradigm Function Morphology, a realizational theory that I have proposed and argued for in various places (Stump 1991, 1992, 1993a). I begin in §2 with an informal discussion of some basic properties of rules of referral—the kinds of generalizations that they are suited for capturing, the ways in which they interact with each other and with rules of exponence. In §3 I propose a formal theory of rules of referral and show how it accounts for the basic properties discussed in §2. Sections 4–6 address additional specific questions about the nature of rules of referral and show how these questions are resolved in the proposed theory: the question of whether rules of referral have whole words as their compass or instead merely encompass the individual steps by which an inflected word is built up from the root of its paradigm (I argue for the latter view in §4); the criteria for determining the direction of referrals, including an account of instances of bidirectional referral (§5); and a demonstration that both cases of syncretism involving the successive application of two or more rules of referral and cases apparently involving the simultaneous application of two or more such rules are straightforwardly accommodated by the proposed theory (§6). My conclusions are summarized in §7.

2. SOME FUNDAMENTAL PROPERTIES OF RULES OF REFERRAL. In this section I elucidate some of Zwicky's basic assumptions about rules of referral. The evidence discussed here is central to the exposition of the theory proposed in §3.

2.1. RULES OF REFERRAL VS. RULES OF EXPONENCE. On first consideration, one might suppose that rules of referral are suitable for capturing all generalizations pertaining to syncretism. Following Zwicky 1985, however, I assume that rules of exponence are actually better suited for capturing some such generalizations—i.e. that rules of referral are appropriate for describing only certain types of syncretism.[2] As a concrete basis for discussion, consider first the Welsh Romany verbal paradigm in Table 1. Two instances of syncretism

	PRESENT	IMPERFECT	PRETERITE
1sg	*kamáva*	*kamávas*	*kamdóm*
2sg	*kamésa*	*kamésas*	*kamdán*
3sg	*kaméla*	*kamélas*	*kamdás*
1pl	*kamása*	*kamásas*	*kamdám*
2pl	*kaména*	*kaménas*	*kamdán*
3pl	*kaména*	*kaménas*	*kamdé*

TABLE 1. Indicative forms of the Welsh Romany verb *kam-* 'to love' (Sampson 1926:188ff.).

are evident in this paradigm: in the present and imperfect, the second person plural (2pl) and third person plural (3pl) forms are identical; and in the preterite the second person singular (2sg) and 2pl forms are identical. In order to capture these generalizations (which are valid for all classes of verbs in the language), one might propose the following pair of rules of referral:

[2] 'Syncretism' here refers to any instance of what Carstairs (1987:91) calls 'systematic inflectional homonymy' and therefore includes both the narrower sense of syncretism which he adopts (115) and his concept of take-over (117).

(1) a. In the present and imperfect, the second person plural has the same form as the third person plural.
b. In the preterite, the second person plural has the same form as the second person singular.

On this analysis, there wouldn't be any rules of exponence for 2pl verb forms. The existence of 2pl PRES *kaména* and 2pl IMPF *kaménas* would—by 1a—simply follow from the rule suffixing *-éna* in 3pl present and imperfect forms and the rule suffixing *-s* in imperfect forms. Similarly, the existence of 2pl PRET *kamdán* would—by 1b—simply follow from the rule suffixing *-d* in preterite forms and the rule suffixing *-án* in 2sg preterite forms.

This analysis gets the facts right. There is, however, a more economical way of capturing these same facts—one which doesn't make use of rules of referral. Consider first the second-person preterite syncretism. Instead of assuming that the rule of *-án* suffixation realizes the specification 'second person singular preterite', one can instead assume that it realizes the specification 'second person preterite'; besides simplifying the rule of *-án* suffixation, this move makes it possible to eliminate 1b altogether.

A similar simplification isn't obviously possible for the syncretism of the 2pl and 3pl in the present and imperfect: although the 2sg and the 2pl constitute the coherent class 'second person' in Welsh Romany, the 2pl and the 3pl do not obviously form a coherent class. One might postulate a feature [±1ST PERSON] such that the 2pl and the 3pl would constitute the coherent class '[−1ST PERSON], plural', but without any independent motivation for this feature,[3] this would be a questionable analysis. There is, however, another possibility. One could postulate a rule of *-éna* suffixation applying by default in all plural forms in the present and the imperfect; as a default, this rule could (in accordance with the Elsewhere Condition) be overridden by the rule of *-ása* suffixation applying in 1pl present and imperfect forms, but would remain applicable in the absence of any such overriding rule. On this analysis, the rule of referral in 1a could likewise be eliminated.[4]

The conclusion to be drawn from these facts is that certain instances of syncretism are best accounted for by rules of exponence rather than rules of referral. In particular, when the members of a set of syncretized forms constitute a coherent morphosyntactic class (e.g. that of second-person preterite forms), one needn't resort to rules of referral to account for their syncretism. And even when the members of a set of syncretized forms don't constitute a coherent class, one needn't necessarily postulate any rule of referral if their syncretism can be viewed as the effect of a rule of exponence whose default application to some coherent class is in some cases overridden.

[3] Universal grammar cannot be plausibly assumed to supply a set of binary person features; cf. Zwicky 1977.

[4] For expository simplicity, I have treated *-ása* and *-éna* as being morphologically unanalyzable; they might, however, be viewed as consisting of a stem-forming suffix (*-á* in the first person, *-é* elsewhere) followed by a personal termination (*-sa, -na*); cf. Sampson (1926:187). The argument developed here holds regardless of which analysis is assumed.

Granted these considerations, however, there are still circumstances in which rules of referral are plainly called for. To see this, consider the Macedonian verbal paradigms in Table 2. (Note that the inflectional suffixes in these paradigms fall into three position classes, each associated with a different 'slot' in the sequence of verbal inflections. In Table 2 these three slots are labelled 'I', 'II', and 'III', and suffixes are aligned according to the slot they occupy.)

	PRESENT			IMPERFECT				AORIST			
	I		III	I	II		III	I	II		III
A. *padn-* 'fall':											
1sg	*padn*		*-am*	*padn*	*-e*	*-v*		*padn*	*-a*	*-v*	
2sg	*padn*	*-e*	*-š*	*padn*	*-e*		*-še*	*padn*	*-a*		
3sg	*padn*	*-e*		*padn*	*-e*		*-še*	*padn*	*-a*		
1pl	*padn*	*-e*	*-me*	*padn*	*-e*	*-v*	*-me*	*padn*	*-a*	*-v*	*-me*
2pl	*padn*	*-e*	*-te*	*padn*	*-e*	*-v*	*-te*	*padn*	*-a*	*-v*	*-te*
3pl	*padn*		*-at*	*padn*	*-e*		*-a*	*padn*	*-a*		*-a*
B. *nos-* 'carry':											
1sg	*nos*		*-am*	*nos*	*-e*	*-v*		*iznos*	*-i*	*-v*	
2sg	*nos*	*-i*	*-š*	*nos*	*-e*		*-še*	*iznos*	*-i*		
3sg	*nos*	*-i*		*nos*	*-e*		*-še*	*iznos*	*-i*		
1pl	*nos*	*-i*	*-me*	*nos*	*-e*	*-v*	*-me*	*iznos*	*-i*	*-v*	*-me*
2pl	*nos*	*-i*	*-te*	*nos*	*-e*	*-v*	*-te*	*iznos*	*-i*	*-v*	*-te*
3pl	*nos*		*-at*	*nos*	*-e*		*-a*	*iznos*	*-i*		*-a*
C. *id-* 'go':											
1sg	*id*		*-am*	*id*	*-e*	*-v*		*id*	*-o*	*-v*	
2sg	*id*	*-e*	*-š*	*id*	*-e*		*-še*	*id*	*-e*		
3sg	*id*	*-e*		*id*	*-e*		*-še*	*id*	*-e*		
1pl	*id*	*-e*	*-me*	*id*	*-e*	*-v*	*-me*	*id*	*-o*	*-v*	*-me*
2pl	*id*	*-e*	*-te*	*id*	*-e*	*-v*	*-te*	*id*	*-o*	*-v*	*-te*
3pl	*id*		*-at*	*id*	*-e*		*-a*	*id*	*-o*		*-a*

TABLE 2. Finite forms of some Macedonian verbs (Lunt 1952:72ff).

One instance of syncretism is particularly salient in these paradigms: in the past tenses[5] (i.e. the imperfect and the aorist) the 2sg and 3sg are identical. This is an instance in which it is most economical to postulate a rule of referral:

(2) In the past tenses, the second person singular has the same form as the third person singular.

If 2 is assumed, the imperfect and aorist forms in Table 2 can be accounted for by means of the rules of exponence in 3 (leaving aside, for the moment, any account of the stem-forming suffixes occupying slot I).[6] In the formation of 1pl IMPF *padnevme* 'we fell', two of the rules in 3 apply—rule 3a, *-v* suffixation, and rule 3b.ii, *-me* suffixation. In the formation of 3sg IMPF *padneše* 's/he fell', however, only one rule in 3 applies—rule 3b.i, *-še* suffixation—and

[5] For details on the semantic differences between the imperfect and the aorist, see Lunt (1952: 87ff).

[6] I follow Zwicky (1985:377) in assuming that an empty affix position is ordinarily the result of the nonapplication of any rule of exponence filling that position; but, like him, I do not exclude the possibility that a rule of exponence might explicitly require a particular affix position to remain empty, e.g. if zero exponence overrides a default rule of affixation (cf. Stump 1992:216, 228ff.).

in the formation of 3sg AOR *padna* 's/he fell' none of the rules in 3 applies. By the rule of referral in 2, *padneše* and *padna* become the 2sg forms for the imperfect and aorist tenses, respectively.

(3) a. Rule of exponence for slot II: The specification 'past tense' is realized by the suffixation of *-v* in the nonthird persons.
b. Rules of exponence for slot III:
i. The specification 'third person singular imperfect' is realized by the suffixation of *-še*.
ii. The specification 'first person plural' is realized by the suffixation of *-me*.
iii. The specification 'second person plural' is realized by the suffixation of *-te*.
iv. The specification 'third person plural past' is realized by the suffixation of *-a*.

This instance of syncretism is different from that of second-person preterites in Welsh Romany, because the 2sg and 3sg do not obviously constitute a coherent morphosyntactic class. Moreover, this case differs from that of the 2pl and 3pl in the Welsh Romany present and imperfect. In Welsh Romany the syncretism of the 2pl and 3pl could be most economically viewed as the effect of a default rule of *-éna* suffixation overridden in 1pl forms; but an analogous account of the 2sg/3sg syncretism in Table 2 would miss a generalization. Consider the possibility of dispensing with the rule of referral in 2 by assuming that 3a is overridden by 4a and by replacing rule 3b.i with the pair of rules in 4b:

(4) a. Additional rule of exponence for slot II: The specification 'second person singular past tense' has zero exponence. [Overrides 3a.]
b. Rules of exponence for slot III (replacing 3b.i):
i. The specification 'singular imperfect' is realized by the suffixation of *-še*.
ii. The specification 'first person singular imperfect' has zero exponence. [Overrides 4b.i.]

With this revised set of rules of exponence, 2sg past-tense forms are generated independently of their 3sg counterparts; 4a and 4b.i apply in the formation of IMPF *padneše* 'you (sg.) fell', and 4a (but not 4b.i) applies in the formation of AOR *padna* 'you (sg.) fell'. Despite the apparent economy of this analysis, it has one defect: the fact that both 2sg and 3sg past-tense forms lack the past tense suffix *-v* in slot II is unrelated to the fact that both 2sg and 3sg imperfect forms have *-še* in slot III and that both 2sg and 3sg aorist forms have no suffix in slot III. On an analysis incorporating the rule of referral in 2, by contrast, this correlation between slot II morphology and slot III morphology is not portrayed as mere coincidence, but follows as a consequence of 2. This, then, is a case in which a rule of referral affords the most economical account of syncretism.

A somewhat different example is furnished by the Sanskrit forms in Table 3. As these forms suggest, the nominative and accusative cases of neuter nouns

		SINGULAR	DUAL	PLURAL
NEUTER V-STEMS:				
a-stem:	*yuga-* 'yoke'	*yugam*	*yuge*	*yugāni*
i-stem:	*vāri-* 'water'	*vāri*	*vāriṇī*	*vārīṇi*
ṛ-stem:	*dātṛ-* 'giver'	*dātṛ*	*dātṛṇī*	*dātṝṇi*
NEUTER C-STEMS:				
radical C-stem:	*jagat-* 'world'	*jagat*	*jagatī*	*jaganti*
as-stem:	*manas-* 'mind'	*manas*	*manasī*	*manāṁsi*
an-stem:	*nāman-* 'name'	*nāma*	*nāmnī, nāmanī*	*nāmāni*

TABLE 3. Nominative/accusative forms of some neuter nouns in Sanskrit.

are always syncretized in Sanskrit. To account for this syncretism, one might propose the rule of referral in 5.

(5) In the declension of neuter nouns, the nominative has the same form as the accusative.

One might, however, seek to dispense with the rule of referral in 5 by treating this case of syncretism like that of the 2pl and 3pl in the Welsh Romany present and imperfect tenses. For instance, one might assume that the Sanskrit neuter noun *yuga-* 'yoke' has *yugam* as its default singular form, *yuge* as its default dual form, and *yugāni* as its default plural form, and that these default forms surface just in case they are not overridden by some other inflectional rule. In the absence of any rule realizing the specification 'nominative case' or 'accusative case' in neuter nouns, these default forms would give rise to the syncretism exhibited in Table 3. The defect of such an analysis is that it would portray the recurrence of the nominative/accusative syncretism in all three numbers of all neuter declensions as coincidence. The rule of referral in 5, by contrast, allows one to view the syncretism of nominative and accusative in neuter nouns as a unified phenomenon. The motivation for 5 is therefore different from the motivation for the Macedonian rule of referral in 2. In the Macedonian case the rule of referral makes it possible to account for the fact that distinct affix positions or slots in a word's morphology participate in the same pattern of syncretism, while the rule of referral in 5 makes it possible to account for the recurrence of a single pattern of syncretism in distinct paradigms or in different parts of the same paradigm. Zwicky's (1985:377f.) rule referring the form of the accusative to that of the nominative in German is similarly motivated.

2.2. RULE INTERACTIONS INVOLVING RULES OF REFERRAL. It is customary to assume that, when two rules of exponence are applicable to the same expression, one may override the other. Typically, this override relation is mediated by the Elsewhere Condition: if two rules of exponence are in competition with each other and one is applicable only in a proper subset of the cases in which the other is applicable, the narrower one overrides the broader one. As an example, consider again 1pl PRES *kamása* 'we love' in the Welsh Romany paradigm in Table 1. According to the analysis proposed earlier, two different rules of exponence are available to spell out the inflectional exponents of the specification 'first person plural present tense' in Welsh Romany: one is the

rule of *-éna* suffixation applicable in all plural present-tense forms, and the other is the rule of *-ása* suffixation applicable in 1pl present-tense forms. Since the set of morphosyntactic feature specifications realized by *-ása* suffixation properly contains that realized by *-éna* suffixation, *-ása* suffixation overrides *-éna* suffixation in the formation of *kamása*.

Zwicky 1985 develops the hypothesis that the interaction of rules of referral with each other and with rules of exponence is regulated by this same principle. According to this hypothesis, rules of referral may participate in at least three different kinds of rule interaction: (i) a rule of referral may override a competing rule of exponence; (ii) a rule of referral may be overridden by a competing rule of exponence; and (iii) one rule of referral may override another. Consider an example of each of these three types.

2.2.1. A RULE OF REFERRAL OVERRIDING A RULE OF EXPONENCE. In the informal analysis of Macedonian conjugation proposed in §2.1, both the rule of referral in 2 and the rule of *-v* suffixation in 3a are applicable in 2sg past-tense forms; but of the two, only 2 applies in determining the form of IMPF *padneše* 'you (sg.) fell' and of AOR *padna* 'you (sg.) fell'. This override can be plausibly attributed to the Elsewhere Condition, since the rule of referral in 2 is applicable in only a subset of the cases in which 3a is applicable.

2.2.2. A RULE OF REFERRAL OVERRIDDEN BY A RULE OF EXPONENCE. Consider the partial declensional paradigms from Sanskrit in Table 4. As these partial paradigms reveal, the ablative is nearly always syncretized in Sanskrit: in the dual and plural numbers, the ablative case always takes on the form assigned

		SINGULAR	DUAL	PLURAL
V-STEMS:				
a-stem: *aśva-* 'horse':	DAT	*aśvāya*	*aśvābhyām*	*aśvebhyas*
	ABL	*aśvāt*	*aśvābhyām*	*aśvebhyas*
	GEN	*aśvasya*	*aśvayos*	*aśvānām*
ā-stem: *senā-* 'army':	DAT	*senāyai*	*senābhyām*	*senābhyas*
	ABL	*senāyās*	*senābhyām*	*senābhyas*
	GEN	*senāyās*	*senayos*	*senānām*
masc. *i*-stem: *agni-* 'fire':	DAT	*agnaye*	*agnibhyām*	*agnibhyas*
	ABL	*agnes*	*agnibhyām*	*agnibhyas*
	GEN	*agnes*	*agnyos*	*agnīnām*
polysyll. *ī*-stem: *nadī-* 'river':	DAT	*nadyai*	*nadībhyām*	*nadībhyas*
	ABL	*nadyās*	*nadībhyām*	*nadībhyas*
	GEN	*nadyās*	*nadyos*	*nadīnām*
C-STEMS:				
radical C-stem: *marut-* 'wind':	DAT	*marute*	*marudbhyām*	*marudbhyas*
	ABL	*marutas*	*marudbhyām*	*marudbhyas*
	GEN	*marutas*	*marutos*	*marutām*
neut. *as*-stem: *manas-* 'mind':	DAT	*manase*	*manobhyām*	*manobhyas*
	ABL	*manasas*	*manobhyām*	*manobhyas*
	GEN	*manasas*	*manasos*	*manasām*
an-stem: *rājan-* 'king':	DAT	*rājñe*	*rājabhyām*	*rājabhyas*
	ABL	*rājñas*	*rājabhyām*	*rājabhyas*
	GEN	*rājñas*	*rājños*	*rājñām*

TABLE 4. Dative, ablative, and genitive forms of some Sanskrit nouns.

to the dative case, and in the singular it generally takes on the form assigned to the genitive case. To account for the latter syncretism, one might postulate the following rule of referral:

(6) In the singular, the ablative has the same form as the genitive.

The rule in 6 is valid for all classes of Sanskrit nouns except for the *a*-stems, which have distinct ablative singular and genitive singular forms, as specified by the rules of exponence in 7.

(7) a. With *a*-stems, the specification 'ablative singular' is realized by the suffixation of *-āt*.
b. With *a*-stems, the specification 'genitive singular' is realized by the suffixation of *-sya*.

Rather than complicate the statement of the rule of referral in 6 with an explicit stipulation that the rule is inapplicable to *a*-stems, one might instead simply assume that the rule of exponence in 7a overrides 6. Rule 7a is narrower in its applicability than 6 because it is restricted to *a*-stems; thus, by the Elsewhere Condition, 7a overrides 6.

2.2.3. ONE RULE OF REFERRAL OVERRIDING ANOTHER. Consider again the Sanskrit forms in Table 4. In the dual and the plural, the ablative form of a substantive is always identical to its dative form. This fact might be taken to reflect a single very general rule of referral:

(8) The ablative has the same form as the dative.

Because number is unspecified in 8, this rule is in principle applicable to ablative singular forms as well as to ablative duals and plurals; but because the rule of referral in 6 applies specifically to ablative singulars, the Elsewhere Condition correctly predicts that it should override 8 in determining a noun's ablative singular form.

Any minimally adequate theory of rules of referral should account for these kinds of rule interactions. In §3 I propose a theory which satisfies this criterion and also captures a variety of more subtle facts about syncretism in inflectional paradigms.

3. A FORMAL APPROACH TO RULES OF REFERRAL IN PARADIGM FUNCTION MORPHOLOGY. The theory proposed here is grounded in the assumptions of Paradigm Function Morphology. The formal principles of the theory are presented in §3.1; in §§3.2 and 3.3 these principles are applied to the Macedonian and Sanskrit referrals discussed in §2.2.

3.1. NOTATION AND DEFINITIONS. In Paradigm Function theory four types of rules are distinguished: MORPHOLEXICAL RULES (= rules of exponence),[7] RULES

[7] The sense of 'morpholexical rule' assumed here is that of Matthews (1972:54), and should not be confused with Lieber's (1980) or Spencer's (1988) use of the same term.

As the following discussion unfolds, it will sometimes be convenient to use standard set-theoretic notational conventions: $S \subseteq T$ ('set S is a subset of set T'), $S \subset T$ ('set S is a proper subset of set T'), $x \in S$ ('x is a member of set S'), $S \cup T$ ('the union of sets S and T'), and $S \cap T$ ('the intersection of sets S and T').

OF REFERRAL, PARADIGM FUNCTIONS, and MORPHOLEXICAL FUNCTIONS. The formats for these types of rules are given in 9–12.

(9) Format for morpholexical rules:
$MLR_{n,[\tau]}(x) = y$ CLASS: X

(10) Format for rules of referral:
$RR_{n,[\tau]}([\sigma]) = [\sigma]/[F_1{:}v_1, \ldots, F_m{:}v_m]$ CLASS: X

(11) Format for paradigm functions: $PF_{[\sigma]}(x) = y$

(12) Format for morpholexical functions: $MLF_{n,[\sigma]}(x) = y$

These four types of rules do four different kinds of things. Morpholexical rules spell out the individual exponents of some set of morphosyntactic feature specifications; thus, the application of the morpholexical rule $MLR_{n,[\tau]}$ to an expression x to produce an expression y realizes the set $[\tau]$ of morphosyntactic feature specifications. For instance, in Macedonian the 1pl IMPF *padnevme* arises from the verb root *padn-* 'fall' through the successive application of three morpholexical rules: a rule of *-e* suffixation applying by default when no other stem-forming rule is applicable, a rule of *-v* suffixation realizing the specification 'past tense', and a rule of *-me* suffixation realizing the specification 'first person plural'. The position of a given morpholexical rule $MLR_{n,[\tau]}$ in the sequence of rules by which a word's inflections are spelled out is specified by its numeral subscript n. The morpholexical rules which introduce the suffixes *-e*, *-v*, and *-me* in the formation of *padnevme* have the respective numeral subscripts I, II, and III, corresponding to the affix positions I, II, and III in Table 2. A rule's numeral subscript needn't always correspond to an affix position, however; for instance, in the sequence of morpholexical rules which apply to convert Sanskrit *agni-* 'fire' to GEN.sg *agnes*, one is concatenative (that of *-s* suffixation), while the other (effecting stem gradation) is not. Strictly speaking, therefore, the numeral subscript n designates a position in the sequence of rules spelling out some word's inflections.

Rules of referral link those sets of morphosyntactic feature specifications whose exponents are syncretized. Thus, where $[\sigma]$ is any set of morphosyntactic feature specifications such that $[\tau] \subseteq [\sigma]$, the result of applying the rule of referral $RR_{n,[\tau]}$ to $[\sigma]$ is another set of feature specifications which is like $[\sigma]$ except as required by the definition of $RR_{n,[\tau]}$. (The notation '$[\sigma]/[F_1{:}v_1, \ldots, F_m{:}v_m]$' in 10 is to be interpreted as that set of feature specifications which is like $[\sigma]$ except that for each feature $[F_i]$, $1 \leq i \leq m$, its specification for $[F_i]$ is $[F_i{:}v_i]$.) For instance, the syncretism of *padneše* 'you (sg.) fell' and *padneše* 's/he fell' in Macedonian arises as the consequence of a rule of referral applying to the specification 'second person singular imperfect' to yield the specification 'third person singular imperfect'. I assume that rules of referral have as their compass the individual steps by which a fully inflected word is built up from the root of its paradigm (an assumption examined in depth in §4). Where n is some position in the sequence of rules by which a word's inflections are spelled out, then, the rule of referral $RR_{n,[\tau]}$ defines a syncretism operative at position n. Because the syncretism of the 2sg and 3sg in the Macedonian past tenses is operative in each of the affix positions I, II, and III, the rule of referral defining

this syncretism is in fact a rule schema whose numeral subscript is a variable ranging over I, II, and III.

Both morpholexical rules and rules of referral may be restricted to a particular morphological subclass (identified in 9 and 10 as 'CLASS: X'): if a morpholexical rule $MLR_{n,[\tau]}$ is restricted to some such subclass X, it is only applicable to expressions belonging to X; if a rule of referral is restricted to some subclass X, the syncretism which it expresses is only operative for members of X. I shall use the notation '$CLASS_{R_{n,[\tau]}}$' to indicate the morphological class to which the rule $R_{n,[\tau]}$ is restricted; here and below, a rule abbreviated as '$R_{n,[\tau]}$' may be either a morpholexical rule $MLR_{n,[\tau]}$ or a rule of referral $RR_{n,[\tau]}$.

Certain morpholexical rules and rules of referral bearing the same numeral subscript stand in the override relation defined in 13; the importance of this relation will be made clear presently.

(13) Definition of the OVERRIDE relation:
$R_{n,[\tau]}$ overrides $R_{n,[\tau']}$ if
i. $[\tau'] \subset [\tau]$ or
ii. $[\tau] = [\tau']$ but $CLASS_{R_{n,[\tau]}} \subset CLASS_{R_{n,[\tau']}}$.

Paradigm functions apply to the root of a paradigm to yield the various fully inflected words constituting that paradigm. The paradigm function $PF_{[\sigma]}$ thus applies to the root x to yield that member of x's paradigm whose inflections realize the complete and fully specified set $[\sigma]$ of morphosyntactic features appropriate to the category of x.[8] For instance, there is a paradigm function which applies to Macedonian verb roots to produce their 1pl imperfect form; this paradigm function applies to *padn-* 'fall' to yield *padnevme*.

Paradigm functions are ordinarily defined in terms of morpholexical functions. For any position n in the sequence of rules by which a word's inflections are spelled out and any complete and fully specified set $[\sigma]$ of morphosyntactic features appropriate to that word's category, there is a morpholexical function $MLF_{n,[\sigma]}$ that determines which rule (if any) applies at position n to realize $[\sigma]$. Given the definitions of the morpholexical rules and rules of referral associated with position n, the value of $MLF_{n,[\sigma]}$ for a given argument follows from two general principles: the Maximal Subset Override (14; cf. Stump 1992:215, 1993a) and the Identity Function Default (15; cf. Stump 1992:216, 1993a).

(14) MAXIMAL SUBSET OVERRIDE:
a. If $RR_{n,[\tau]}$ determines the value of $MLF_{n,[\sigma]}(x)$, then $MLF_{n,[\sigma]}(x) = MLF_{n,[\sigma']}(x)$, where $[\sigma'] = RR_{n,[\tau]}([\sigma])$.
b. If $MLR_{n,[\tau]}$ determines the value of $MLF_{n,[\sigma]}(x)$, then $MLF_{n,[\sigma]}(x) = MLR_{n,[\tau]}(x)$.

(15) IDENTITY FUNCTION DEFAULT:
$MLF_{n,[\sigma]}(x) = x$

[8] More precisely, $[\sigma]$ is assumed to contain specifications for all relevant W-FEATURES (where a morphosyntactic feature F is a W[ord]-feature only if words in the same inflectional paradigm may carry contrasting specifications for F).

The Maximal Subset Override is, in effect, a formalization of the Elsewhere Condition as it applies to the evaluation of morpholexical functions. It makes reference to a relation of DETERMINATION which may exist between a morpholexical rule or rule of referral and the value of a morpholexical function associated with the same position; this relation is explicitly defined in 16. If a rule of referral $RR_{n,[\tau]}$ determines the value of the morpholexical function $MLF_{n,[\sigma]}$ for some argument x, then this value is as required by clause 14a of the Maximal Subset Override. If a morpholexical rule $MLR_{n,[\tau]}$ determines the value of $MLF_{n,[\sigma]}$ for some argument x, then this value is as required by clause 14b of the Maximal Subset Override. If no rule determines the value of $MLF_{n,[\sigma]}(x)$, then this value defaults to x itself, in accordance with the Identity Function Default in 15. Because of the way in which they interact with the Maximal Subset Override and the Identity Function Default, morpholexical rules and rules of referral serve, in effect, as clauses in the definitions of morpholexical functions.

(16) Definition of the DETERMINATION relation: Where $R_{n,[\tau]}$ is a rule of referral or morpholexical rule and $MLF_{n,[\sigma]}$ is a morpholexical function, $R_{n,[\tau]}$ DETERMINES the value of $MLF_{n,[\sigma]}(x)$ if $R_{n,[\tau]}$ is such that
  a. $x \in CLASS_{R_{n,[\tau]}}$,
  b. $[\tau] \subseteq [\sigma]$, and
  c. there is no other rule $R_{n,[\tau']}$ such that
    i. $x \in CLASS_{R_{n,[\tau']}}$,
    ii. $[\tau'] \subseteq [\sigma]$, and
    iii. $R_{n,[\tau']}$ overrides $R_{n,[\tau]}$.

Given this system of definitions, consider how it might be applied in accounting for the various interactions involving rules of referral that we saw in §2.2. As I will show, the definition of the Maximal Subset Override in 14 correctly predicts these interactions.

3.2. AN ANALYSIS OF THE SYNCRETISM OF THE SECOND AND THIRD PERSONS SINGULAR IN THE MACEDONIAN PAST TENSES. I assume that Macedonian finite verb forms are specified for at least the four morphosyntactic features in 17, and that sets of specifications of these features are subject to the co-occurrence restriction 18.

(17) Morphosyntactic features and their values for a fragment of Macedonian verbal morphology:

FEATURE	PERMISSIBLE VALUES
[PAST]:	'yes', 'no'
[IMPF]:	'yes', 'no'
[PER]:	'1', '2', '3'
[NUM]:	'sg', 'pl'

(18) Co-occurrence restriction on feature specifications: [IMPF:yes] implies [PAST:yes]

The morpholexical rules that (I assume) are necessary to generate the forms in Table 2 are as in 19. The rules in 19a are responsible for spelling out the

stem-forming suffixes occupying slot I: *-e* suffixation is the default for slot I and is overridden in three situations—by *-a* suffixation in aorist forms of verbs in the same inflectional class as *padn-* 'fall' (here termed 'Class A'), by *-i* suffixation in present and aorist forms of verbs in the same class as *nos-* 'carry' ('Class B'), and by *-o* suffixation in first person or plural aorist forms of verbs in the same class as *id-* 'go' ('Class C').[9] (This account of slot I stem-forming suffixes is not exhaustive; there are other verbal inflectional classes besides the three represented in Table 2. See Elson 1989 for a thorough discussion of Macedonian verbal stem-formation.) The morpholexical rule schema in 19b spells out the slot II suffix *-v* in nonthird person past tense forms and the rules in 19c spell out the various personal endings associated with slot III.

(19) Morpholexical rules for a fragment of Macedonian morphology:

a. Rules for slot I:

i. $MLR_{I,\emptyset}([_{v}x])$	$= [_{v}[_{v}x]e]$	
ii. $MLR_{I,[PAST:yes,\ IMPF:no]}([_{v}x])$	$= [_{v}[_{v}x]a]$	CLASS: A
iii. $MLR_{I,[IMPF:no]}([_{v}x])$	$= [_{v}[_{v}x]i]$	CLASS: B
iv. (Rule schema) Where $\alpha = 1$ or $\beta = pl$, $MLR_{I,[PAST:yes,\ IMPF:no,\ PER:\alpha,\ NUM:\beta]}([_{v}x])$	$= [_{v}[_{v}x]o]$	CLASS: C

b. Rule schema for slot II: Where $\alpha \neq 3$,

$MLR_{II,[PAST:yes,\ PER:\alpha]}([_{v}x]) = [_{v}[_{v}x]v]$

c. Rules for slot III:

i. $MLR_{III,[PAST:no,\ PER:1,\ NUM:sg]}([_{v}x])$	$= [_{v}[_{v}x]$ am$]$
ii. $MLR_{III,[PAST:no,\ PER:2,\ NUM:sg]}([_{v}x])$	$= [_{v}[_{v}x]$ š$]$
iii. $MLR_{III,[IMPF:yes,\ PER:3,\ NUM:sg]}([_{v}x])$	$= [_{v}[_{v}x]$ še$]$
iv. $MLR_{III,[PER:1,\ NUM:pl]}([_{v}x])$	$= [_{v}[_{v}x]$ me$]$
v. $MLR_{III,[PER:2,\ NUM:pl]}([_{v}x])$	$= [_{v}[_{v}x]$ te$]$
vi. $MLR_{III,[PAST:no,\ PER:3,\ NUM:pl]}([_{v}x])$	$= [_{v}[_{v}x]$ at$]$
vii. $MLR_{III,[PAST:yes,\ PER:3,\ NUM:pl]}([_{v}x])$	$= [_{v}[_{v}x]$ a$]$

Given the proposed rule format, the rule of referral in 2 can now be formulated as the schema in 20. Because its numeral subscript *n* ranges over I, II, and III, 20 competes with the morpholexical rules in 19a to determine the value of $MLF_{I,[\sigma]}$ (for some $[\sigma]$), with the rule schema in 19b to determine the value of $MLF_{II,[\sigma]}$, and with the rules in 19c to determine the value of $MLF_{III,[\sigma]}$.

(20) Referral rule schema for a fragment of Macedonian morphology:
$RR_{n,[PAST:yes,\ PER:2,\ NUM:sg]}([\sigma]) = [\sigma]/[PER:3]$ (where n = I, II, or III)

Finally, a single paradigm function schema characterizes all of the verb forms in Table 2:

(21) Paradigm function schema for a fragment of Macedonian morphology:
Where $[\sigma] = [PAST:\alpha, IMPF:\beta, PER:\gamma, NUM:\delta]$,
$PF_{[\sigma]}([_{v}x]) = MLF_{III,[\sigma]}(MLF_{II,[\sigma]}(MLF_{I,[\sigma]}([_{v}x])))$

The morpholexical rules in 19 and the referral rule schema in 20 compete to determine the values of the three morpholexical functions in 21, in accordance with the Maximal Subset Override. Consider some examples. If $[\sigma]$ is as in 22,

[9] I assume that morphophonemic rules elide any slot I suffix before the 1sg present-tense ending *-am* and elide the slot I suffixes *-e* and *-i* before the 3pl ending *-at;* cf. Lunt (1952:73).

then $PF_{[\sigma]}([_{v}padn])$ [= the 1pl aorist form of *padn-* 'fall'] is assigned the value *padnavme,* in accordance with 21 and the Maximal Subset Override:[10]

(22) Where $[\sigma]$ = [PAST:yes, IMPF:no, PER:1, NUM:pl], $PF_{[\sigma]}([_{v}padn])$
$= MLF_{III,[\sigma]}(MLF_{II,[\sigma]}(MLF_{I,[\sigma]}([_{v}padn])))$ [by 21]
$= MLR_{(19c.iv)}(MLR_{(19b)}(MLR_{(19a.ii)}([_{v}padn])))$ [by 14]
$= [_{v}[_{v}[_{v}padn]a]v]me]$ 'we fell'

(Here and below, I follow the expository convention of using '$MLR_{(n)}$' to refer to the morpholexical rule numbered (*n*) in the preceding text.) Similarly, if $[\sigma]$ is as in 23, then $PF_{[\sigma]}([_{v}padn])$ is assigned the value *padneše;* because there is no morpholexical rule or rule of referral which determines its value, $MLF_{II,[\sigma]}$ is in this instance evaluated in accordance with the Identity Function Default.

(23) Where $[\sigma]$ = [PAST:yes, IMPF:yes, PER:3, NUM:sg], $PF_{[\sigma]}([_{v}padn])$
$= MLF_{III,[\sigma]}(MLF_{II,[\sigma]}(MLF_{I,[\sigma]}([_{v}padn])))$ [by 21]
$= MLR_{(19c.iii)}(MLR_{(19a.i)}([_{v}padn]))$ [by 14, 15]
$= [_{v}[_{v}[_{v}padn]e]še]$'s/he fell'

If $[\sigma]$ is as in 24, then $PF_{[\sigma]}([_{v}padn])$ is also assigned the value *padneše:* the referral rule schema in 20 determines the value of each of the three morpholexical functions $MLF_{I,[\sigma]}$, $MLF_{II,[\sigma]}$, and $MLF_{III,[\sigma]}$; thus, by the Maximal Subset Override, the value of $PF_{[\sigma]}([_{v}padn])$ in 24 simply diverts to that of $PF_{[\sigma]/[PER:3]}([_{v}padn])$ in 23. Because the rule of referral $RR_{II,[PAST:yes, PER:2, NUM:sg]}$ (an instance of schema 20) overrides the morpholexical rule $MLR_{II,[PAST:yes, PER:2]}$ (an instance of schema 19b), it is the former rule that determines the value of $MLF_{II,[\sigma]}$ in 24. The formulation of the Maximal Subset Override in 14, then, accounts for the fact that a rule of referral can override a competing morpholexical rule (cf. §2.2.1).

(24) Where $[\sigma]$ = [PAST:yes, IMPF:yes, PER:2, NUM:sg], $PF_{[\sigma]}([_{v}padn])$
$= MLF_{III,[\sigma]}(MLF_{II,[\sigma]}(MLF_{I,[\sigma]}([_{v}padn])))$ [by 21]
$= MLF_{III,[\sigma]/[PER:3]}(MLF_{II,[\sigma]/[PER:3]}(MLF_{I,[\sigma]/[PER:3]}([_{v}padn])))$ [by 20]
$= MLR_{(19c.iii)}(MLR_{(19a.i)}([_{v}padn]))$ [by 14, 15]
$= [_{v}[_{v}[_{v}padn]e]še]$ 'you (sg.) fell'

The examples in 25 illustrate the formation of 2sg AOR *padna* 'you fell' and *ide* 'you went'. In each case the morpholexical functions $MLF_{I,[\sigma]}$, $MLF_{II,[\sigma]}$, and $MLF_{III,[\sigma]}$ are all three determined by the referral rule schema in 20,[11] but the morpholexical functions $MLF_{II,[\sigma]/[PER:3]}$ and $MLF_{III,[\sigma]/[PER:3]}$ must nevertheless be evaluated in accordance with the Identity Function Default, since neither of the latter functions is determined by any morpholexical rule or rule of referral.

[10] The value of a morpholexical function is not directly determined by a rule schema, but rather by some INSTANTIATION of that schema. The morpholexical rule schema in 19b, for example, has two instantiations—$MLR_{II,[PAST:yes, PER:1]}$ and $MLR_{II,[PAST:yes, PER:2]}$—and it is the former instantiation that determines the value of $MLF_{II,[\sigma]}$ in 22.

[11] As determination is defined in 16, the value of $MLF_{I,[\sigma]}$ in 25a is determined both by the referral rule schema in 20 and by the morpholexical rule 19a.ii; since $MLF_{I,[\sigma]/[PER:3]}$ is itself determined by 19a.ii, $MLF_{I,[\sigma]}([_{v}padn])$ is, in any event, ultimately evaluated as $MLR_{(19a.ii)}([_{v}padn])$.

(25) Where [σ] = [PAST:yes, IMPF:no, PER:2, NUM:sg],

a. $PF_{[\sigma]}([_{V}padn])$

$= MLF_{III,[\sigma]}(MLF_{II,[\sigma]}(MLF_{I,[\sigma]}([_{V}padn])))$ [by 21]

$= MLF_{III,[\sigma]/[PER:3]}(MLF_{II,[\sigma]/[PER:3]}(MLF_{I,[\sigma]/[PER:3]}([_{V}padn])))$ [by 20]

$= MLR_{(19a.ii)}([_{V}padn])$ [by 14, 15]

$= [_{V}[_{V}padn]a]$ 'you (sg.) fell'

b. $PF_{[\sigma]}([_{V}id])$

$= MLF_{III,[\sigma]}(MLF_{II,[\sigma]}(MLF_{I,[\sigma]}([_{V}id])))$ [by 21]

$= MLF_{III,[\sigma]/[PER:3]}(MLF_{II,[\sigma]/[PER:3]}(MLF_{I,[\sigma]/[PER:3]}([_{V}id])))$ [by 20]

$= MLR_{(19a.i)}([_{V}id])$ [by 14, 15]

$= [_{V}[_{V}id]e]$ 'you (sg.) went'

3.3. AN ANALYSIS OF THE ABLATIVE SYNCRETISMS IN SANSKRIT. Consider now the Sanskrit example from §2.2. I assume that Sanskrit substantives carry specifications for the three morphosyntactic features in 26.

(26) Morphosyntactic features and their values for a fragment of Sanskrit substantival morphology:

FEATURE	PERMISSIBLE VALUES
[CASE]:	dat, abl, gen, [...]
[NUM]:	sg, du, pl
[GEN]:	masc, fem, neut

I further assume that the morpholexical rules necessary to generate the forms in Table 4 are as in 27. The rules in 27a are responsible for the various stem modifications that appear in dative, ablative, and genitive forms, while those in 27b–d specify the dative, ablative, and genitive case-endings for the singular, dual, and plural numbers.[12] The rules of referral stated informally in 6 and 8 can now be formulated as the schemata in 28; each schema participates in the definition of both $MLF_{I,[\sigma]}$ and $MLF_{II,[\sigma]}$ (for a given set [σ] of morphosyntactic feature specifications).

(27) Inflectional rules for a fragment of Sanskrit morphology:

a. Rules of stem modification:

i. Where x' is the full grade form of x, α = dat or gen, and β = masc or fem,
$MLR_{I,[CASE:\alpha,\ NUM:sg,\ GEN:\beta]}([_{N}x]) = [_{N}x']$
CLASS: masculine *i*-stems ∪ polysyllabic *ī*-stems

ii. Where α = dat or gen,
$MLR_{I,[CASE:\alpha,\ NUM:sg]}([_{N}x)] = [_{N}[_{N}x]y\bar{a}]$ CLASS: *ā*-stems

iii. Where x' arises from x by changing its final vowel to e [$e \rightarrow ay$] (Whitney 1889:113,132),
$MLR_{I,[CASE:gen,\ NUM:du]}([_{N}x]) = [_{N}x']$ CLASS: *a*-stems ∪ *ā*-stems

iv. Where x' arises from x by changing its final vowel to e,
$MLR_{I,[CASE:dat,\ NUM:pl]}([_{N}x]) = [_{N}x']$ CLASS: *a*-stems

v. Where x' arises from x through the lengthening of its final vowel and the addition of a final *n*,
$MLR_{I,[CASE:gen,\ NUM:pl]}([_{N}x]) = [_{N}x']$ CLASS: V-stems

vi. Where x' arises from x through the lengthening of its final vowel,
$MLRI_{I,[CASE:dat,\ NUM:\ du]}([_{N}x]) = [_{N}x']$ CLASS: *a*-stems

[12] In a more comprehensive account of Sanskrit declensional morphology, the genitive dual rules 27a.iii and 27c.ii would have to be slightly modified; see §5.

b. Rules for singular case-endings:
   i. $MLR_{II,[CASE:dat,\ NUM:sg]}([_N x]) = [_N[_N x]e]$
   ii. $MLR_{II,[CASE:dat,\ NUM:sg]}([_N x]) = [_N[_N x]aya]$ CLASS: *a*-stems
   iii. $MLR_{II,[CASE:abl,\ NUM:sg]}([_N x]) = [_N[_N x]āt]$ CLASS: *a*-stems
   iv. $MLR_{II,[CASE:gen,\ NUM:sg]}([_N x]) = [_N[_N x]s]$
   v. $MLR_{II,[CASE:gen,\ NUM:sg]}([_N x]) = [_N[_N x]as]$ CLASS: C-stems
   vi. $MLR_{II,[CASE:gen,\ NUM:sg]}([_N x]) = [_N[_N x]sya]$ CLASS: *a*-stems

c. Rules for dual case-endings:
   i. $MLR_{II,[CASE:dat,\ NUM:du]}([_N x]) = [_N[_N x]bhyām]$
   ii. $MLR_{II,[CASE:gen,\ NUM:du]}([_N x]) = [_N[_N x]os]$

d. Rules for plural case-endings:
   i. $MLR_{II,[CASE:dat,\ NUM:pl]}([_N x]) = [_N[_N x]bhyas]$
   ii. $MLR_{II,[CASE:gen,\ NUM:pl]}([_N x]) = [_N[_N x]ām]$

(28) Referral rule schemata for a fragment of Sanskrit morphology (where n = I or II)
   a. $RR_{n,[CASE:abl]}([\sigma]) = [\sigma]/[CASE:dat]$
   b. $RR_{n,[CASE:abl,\ NUM:sg]}([\sigma]) = [\sigma]/[CASE:gen]$

By the paradigm function schema in 29, Sanskrit case-forms reflect the successive application of two morpholexical functions.

(29) Paradigm function schema for a fragment of Sanskrit morphology:
   Where $[_N x] \in [GEN:\gamma]$,
   $PF_{[CASE:\alpha,\ NUM:\beta]}([_N x])$
   $= MLF_{II,[CASE:\alpha,\ NUM:\beta,\ GEN:\gamma]}(MLF_{I,[CASE:\alpha,\ NUM:\beta,\ GEN:\gamma]}([_N x]))$

The referral rule schemata in 28 compete with each other and with the morpholexical rules in 27 to determine the values of the two morpholexical functions in 29. In the evaluation of $PF_{[CASE:abl,\ NUM:pl]}([_N agni])$ in 30, schema 28a determines the values of both $MLF_{I,[\sigma]}$ and $MLF_{II,[\sigma]}$, causing the value of $PF_{[CASE:abl,\ NUM:pl]}([_N agni])$ to divert to that of $PF_{[CASE:dat,\ NUM:pl]}([_N agni])$: *agnibhyas*.

(30) Where $[\sigma]$ = [CASE:abl, NUM:pl, GEN:masc],
   $PF_{[CASE:abl,\ NUM:pl]}([_N agni])$
   $= MLF_{II,[\sigma]}(MLF_{I,[\sigma]}([_N agni]))$ [by 29]
   $= MLF_{II,[\sigma]/[CASE:dat]}(MLF_{I,[\sigma]/[CASE:dat]}([_N agni]))$ [by 28a]
   $= MLR_{(27d.i)}([_N agni])$ [by 14, 15]
   $= [_N[_N agni]bhyas]$ 'from the fires'

In the evaluation of $PF_{[CASE:abl,\ NUM:sg]}([_N agni])$ in 31, schemata 28a and 28b are in competition. Because 28b overrides 28a, it is 28b that determines the values of both $MLF_{I,[\sigma]}$ and $MLF_{II,[\sigma]}$, causing the value of $PF_{[CASE:abl,\ NUM:sg]}([_N agni])$ to divert to that of $PF_{[CASE:gen,\ NUM:sg]}([_N agni])$: *agnes*. Thus, the formulation of the Maximal Subset Override in 14 accounts for the fact that one rule of referral can override another (cf. §2.2.3).

(31) Where $[\sigma]$ = [CASE:abl, NUM:sg, GEN:masc],
   $PF_{[CASE:abl,\ NUM:sg]}([_N agni])$
   $= MLF_{II,[\sigma]}(MLF_{I,[\sigma]}([_N agni]))$ [by 29]
   $= MLF_{II,[\sigma]/[CASE:gen]}(MLF_{I,[\sigma]/[CASE:gen]}([_N agni]))$ [by 28b]
   $= MLR_{(27b.iv)}(MLR_{(27a.i)}([_N agni]))$ [by 14]
   $= [_N[_N agne]s]$ 'from the fire'

Finally, in the evaluation of $PF_{[CASE:abl,\ NUM:sg]}([_N$aśva]) in 32, the ablative singular morpholexical rule 27b.iii competes with $RR_{II,[CASE:abl,\ NUM:sg]}$ (an instance of the referral rule schema 28b); because $CLASS_{MLR(27b.iii)}$ is a proper subset of $CLASS_{RR_{II,[CASE:abl,\ NUM:sg]}}$—which, being unspecified in 28b, is by convention assumed to be the set of all relevant expressions, namely substantives—27b.iii overrides $RR_{II,[CASE:abl,\ NUM:sg]}$ and therefore determines the value of $MLF_{II,[\sigma]}$ in 32. The formulation of the Maximal Subset Override in 14 accounts for the fact that a morpholexical rule may override a competing rule of referral (cf. §2.2.2).

(32) Where [σ] = [CASE:abl, NUM:sg, GEN:masc],
$PF_{[CASE:abl,\ NUM:sg]}([_N$aśva])
$= MLF_{II,[\sigma]}(MLF_{I,[\sigma]}([_N$aśva])) [by 29]
$= MLR_{(27b.iii)}([_N$aśva]) [by 14, 15]
$= [_N[_N$aśva]āt] 'from the horse'

Besides accounting for the range of rule interactions observed in §2.2, the proposed theory has additional advantages for the analysis of syncretism. These are discussed in the following three sections.

4. THE COMPASS OF RULES OF REFERRAL. On first consideration, the Paradigm Function Theory might seem to afford two different conceptions of rules of referral. First, one might assume that a rule of referral encompasses whole words. On this assumption, the rule of referral determining the form of Macedonian IMPF *padneše* 'you (sg.) fell' would simply fill the 2sg imperfect cell in the paradigm of *padn-* with the form *padneše* 's/he fell' occupying the 3sg imperfect cell in that paradigm. Viewed in this way, the relevant rule of referral could be stated as a restriction on the evaluation of a paradigm function, as in 33.

(33) Where [σ] =[PAST:yes, IMPF:α, PER:2, NUM:sg], the value of $PF_{[\sigma]}([_V X])$ is identical to that of $PF_{[\sigma]/[PER:3]}([_V X])$

I shall refer to this approach to rules of referral as the BROAD APPROACH. Alternatively, one might assume that rules of referral encompass the individual steps by which a fully inflected word is built up from the root of its inflectional paradigm. On this assumption, the rule of referral determining the form of Macedonian IMPF *padneše* 'you (sg.) fell' would do so one layer at a time, successively filling the affix positions I, II, and III with the affixes occupying these same positions in *padneše* 's/he fell'. This is the conception of rules of referral adopted in §3. Thus, where [σ] is as in 33, the evaluation of $PF_{[\sigma]}([_V$padn]) involves not one but three referrals: in accordance with the Maximal Subset Override, the referral rule schema in 20 causes $MLF_{I,[\sigma]}$ to be evaluated as $MLF_{I,[\sigma]/[PER:3]}$, $MLF_{II,[\sigma]}$ to be evaluated as $MLF_{II,[\sigma]/[PER:3]}$, and $MLF_{III,[\sigma]}$ to be evaluated as $MLF_{III,[\sigma]/[PER:3]}$. I shall refer to this approach to rules of referral as the NARROW APPROACH.

Although these alternative approaches to rules of referral might initially seem to be practically indistinguishable in their consequences, there are at least two good reasons for preferring the narrow approach. First, only the narrow approach provides a ready account of interactions between rules of referral and

morpholexical rules. On the narrow approach, rules of referral—like morpholexical rules—serve as clauses in the definitions of morpholexical functions; their interaction with morpholexical rules is accordingly regulated by the Maximal Subset Override, as in 24 and 32. Under the broad approach, there is no straightforward means of capturing this similarity between rules of referral and morpholexical rules vis-à-vis the Maximal Subset Override.

Second, the narrow approach—unlike the broad approach—is compatible with the existence of cases in which syncretism within a particular affix position class does not coincide with whole-word syncretism. An example is provided by the formation of perfects in Vedic Sanskrit. For expository clarity, I shall maintain a three-way terminological distinction between SIMPLE perfects (indicative perfects lacking the preterite prefix *á-*), PLUPERFECTS (indicative perfects carrying the preterite prefix *á-*), and MODAL PERFECTS (perfects marked for the subjunctive, injunctive, optative, or imperative mood). Consider first the simple perfect forms in Table 5.

		SINGULAR	DUAL	PLURAL
ACTIVE:	1ST	*tutóda*	*tutudvá*	*tutudmá*
	2ND	*tutóditha*	*tutudáthur*	*tutudá*
	3RD	*tutóda*	*tutudátur*	*tutudúr*
MIDDLE:	1ST	*tutudé*	*tutudvā́he*	*tutudmáhe*
	2ND	*tututsé*	*tutudā́the*	*tutuddhvé*
	3RD	*tutudé*	*tutudā́te*	*tutudré*

TABLE 5. Simple perfect forms of Vedic *tud-* 'strike'.

The personal endings employed in such simple perfect forms are generally distinct from those employed in other tense/mood combinations, though there are some points of overlap; for instance, the 1sg middle suffix *-e* (*tutud-é* 'I have struck') also appears in the present indicative (*bruv-é* 'I speak'). Nevertheless, the simple perfect personal endings exhibit one regular syncretism which doesn't show up elsewhere: in both the active and the middle voices, the 3sg ending is identical to the 1sg ending. This is true even in the simple perfect paradigms of verb roots in *ā*, in which the irregular 1sg active ending *-au* appears in the 3sg active as well (e.g. *dhā-* 'place': *dadháu* 'I have placed', *dadháu* 's/he has placed'). A second formal characteristic of Vedic perfects is that they are built upon a reduplicated stem (e.g. *tud-* → *tutud-*) which may appear in an accented 'strong' form (*tutód-*) or an unaccented 'weak' form (*tutud-*); in the simple perfect, the strong form appears in the singular active and the weak form elsewhere. There is, however, a class of verbs ('Class L') which exhibit two different strong stem-forms in the simple perfect: a lengthened-grade stem-form appearing in the 3sg active and a full-grade stem-form appearing elsewhere in the singular active; the partial paradigms in Table 6 illustrate.[13] What these forms show is that, even though the personal endings

[13] Full-grade stem-forms exhibit the vocalism *a/e/o;* lengthened-grade stem-forms instead have the vocalism *ā/ai/au*.

	kṛ- 'do'	*nī-* 'lead'	*stu-* 'praise'	*vac-* 'speak'
1ST	*cakára*	*ninấya*	*tuṣṭấva*	*uváca*
2ND	*cakártha*	*ninétha*	*tuṣṭóṭha*	*uváktha*
3RD	*cakấra*	*ninấya*	*tuṣṭấva*	*uváca*

TABLE 6. Singular active forms of some Vedic class L roots in the simple perfect.

are syncretized in the 1sg and 3sg of the simple perfect, the perfect stem-form is not similarly syncretized.[14]

This pattern of syncretism is not reconcilable with the broad approach to rules of referral, which entails that all syncretisms are whole-word syncretisms; it is easily accounted for, however, under the narrow approach. To see this, consider an analysis in which Vedic simple perfect forms arise from the root of their paradigm through the application of four morpholexical functions, in accordance with the paradigm function schema in 34:[15]

(34) Paradigm function schema for Vedic simple perfect forms:
Where $[\sigma]$ =[SYS:perf, PRET:no, MOOD:indic, PER:α, NUM:β, VCE:γ],
$PF_{[\sigma]}([_{V}x]) = MLF_{IV,[\sigma]}(MLF_{III,[\sigma]}(MLF_{II,[\sigma]}(MLF_{I,[\sigma]}([_{V}x]))))$

MLF_I determines the basic form of the perfect stem; its value defaults to that of the reduplication rule MLR_I in 35a.[16] MLF_{II} determines the vowel grade of the perfect stem; by the Identity Function Default, the perfect stem ordinarily remains in its basic (zero-grade) form, but is strengthened to its accented full-grade or lengthened-grade form in the singular indicative active, in accordance with the morpholexical rules in 35b.[17] MLF_{III} determines which personal ending

[14] Perhaps partial syncretism such as that exhibited by the 1sg and 3sg forms in Table 6 is inherently unstable; this might account for the gradual extension of the lengthened-grade stem-form from the 3sg active to the 1sg active in later Sanskrit (Whitney 1889:283).

[15] In the analysis proposed here, I assume the following system of morphosyntactic features for Vedic finite verb forms. The feature [SYS(TEM)] has the values present, perf, aorist, and future; [PRET(ERITE)] has the values 'yes' and 'no'; [MOOD] has the values imperative, indic, injunction, optative, and subjunctive; [PER] has the values '1', '2', and '3'; [NUM] has the values 'sg', 'du', and 'pl'; and [V(OI)CE] has the values act and mid. [PRET] distinguishes augmented forms (i.e. those bearing the preterite prefix *á-*): imperfects are [SYS:present, PRET:yes], pluperfects are [SYS:perf, PRET:yes], aorist indicatives are [SYS:aorist, PRET:yes], and conditionals are [SYS: future, PRET:yes]. On the assumption that augmented forms are specified [MOOD:indic], the only distinction in feature content between simple perfects and pluperfects is therefore that the former are [PRET:no]. This feature analysis squares with the semantic versatility of the Vedic perfect, which (unlike its reflex in later Sanskrit) can refer to the present as well as to the past (Whitney 1889:296). It should also be noted that the Vedic perfect is so named only because it is formally cognate with the Greek perfect, not because it regularly expresses perfect aspect; the English present perfect is an expedient way of glossing the Vedic perfect, but the fit is a loose one at best.

[16] The default value that 35a supplies for MLF_I may be overridden; for instance, there is a class of verbs whose weak perfect stem arises through modification of the root vowel rather than through reduplication (e.g. *tap-* 'heat': 1sg PERF ACT *tatápa*, 3pl PERF ACT *tepúr*).

The formulation in 35a is only approximate, since Sanskrit (including Vedic) possesses several distinct reduplication rules; cf. Janda & Joseph 1986.

[17] As formulated, the rules in 35b guarantee that pluperfect forms will exhibit the full-grade stem in the singular active but that they will not exhibit the lengthened-grade stem in the 3sg active.

is affixed to a simple perfect form; the clauses in its definition include the morpholexical rules in 35c.[18] MLF_{IV} has a single clause in its definition—the default morpholexical rule 35d, which marks unaccented perfect forms for accent on their termination; by the Identity Function Default, forms which have already been marked for stem accent by the rules in 35b are unaffected by MLF_{IV}.[19]

(35) Some morpholexical rules for Vedic simple perfect forms:

a. $MLR_{I,[SYS:perf]}([_{v}x]) = [_{v}x']$, where x' is the reduplicated form of x.

b. i. $MLR_{II,[SYS:perf,\ MOOD:indic,\ NUM:sg,\ VCE:act]}([_{v}x]) = [_{v}x']$, where x' is the accented full-grade form of x.

ii. $MLR_{II,[SYS:perf,\ PRET:no,\ MOOD:indic,\ PER:3,\ NUM:sg,\ VCE:act]}([_{v}x]) = [_{v}x']$, where x' is the accented lengthened-grade form of x. CLASS: L

c. i. $MLR_{III,[SYS:perf,\ PRET:no,\ MOOD:indic,\ PER:1,\ NUM:sg,\ VCE:act]}([_{v}x]) = [_{v}[_{v}x]a]$

ii. $MLR_{III,[SYS:perf,\ PRET:no,\ MOOD:indic,\ PER:1,\ NUM:sg,\ VCE:act]}([_{v}x]) = [_{v}[_{v}x]au]$ CLASS: stems in *ā*

iii. $MLR_{III,[PRET:no,\ MOOD:indic,\ PER:1,\ NUM:sg,\ VCE:mid]}([_{v}x]) = [_{v}[_{v}x]e]$

iv. $MLR_{III,[SYS:perf,\ PRET:no,\ MOOD:indic,\ PER:2,\ NUM:sg,\ VCE:act]}([_{v}x]) = [_{v}[_{v}x]tha]$

v. $MLR_{III,[PRET:no,\ MOOD:indic,\ PER:2,\ NUM:sg,\ VCE:mid]}([_{v}x]) = [_{v}[_{v}x]se]$

d. $MLR_{IV,[SYS:perf]}([_{v}x]) = [_{v}x']$, where x is unaccented and x' is the result of marking x for accent on its termination.

The syncretism of the 1sg and 3sg in simple perfect forms is accounted for by the referral rule schema in 36:

(36) Referral rule schema for Vedic simple perfects (where n = I, II, III, or IV):

$RR_{n,[SYS:perf,\ PRET:no,\ MOOD:indic,\ PER:3,\ NUM:sg]}([\sigma]) = [\sigma]/[PER:1]$

To understand the interaction of 36 with the morpholexical rules in 35, consider a pair of examples. In this analysis, the 1sg simple perfect active form of *stu-* 'praise' is the value of $PF_{[\sigma]}([_{v}stu])$, where $[\sigma]$ is the set of feature specifications in 37. By 34, the value of $PF_{[\sigma]}([_{v}stu])$ is the result of applying the morpholexical functions $MLF_{I,[\sigma]}$, $MLF_{II,[\sigma]}$, $MLF_{III,[\sigma]}$, and $MLF_{IV,[\sigma]}$ in succession to $[_{v}stu]$. In accordance with the Maximal Subset Override, $MLF_{I,[\sigma]}$, $MLF_{II,[\sigma]}$, and $MLF_{III,[\sigma]}$ are evaluated as $MLR_{(35a)}$, $MLR_{(35b.i)}$, and $MLR_{(35c.i)}$, respectively; in accordance with the Identity Function Default, $MLF_{IV,[\sigma]}$ is evaluated as the identity function. $PF_{[\sigma]}([_{v}stu])$ therefore has the value *tuṣṭáva*, as in 37.

(37) Where $[\sigma]$ = [SYS:perf, PRET:no, MOOD:indic, PER:1, NUM:sg, VCE:act],

$PF_{[\sigma]}([_{v}stu])$

$= MLF_{IV,[\sigma]}(MLF_{III,[\sigma]}(MLF_{II,[\sigma]}(MLF_{I,[\sigma]}([_{v}stu]))))$ [by 34]

$= MLR_{(35c.i)}(MLR_{(35b.i)}(MLR_{(35a)}([_{v}stu])))$ [by 14, 15]

$= [_{v}[_{v}tuṣṭáv]a]$ 'I have praised'

The 3sg simple perfect active form of *stu-* is the value of $PF_{[\sigma]}([_{v}stu])$, where

[18] As formulated, rules 35c.iii and 35c.v apply not only in simple perfects, but also in present and future indicatives.

[19] One might suppose that 35d/MLF_{IV} could be dispensed with by treating the terminations introduced by 35c.iii,v as inherently accented; these terminations are, however, unaccented in contexts other than the perfect (as in PRES IND *bháv-e* 'I am', *bháva-se* 'you (sg.) are').

[σ] is the set of feature specifications in 38. By 34, the value of $PF_{[\sigma]}([_{v}stu])$ is the result of applying the morpholexical functions $MLF_{I,[\sigma]}$, $MLF_{II,[\sigma]}$, $MLF_{III,[\sigma]}$, and $MLF_{IV,[\sigma]}$ in succession to $[_{v}stu]$. By the referral rule schema 36, $MLF_{I,[\sigma]}$, $MLF_{III,[\sigma]}$, and $MLF_{IV,[\sigma]}$ are evaluated as $MLF_{I,[\sigma]/[PER:1]}$, $MLF_{III,[\sigma]/[PER:1]}$, and $MLF_{IV,[\sigma]/[PER:1]}$, respectively; but by the Maximal Subset Override, the morpholexical rule $MLR_{(35b.ii)}$ overrides 36 in determining the value of $MLF_{II,[\sigma]}$. Consequently, $PF_{[\sigma]}([_{v}stu])$ in this case has the value *tuṣṭáva*, as in 38.

(38) Where [σ] = [SYS:perf, PRET:no, MOOD:indic, PER:3, NUM:sg, VCE:act],

$PF_{[\sigma]}([_{v}stu])$

$= MLF_{IV,[\sigma]}(MLF_{III,[\sigma]}(MLF_{II,[\sigma]}(MLF_{I,[\sigma]}([_{v}stu]))))$ [by 34]

$= MLF_{IV,[\sigma]/[PER:1]}(MLF_{III,[\sigma]/[PER:1]}(MLR_{(35b.ii)}(MLF_{I,[\sigma]/[PER:1]}([_{v}stu]))))$ [by 14, 36]

$= MLR_{(35c.i)}(MLR_{(35b.ii)}(MLR_{(35a)}([_{v}stu])))$ [by 14, 15]

$= [_{v}[_{v}tuṣṭáv]a]$'s/he has praised'

Thus, in the definition of Vedic 3sg PERF ACT *tuṣṭáva* a rule of referral determines the value of three of the relevant morpholexical functions, while an overriding morpholexical rule determines that of the fourth; in this way, the partial syncretism of *tuṣṭáva* with *tuṣṭáva* 'I have praised' is accounted for.[20] No similar account is afforded by the broad approach.

5. THE DIRECTION OF REFERRALS. Rules of referral are inherently DIRECTIONAL, predicting the morphology of one class of expressions from that of another. An important question, therefore, is: how can the direction of referral be decided in a given instance? Given any rule of referral '$RR_{n,[\tau]}([\sigma 1]) = [\sigma 2]$', why is the class of expressions specified [σ1] assumed to pattern after the class of expressions specified [σ2] rather than the other way around? In the examples discussed above, various criteria can be discerned. In the case of the 2sg past-tense syncretism in Macedonian (§3.2), the assumption that 2sg past-tense forms pattern after 3sg past-tense forms makes it possible to state a maximally simple morpholexical rule for the slot II past-tense suffix *-v* (according to which *-v* is restricted to the nonthird persons, as in 19b); and although the slot III morphology neither favors nor disfavors the assumption that the 3sg past-tense forms are primary, the simplest referral rule schema describing the Macedonian syncretism is one in which the same directionality is assumed for all three slots, as in 20. In the case of the Sanskrit ablative syncretisms (§3.3), the fact that it is the ablative (rather than the dative or the genitive) that participates in syncretisms in all three numbers makes it plausible to assume that the morphology of ablative forms in general patterns after that of other forms (the sole exception being in the singular of *a*-stems). Probably the least disputable

[20] The fact that stem grade doesn't participate in the *tuṣṭáva/tuṣṭáva* syncretism does not follow from any general property of stem gradation; on the contrary, there are other syncretisms in Sanskrit in which stem grade does participate, such as those given in 5, 6, and 8.

evidence for the directionality of referrals involves those syncretisms that Carstairs (1984, 1987) terms TAKE-OVERS:[21] where [τ] and [τ′] are sets of morphosyntactic feature specifications such that [τ] takes over [τ′] in some context, then the rule of referral encoding this take-over causes the class of expressions specified [τ′] to pattern after the class of expressions specified [τ]. An example of this sort is that of the Vedic simple perfects discussed in §4: because *-e* appears as a 1sg middle suffix both in the perfect and elsewhere (e.g. the present indicative) but appears as a 3sg middle suffix in the perfect only, it's clear that 3sg simple perfects pattern after their 1sg counterparts.

This property of take-overs does, however, raise a question: could there be cases in which [τ] and [τ′] are syncretized sets of morphosyntactic feature specifications such that [τ] takes over [τ′] in some instances but [τ′] takes over [τ] in others? Consider again the Macedonian rule of referral in 39 [= 2]:

(39) In the past tenses, the second person singular has the same form as the third person singular.

By this rule, the specification 'second person singular' is in some sense subordinate to the specification 'third person singular', since (in the past tenses) the realization of the former simply diverts to that of the latter. But could there be a language in which, for example, the 2sg diverted to the 3sg in some instances, but the 3sg instead diverted to the 2sg in others? That is, are rules of referral always unidirectional, or can they instead apply bidirectionally?

I shall argue that some rules of referral do, in a sense, apply bidirectionally. Consider the Old Icelandic declensional paradigms in Table 7. As these examples indicate, Old Icelandic nouns fall into three classes according to the way they inflect in the accusative singular and the dative singular. In Class B the accusative and dative singular are distinguished. For example, in feminine Class B nouns, the dative is marked with the suffix *-o*, while the accusative lacks any case suffix (cf. Table 7); in other Class B declensions, the DAT sg is distinguished by the suffix *-e* or by modification of the stem vowel, or both. In Classes A and C, however, the accusative and the dative are syncretized in the singular. For nouns in Class A, the DAT sg form is identical to the suffixless ACC sg form; for nouns in Class C (generally compound proper nouns), the ACC sg form is identical to the DAT sg form suffixed with *-o*.

These facts suggest that the accusative singular/dative singular referral in Old Icelandic is bidirectional: for nouns in Class A, the DAT sg takes on the form of the ACC sg, while for nouns in Class C, the ACC sg takes on the form of the DAT sg. In order to account for this bidirectionality, one could simply assume the existence of two distinct rules of referral, as in 40.[22] This would

[21] Carstairs' definition (1987:117):

'A systematic inflexional homonymy is a TAKE-OVER if it involves the realisation of two or more morphosyntactic properties (A and B) in some context by an inflexion which elsewhere realises only one of these properties (B). In such circumstances we can say that B takes over A, or that there is a take-over of A by B.'

[22] Halle (1992:41) proposes a solution of this sort for a comparable instance of bidirectionality in Latvian, in which the NOM sg takes on the form of the GEN sg in some contexts, while the GEN sg takes on the form of the NOM sg in other contexts.

	SINGULAR	PLURAL
CLASS A: *skǫr* 'hair (of the head)'		
NOM	*skǫr*	*skarar*
ACC	*skǫr*	*skarar*
GEN	*skarar*	*skara*
DAT	*skǫr*	*skǫrom*
CLASS B: *kerling* 'old woman'		
NOM	*kerling*	*kerlingar*
ACC	*kerling*	*kerlingar*
GEN	*kerlingar*	*kerlinga*
DAT	*kerlingo*	*kerlingom*
CLASS C: *Ingebiǫrg* [woman's name]		
NOM	*Ingebiǫrg*	—
ACC	*Ingebiǫrgo*	—
GEN	*Ingebiargar*	—
DAT	*Ingebiǫrgo*	—

TABLE 7. Three declensional paradigms in Old Icelandic (Heusler 1962:64f., Noreen 1923:260ff., Gordon 1957:285).

not be a very satisfying solution, however; because it would represent the complementarity of the two rules as sheer coincidence, it would fail to capture the fact that they embody what is fundamentally the same syncretism.

(40) a. $RR_{I,[CASE:dat,\ NUM:sg]}([\sigma]) = [\sigma]/[CASE:acc]$ CLASS: A
b. $RR_{I,[CASE:acc,\ NUM:sg]}([\sigma]) = [\sigma]/[CASE:dat]$ CLASS: C

A superior alternative is to assume that every rule of referral $RR_{n,[\sigma]}$ has a DOMAIN (represented $DOMAIN_{RR_{n,[\sigma]}}$) such that $CLASS_{RR_{n,[\sigma]}}$ is a subset of $DOMAIN_{RR_{n,[\sigma]}}$. On this assumption, the bidirectionality of the Old Icelandic accusative singular/dative singular referral can then be attributed to the Bidirectional Referral Principle in 41.

(41) BIDIRECTIONAL REFERRAL PRINCIPLE:
Given any rule of referral $RR_{n,[\sigma]}$, the inverse of $RR_{n,[\sigma]}$ is a rule of referral restricted to $DOMAIN_{RR_{n,[\sigma]}}$ minus $CLASS_{RR_{n,[\sigma]}}$.

To see how this principle works, consider the analysis sketched in 42.

(42) Rules and functions for a fragment of Old Icelandic morphology:
a. $MLR_{I,[CASE:dat,\ NUM:sg,\ GEN:fem]}([_N x]) = [_N[_N x]o]$ CLASS: B ∪ C
b. $RR_{I,[CASE:dat,\ NUM:sg]}([\sigma]) = [\sigma]/[CASE:acc]$ CLASS: A ∪ B
DOMAIN: Nouns
c. Where $[_N x] \in [GEN:\gamma]$,
$PF_{[CASE:\alpha,\ NUM:\beta]}([_N x]) = MLF_{I,[CASE:\alpha,\ NUM:\beta,\ GEN:\gamma]}([_N x])$

Ex. 42a is the morpholexical rule which spells out the DAT sg suffix *-o* in feminine nouns belonging to Classes B and C; 42b is the rule of referral which causes the DAT sg form of a noun belonging to Class A to take on the form of its ACC sg; and 42c is the paradigm function schema which determines the case-forms of nouns. The rule of referral in 42b is restricted to the class A ∪ B within the domain of nouns. By the Bidirectional Referral Principle, the inverse of 42b is therefore also a rule of referral, one restricted to the complement of A ∪ B within the domain of nouns (i.e. to class C). This inverse rule of referral

could be formulated as in 43, but given 41 and 42b, 43 would not have to be overtly stipulated in the morphology of Old Icelandic.

(43) $RR_{I,[CASE:acc,\ NUM:sg]}([\sigma]) = [\sigma]/[CASE:dat]$ CLASS: C
DOMAIN: Nouns

On this analysis, the ACC sg form of a class A noun such as *skǫr* 'hair' or a class B noun such as *kerling* 'old woman' is determined by the definition of the paradigm function $PF_{[CASE:acc,\ NUM:sg]}$ in combination with the Identity Function Default, as in 44a and 45a.[23] By the rule of referral in 42b, the DAT sg form of *skǫr* is identical to its ACC sg form, as in 44b; but by the Maximal Subset Override, the morpholexical rule 42a overrides 42b in determining the DAT sg form of *kerling*, which is therefore distinct from the corresponding ACC sg form, as in 45b. Because *Ingebiǫrg* belongs to class C, its DAT sg form is determined by the definition of the paradigm function $PF_{[CASE:dat,\ NUM:sg]}$ in combination with the morpholexical rule 42a, as in 46b; and for this same reason, its ACC sg is predicted to be identical to its DAT sg by the inverse rule of referral in 43, as in 46a.[24]

(44) a. $PF_{[CASE:acc,\ NUM:sg]}([_N skǫr])$
$= MLF_{I,[CASE:acc,\ NUM:sg,\ GEN:fem]}([_N skǫr])$ [by 42c]
$= [_N skǫr]$ [by 15]

b. $PF_{[CASE:dat,\ NUM:sg]}([_N skǫr])$
$= MLF_{I,[CASE:dat,\ NUM:sg,\ GEN:fem]}([_N skǫr])$ [by 42c]
$= MLF_{I,[CASE:acc,\ NUM:sg,\ GEN:fem]}([_N skǫr])$ [by 42b]
$= [_N skǫr]$ [by 15]

(45) a. $PF_{[CASE:acc,\ NUM:sg]}([_N kerling])$
$= MLF_{I,[CASE:acc,\ NUM:sg,\ GEN:fem]}([_N kerling])$ [by 42c]
$= [_N kerling]$ [by 15]

b. $PF_{[CASE:dat,\ NUM:sg]}([_N kerling])$
$= MLF_{I,[CASE:dat,\ NUM:g,\ GEN:fem]}([_N kerling])$ [by 42c]
$= MLR_{(42a)}([_N kerling])$ [by 14]
$= [_N[_N kerling]o]$

(46) a. $PF_{[CASE:acc,\ NUM:sg]}([_N Ingebiǫrg])$
$= MLF_{I,[CASE:acc,\ NUM:sg,\ GEN:fem]}([_N Ingebiǫrg])$ [by 42c]
$= MLF_{I,[CASE:dat,\ NUM:sg,\ GEN:fem]}([_N Ingebiǫrg])$ [by 43]
$= MLR_{(42a)}([_N Ingebiǫrg])$ [by 14]
$= [_N[_N Ingebiǫrg]o]$

b. $PF_{[CASE:dat,\ NUM:sg]}([_N Ingebiǫrg])$
$= MLF_{I,[CASE:dt,\ NUM:sg,\ GEN:fem]}([_N Ingebiǫrg])$ [by 42c]
$= MLR_{(42a)}([_N Ingebiǫrg])$ [by 14]
$= [_N[_N Ingebiǫrg]o]$

This analysis accounts for the bidirectionality of the accusative singular/dative singular referral in Old Icelandic, and does so in a way that explains the complementarity of 42b and 43. But what are the implications of 41 for the

[23] For expository purposes, I assume that *skǫr-* and *Ingebiǫrg-* (rather than *skar-* and *Ingebiarg-*) are—synchronically—the bases of the paradigms in Table 7A and 7C; this assumption is not crucial to the point being made.

[24] The rule of referral in 42b could be restricted to Class A if its domain were correspondingly restricted to A ∪ C.

other rules of referral proposed earlier, such as the Macedonian referral in 39? The Bidirectional Referral Principle can be assumed to be applicable in 39 as well, though vacuously. In the formulation of 39 given in 20, the class of verbs to which the rule is restricted isn't indicated, because the rule is a default pertaining to ALL verbs; that is, $\text{CLASS}_{\text{RR}_n[\text{PAST:yes, PER:2, NUM:sg}]}$ is simply the set of verbs. Assuming that $\text{DOMAIN}_{\text{RR}_n[\text{PAST:yes, PER:2, NUM:sg}]}$ is likewise just the set of verbs, the inverse of 20 isn't applicable to anything. (Analogous remarks hold for the Sanskrit referral rule schemata in 28 and the Vedic schema 36.) The comparative rarity of nonvacuously bidirectional referrals suggests that, in the default case, the class of expressions to which a rule of referral is restricted is identical to its domain.

Before leaving the question of directionality, one matter remains to be addressed—that of syncretisms which are not discernibly directional. An instance of this sort is the syncretism of the genitive and locative dual in all Sanskrit declensions: given that the genitive and locative are never syncretized in the singular or the plural and that the suffix *-os* appears in all genitive/locative dual forms (pronominal clitics aside) and nowhere else, there are no good grounds for treating *-os* as basically genitive or basically locative. In this instance, the postulation of a rule of referral would wrongly imply a directional relation. Instead, this syncretism might be attributed to a language-specific stipulation that the genitive dual and the locative dual have identical exponence. This stipulation would function as a kind of well-formedness condition on morpholexical rules, requiring any rule realizing the specifications [CASE:gen, NUM:du] to realize [CASE:loc, NUM:du] in the same way (and vice versa); for instance, the morpholexical rule of *-os* suffixation (= rule 27c.ii in the fragment of Sanskrit morphology in §3.3) would have to be treated as a schema realizing [CASE:α, NUM:du], where α = gen or loc (as would the stem modification rule 27a.iii). On this view, nondirectional syncretisms in general arise from morpholexical rules making direct reference to a disjunction of feature values (cf. Zwicky 1990:223). See also Zwicky (1985:374) for another example of this sort.

6. SUCCESSIVE REFERRALS AND CODETERMINANT REFERRALS. In the instances of syncretism discussed in §§3–5, at most one rule of referral enters into the evaluation of a given morpholexical function. There are, however, two types of situations in which the evaluation of a morpholexical function depends on more than one rule of referral. On the one hand, there are SUCCESSIVE REFERRALS such that one referral feeds into another in the evaluation of some morpholexical function; on the other hand, there are CODETERMINANT REFERRALS, in which the value of a morpholexical function seems to be simultaneously determined by two (or more) rules of referral. In this section I show that successive referrals are directly accommodated by the framework set forth in §3, and that codeterminant referrals are likewise accommodated if the Maximal Subset Override is supplemented by the REFERRAL COMPOSITION PRINCIPLE discussed below.

Consider an example of successive referrals. In Russian, the accusative form

of an inanimate noun defaults to its nominative form; complementarily, the accusative form of an animate noun defaults to its genitive form. These defaults are overridden by more specific rules in the accusative singular of feminine and neuter nouns but are operative in the accusative singular of masculine nouns and in the accusative plural of all three genders; cf. Tables 8 and 9. In the rule format proposed in §3.1, these two instances of syncretism might be

	SINGULAR			PLURAL	
	NOM	ACC	GEN	NOM/ACC	GEN
MASCULINE					
1st declension					
Type A					
'factory'	*zavód*	*zavód*	*zavód-a*	*zavód-y*	*zavód-ov*
'table'	*stol*	*stol*	*stol-á*	*stol-ý*	*stol-óv*
'circle'	*krug*	*krug*	*krúg-a*	*krug-í*	*krug-óv*
'market'	*rýnok*	*rýnok*	*rýnk-a*	*rýnk-i*	*rýnk-ov*
'shoe'	*botínok*	*botínok*	*botínk-a*	*botínk-i*	*botínok*
'museum'	*muzéj*	*muzéj*	*muzéj-a*	*muzé-i*	*muzé-ev*
'briefcase'	*portfél'*	*portfél'*	*portfélj-a*	*portfél-i*	*portfél-ej*
'ruble'	*rubl'*	*rubl'*	*rublj-á*	*rubl-í*	*rubl-éj*
Type B					
'house'	*dom*	*dom*	*dóm-a*	*dom-á*	*dom-óv*
'chair'	*stul*	*stul*	*stúl-a*	*stúl'j-a*	*stúl'j-ev*
Exceptional declension					
'way'	*put'*	*put'*	*put-í*	*put-í*	*put-éj*
FEMININE					
2nd declension					
'map'	*kárt-a*	*kárt-u*	*kárt-y*	*kárt-y*	*kart*
'melon'	*dýnj-a*	*dýnj-u*	*dýn-i*	*dýn-i*	*dyn'*
'war'	*vojn-á*	*vojn-ú*	*vojn-ý*	*vójn-y*	*vojn*
'hand, arm'	*ruk-á*	*rúk-u*	*ruk-í*	*rúk-i*	*ruk*
'lip'	*gub-á*	*gub-ú*	*gub-ý*	*gúb-y*	*gub*
'family'	*sem'j-á*	*sem'j-ú*	*sem'-í*	*sém'-i*	*sem-éj*
'history'	*istórij-a*	*istórij-u*	*istóri-i*	*istóri-i*	*istórij*
3rd declension					
'notebook'	*tetrád'*	*tetrád'*	*tetrád-i*	*tetrád-i*	*tetrád-ej*
'door'	*dver'*	*dver'*	*dvér-i*	*dvér-i*	*dver-éj*
NEUTER					
1st declension					
Type C					
'swamp'	*bolót-o*	*bolót-o*	*bolót-a*	*bolót-a*	*bolót*
'place'	*mést-o*	*mést-o*	*mést-a*	*mest-á*	*mest*
'window'	*okn-ó*	*okn-ó*	*okn-á*	*ókn-a*	*ókon*
'wing'	*kryl-ó*	*kryl-ó*	*kryl-á*	*kryl'j-a*	*kryl'-ev*
'building'	*zdáni-e*	*zdáni-e*	*zdánij-a*	*zdánij-a*	*zdánij*
'sea'	*mór-e*	*mór-e*	*mórj-a*	*morj-á*	*mor-éj*
Type D					
'apple'	*jáblok-o*	*jáblok-o*	*jáblok-a*	*jáblok-i*	*jáblok*
'shoulder'	*pleč-ó*	*pleč-ó*	*pleč-á*	*pléč-i*	*pleč*
Exceptional declension					
'time'	*vrémj-a*	*vrémj-a*	*vrémen-i*	*vremen-á*	*vremën*

TABLE 8. Nominative, accusative, and genitive forms of some inanimate Russian nouns.

	SINGULAR			PLURAL	
	NOM	ACC	GEN	NOM	ACC/GEN
MASCULINE					
1st declension					
Type A					
'student'	*studént*	*studént-a*	*studént-a*	*studént-y*	*studént-ov*
'hero'	*gerój*	*gerój-a*	*gerój-a*	*geró-i*	*geró-ev*
'genius'	*génij*	*génij-a*	*génij-a*	*géni-i*	*géni-ev*
'father-in-law'	*test'*	*téstj-a*	*téstj-a*	*tést-i*	*tést-ej*
Type B					
'doctor'	*dóktor*	*dóktor-a*	*dóktor-a*	*doktor-á*	*doktor-óv*
'kitten'	*kotënok*	*kotënk-a*	*kotënk-a*	*kotját-a*	*kotját*
'citizen'	*graždanín*	*graždanín-a*	*graždanín-a*	*gráždan-e*	*gráždan*
'husband'	*muž*	*múž-a*	*múž-a*	*muž'j-á*	*muž-éj*
2nd declension					
'grandfather'	*dédušk-a*	*dédušk-u*	*dédušk-i*	*dédušk-i*	*dédušek*
FEMININE					
2nd declension					
'woman'	*žénščin-a*	*žénščin-u*	*žénščin-y*	*žénščin-y*	*žénščin*
'nurse'	*njánj-a*	*njánj-u*	*njún-i*	*njún-i*	*njan'*
'squirrel'	*bélk-a*	*bélk-u*	*bélk-i*	*bélk-i*	*bélok*
'female guest'	*gést'j-a*	*gést'j-u*	*gést'-i*	*gést'-i*	*géstij*
3rd declension					
'mother-in-law'	*svekróv'*	*svekróv'*	*svekróv-i*	*svekróv-i*	*svekróv-ej*
'mother'	*mat'*	*mat'*	*máter-i*	*máter-i*	*mater-éj*

TABLE 9. Nominative, accusative, and genitive forms of some animate Russian nouns.

represented as in 47 and 48:

(47) $RR_{n,[CASE:acc]}([\sigma]) = [\sigma]/[CASE:nom]$ CLASS: inanimate

(48) $RR_{n,[CASE:acc]}([\sigma]) = [\sigma]/[CASE:gen]$ CLASS: animate

A third instance of syncretism is also discernible in Tables 8 and 9. To see this, consider first the morpholexical rules which introduce the GEN sg suffix *-a* and the NOM pl suffix *-y* (including its phonologically conditioned alternant *-i*):

(49) $MLR_{I,[CASE:gen,\ NUM:sg]}([_N x]) = [_N[_N x]a]$

(50) $MLR_{I,[CASE:nom,\ NUM:pl]}([_N x]) = [_N[_N x]y]$

I assume that these are the default rules for GEN sg and NOM pl nouns in Russian. The genitive singular suffix *-a* does not, however, appear in the second and third declensions; and while the nominative plural suffix *-y/-i* appears generally in feminine paradigms, it is excluded from some masculine paradigms (those of 'Type B' in Tables 8 and 9) and from most neuter paradigms (the few exceptions being those of 'Type D'). That is, only certain nouns form both their GEN sg in *-a* and their NOM pl in *-y/-i*, namely first-declension masculines of Type A and first-declension neuters of Type D. Other nouns generally exhibit a syncretism between the GEN sg and the NOM pl: second- and third-declension nouns (the vast majority of which are feminine) have *-y/-i* in both the GEN sg and the NOM pl, and unexceptional neuter nouns (i.e. those of Type C) generally have *-a* in both the GEN sg and the NOM pl, as do the exceptional masculines

of Type B. This might be taken as evidence that the GEN sg and NOM pl affixes participate in a bidirectional referral. Indeed, unless one makes this assumption, the extreme paucity of paradigms with GEN sg *-y/-i* and NOM pl *-a* becomes rather difficult to account for, given the abundance of paradigms having either (i) GEN sg *-a* and NOM pl *-y/-i*, (ii) GEN sg *-a* and NOM pl *-a*, or (iii) GEN sg *-y/-i* and NOM pl *-y/-i*.

The proposed referral can be defined as in 51.

(51) $RR_{I,[CASE:gen,\ NUM:sg]}([\sigma])$ = [σ]/[CASE:nom, NUM:pl]
CLASS: [DECLENSION:2] ∪ [DECLENSION:3]
DOMAIN: [DECLENSION:2] ∪ [DECLENSION:3]
∪ Type B masculines ∪ Type C neuters

By the Bidirectional Referral Principle, the existence of 51 entails that of the derivative rule of referral in 52:[25]

(52) $RR_{I,[CASE:nom,\ NUM:pl]}([\sigma])$ = [σ]/[CASE:gen, NUM:sg]
CLASS: Type B masculines ∪ Type C neuters

Unlike the accusative syncretisms defined by 47 and 48, the syncretism characterized by 51 (and 52) is not a whole-word syncretism. This is obviously so in the case of heteroclitic paradigms (e.g. that of 'kitten', GEN sg *kotënk-a*, NOM pl *kotját-a*); more broadly, the NOM pl and GEN sg forms participating in this syncretism may differ accentually (e.g. 'hand/arm': GEN sg *ruk-í*, NOM pl *rúk-i*; 'place': GEN sg *mést-a*, NOM pl *mest-á*). The rules of stress placement for Russian nouns are separate from those which introduce case endings; the same affixes can show up stressed in one paradigm and unstressed in another (cf. e.g. the forms of *zavód* 'factory' and *stol* 'table' in Table 8). I therefore assume that Russian case endings are spelled out by one class of morpholexical functions (of the form $MLF_{I,[CASE:\alpha,\ NUM:\beta,\ GEN:\gamma]}$) and that stress alternations are determined by another (of the form $MLF_{II,[CASE:\alpha,\ NUM:\beta,\ GEN:\gamma]}$). For instance, I assume that the evaluation of $PF_{[CASE:gen,\ NUM:sg]}([_N ruk])$ involves the application of two distinct morpholexical functions, the first of which suffixes *-y/-i* and the second of which marks the resulting form for end stress. Of the two classes of morpholexical functions, only those of the form $MLF_{I,[CASE:\alpha,\ NUM:\beta,\ GEN:\gamma]}$ are within the compass of the rules in 51 and 52.

Given the proposed formulations of the rules of referral in 47, 48, 51, and 52, the Maximal Subset Override predicts that 47 and 52 should participate successively in the evaluation of $MLF_{I,[CASE:acc,\ NUM:pl,\ GEN:neut]}([_N bolot])$ since *bolot-* 'swamp' is a Type C inanimate neuter; that is, the accusative plural case ending for *bolot-* ultimately defaults to that of GEN sg *bolót-a*, as in 53.

(53) $MLF_{I,[CASE:acc,\ NUM:pl,\ GEN:neut]}([_N bolot])$
= $MLF_{I,[CASE:nom,\ NUM:pl,\ GEN:neut]}([_N bolot])$ [by 14, 47]
= $MLF_{I,[CASE:gen,\ NUM:sg,\ GEN:neut]}([_N bolot])$ [by 14, 52]
= $MLR_{(49)}([_N bolot])$ [by 14]
= $[_N[_N bolot]a]$ 'swamps (ACC pl)'

[25] Like any rule of referral, 52 is a default which may be overridden by more specific rules, e.g. the morpholexical rule of *-e* suffixation by which NOM pl *grážd-an-e* 'citizens' is formed.

As this example shows, the assumptions set forth in §3.1 predict the desired interaction between rules of referral in instances of successive referrals.

The situation is slightly more complicated in the case of codeterminant referrals, in which the value of some morpholexical function seems to be simultaneously determined by two or more rules of referral, neither of which overrides the other. Zwicky (1985:380) gives two examples of such codeterminant pairs of rules of referral. For instance, he proposes a pair of rules of referral for German which, in the rule format assumed here, may be represented as in 54:

(54) a. $RR_{1,[CASE:acc]}([\sigma]) = [\sigma]/[CASE:nom]$ CLASS: Nounal[26]
b. $RR_{1,[NUM:pl]}([\sigma]) = [\sigma]/[GEN:fem, NUM:sg]$ CLASS: Nounal

Rule 54a causes the case-marking of accusative nouns, adjectives, and determiners to default to that of their nominative counterparts; 54b causes the case-marking of plural nouns, adjectives, and determiners to default to that of feminine singular forms. As defaults, both may be overridden. Nevertheless, circumstances arise in which 54a and 54b seem to operate jointly to determine the value of a morpholexical function. For example, neither overrides the other in determining the value of $MLF_{1,[CASE:acc,\ NUM:pl,\ GEN:masc]}([_A gut])$; instead, 54a and 54b together cause the masculine ACC pl form of *gut* to default to that of FEM NOM sg *gute,* supplied by the morpholexical rule in 55.

(55) $MLR_{1,[CASE:nom,\ NUM:sg,\ GEN:fem]}([_X x]) = [_X[_X x]e]$
CLASS: Adjectival[27]

This phenomenon of codeterminant referrals is accommodated by the network of assumptions developed in §3.1 if the following additional principle is adopted:

(56) REFERRAL COMPOSITION PRINCIPLE:
Given two rules of referral $RR_{n,[\tau 1]}$ and $RR_{n,[\tau 2]}$ neither of which overrides the other: if $[\tau 1] \cup [\tau 2]$ is an internally consistent set of feature specifications and $CLASS_{RR_{n,[\tau 1]}} \cap CLASS_{RR_{n,[\tau 2]}}$ is nonnull, then there is a rule of referral $RR_{n,[\tau 1] \cup [\tau 2]}$ such that $RR_{n,[\tau 1] \cup [\tau 2]}([\sigma]) = RR_{n,[\tau 1]}(RR_{n,[\tau 2]}([\sigma]))$.

Informally, 56 says that the composite of two mutually nonoverriding rules of referral is itself a rule of referral. By 56, the existence of the rules of referral 54a and 54b entails that of the composite rule of referral 57.

(57) $RR_{1,[CASE:acc,\ NUM:pl]}([\sigma]) = [\sigma]/[CASE:nom, NUM:sg, GEN:fem]$
CLASS: Nounal

This composite rule overrides both 54a and 54b in determining the value of $MLF_{1,[CASE:acc,\ NUM:pl,\ GEN:masc]}([_A gut])$, which is therefore evaluated in accordance with the Maximal Subset Override as in 58. That is, although the value of $MLF_{1,[CASE:acc,\ NUM:pl,\ GEN:masc]}([_A gut])$ seems to be simultaneously determined by 54a and 54b, it is, technically speaking, determined neither by 54a nor by 54b, but by their composite.

[26] Zwicky's term 'Nounal' encompasses nouns, adjectives, and determiners.

[27] Zwicky's term 'Adjectival' encompasses adjectives and determiners.

(58) $MLF_{I,[CASE:acc,\ NUM:pl,\ GEN:masc]}([_A gut])$
$= MLF_{I,[CASE:nom,\ NUM:sg,\ GEN:fem]}([_A gut])$ [by 14, 57]
$= MLR_{(55)}([_A gut])$ [by 14]
$= [_A[_A gut]e]$

The rules of referral in 54a and 54b are 'commutative' in the sense that the composite of 54a with 54b is the same function as the composite of 54b with 54a; one can, however, imagine pairs of rules which would not be commutative, e.g. the hypothetical pair in 59.

(59) a. $RR_{I,[CASE:acc]}([\sigma]) = [\sigma]/[CASE:nom]$ CLASS: Nouns
b. $RR_{I,[NUM:pl]}([\sigma]) = [\sigma]/[CASE:acc, NUM:sg]$ CLASS: Nouns

Given 59, principle 56 would introduce two distinct composite functions neither of which would override the other:

(60) a. $RR1_{I,[CASE:acc,\ NUM:pl]}([\sigma]) = [\sigma]/[CASE:acc, NUM:sg]$
CLASS: Nouns
b. $RR2_{I,[CASE:acc,\ NUM:pl]}([\sigma]) = [\sigma]/[CASE:nom, NUM:sg]$
CLASS: Nouns

If such instances actually occur, then some means of deciding between the competing composites predicted by 56 would have to be found. Potentially this could simply amount to a language-specific stipulation (e.g. 'the composite of $RR_{I,[NUM:pl]}$ with $RR_{I,[CASE:acc]}$ is ungrammatical', in effect a restriction on the order of application of $RR_{I,[CASE:acc]}$ and $RR_{I,[NUM:pl]}$). But I don't know of any real instances comparable to 59a–b; perhaps the only pairs of rules of referral that ever actually satisfy the conditions in 56 are commutative pairs such as 54a–b.

7. CONCLUSIONS. The theory of rules of referral proposed here is founded on one main idea: that rules of referral, like morpholexical rules, serve as clauses in the definition of morpholexical functions. Together with independently motivated principles of Paradigm Function Morphology, this assumption has three direct consequences. First, rules of referral compete with morpholexical rules (and with each other) to determine the value of a given morpholexical function, in accordance with the Maximal Subset Override. Second, rules of referral have as their compass the individual steps by which a fully inflected word is built up from the root of its paradigm (so that not all syncretisms are whole-word syncretisms). And third, two or more rules of referral may apply successively in the evaluation of a given morpholexical function. Two additional principles—the Bidirectional Referral Principle and the Referral Composition Principle—make it possible to deduce inverse rules of referral and composite rules of referral from more basic rules; given these two principles, the proposed theory automatically accounts both for bidirectional referrals and for codeterminant referrals.

In the foregoing discussion, I have not focussed on the goal of restricting the pretheoretical notion of what constitutes a possible syncretism in human language (although that is a task which is certainly important and urgent). Nevertheless, the proposed theory imposes very strong restrictions on the range of possible morphological rule systems. Because it presumes that rules

of referral and morpholexical rules are fundamentally alike (in that both serve as clauses in the definition of morpholexical functions), it entails that their interaction is regulated by the Maximal Subset Override ('the Elsewhere Condition'). In this respect the proposed theory is, for example, inherently more restrictive than any morpheme-based theory of inflection. Morpheme-based theories lack morpholexical rules ('rules of exponence') and therefore lack any simple way to attribute overrides such as those discussed in §2.2.1–2 to the Elsewhere Condition; instead, a morpheme-based theory would seemingly have to engineer all such override relations on a language-particular basis.

Perhaps language-particular stipulations regarding the interactions of rules of referral can be wholly dispensed with in the theory proposed here. In the examples that I have discussed, all such interactions are fully determined by three universal principles, and I know of no instances which actually make it necessary to recur to additional, language-specific restrictions. An attractive and plausible hypothesis, therefore, is that the Maximal Subset Override, the Bidirectional Referral Principle, and the Referral Composition Principle jointly constitute an exhaustive, universally valid characterization of the role which rules of referral play in a language's morphology.

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