Syncretism without paradigms: Remarks on Williams 1981, 1994

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Plank (1991) begins with the observation that "[t]he earliest extant grammatical texts are paradigms" (p. 161). The long linguistic and philological traditions have established a wealth of knowledge about the properties of paradigms, notably regarding the issue of syncretism, but one fundamental question has not been definitively answered, namely (1):

(1) Does knowledge of language (grammar) include knowledge (memorization) of paradigms themselves or just of the pieces that constitute paradigms and rules for generating them?

Consider, by way of a simple, illustrative example, the (partial) paradigm of a regular English verb given in (2):

(2)

	Present		*Past*	
	Singular	*Plural*	*Singular*	*Plural*
1 psn	play-ϕ	play-ϕ	play-[d]	play-[d]
2 psn	play-ϕ	play-ϕ	play-[d]	play-[d]
3 psn	play-[z]	play-ϕ	play-[d]	play-[d]

As is well known, the information contained in this paradigmatic representation can be generated from the set of morpho-syntactic features indicated (in this case, two tenses, three persons, two numbers), along with a disjunctively ordered list of morpheme realization rules, or equivalently, competing VOCABULARY ITEMS in the terminology of Distributed Morphology (Halle & Marantz 1993). That is, given the same feature set and in abstracting away from the usual phonological considerations – necessary on either approach – (3) will derive (2).

(3) Vocabulary Items

-d ⇔ past
-z ⇔ 3sg
-ϕ = default/elsewhere

The question in (1) thus asks whether an English speaker's knowledge of their language – their grammar – is more accurately represented by (2) or (3). This question constitutes a major divide between classes of theories of morphology. On the one hand are *paradigm-based* theories, which assume that paradigmatic structures such as (2), in addition to their contents, are part of the grammar;

Geert Booij and Jaap van Marle (eds), Yearbook of Morphology 2001, 53–85.

Williams (1994) argues explicitly for this position. On the other hand are *vocabulary-(item)-based* theories, which maintain that (3) is the best representation of the grammar, and that paradigms are epiphenomenal, derived constructs.[1]

In this article, I seek to counter one set of arguments in favour of paradigm-based theories over vocabulary-item-based alternatives. Specifically, I will examine the arguments given in Williams (1994) regarding patterns of syncretism and his conclusion that the paradigm is "a real object, and not the epiphenomenal product of various rules" (Williams 1994:22). I will argue first that Williams provides a valid and important critique of naïve vocabulary-item-based theories, but that this critique does not lead inescapably to the conclusion he draws. In particular, the argument from syncretism ultimately does not distinguish between the two classes of theories. The patterns of syncretism that Williams identifies may motivate an enrichment to naïve vocabulary-item-based theories (specifically, the kind of feature-manipulation device instantiated by Impoverishment rules in Distributed Morphology, cf. Bonet 1991, 1995), but the patterns require an equivalent enrichment to naïve paradigm-based theories. The patterns of syncretism are not a priori predicted by either class of theory, and can be accommodated with directly comparable formal devices in either class of theory. In passing, I will briefly compare Impoverishment to a similar device, namely Rules of Referral as proposed by Zwicky (1985) and developed by Stump (1993, 2001), noting that of the two, only impoverishment allows for a restrictive theory of syncretism, one which in fact captures nicely much of the data used by Stump to argue for rules of referral, and goes beyond this to provide a reason for the general directional nature of these rules.

After having shown where the two classes of theories do not differ, I will argue that one part of Williams's theory of syncretism does constitute a real point of difference between the two theories. Specifically, Williams proposes a universal requirement of an *Instantiated Basic Paradigm* (explained below). I will show that such a requirement crucially refers to implicational relations among paradigms, and thus must be stated over paradigms and can not be stated in a theory such as DM which treats paradigms as epiphenomenal constructs, arising from the combination of vocabulary items and impoverishment rules in a given language. If the Instantiated Basic Paradigm requirement is a part of Universal Grammar, then paradigms are a part of grammars, and the more restrictive vocabulary-item-based theories are inadequate. As it turns out, the Instantiated Basic Paradigm requirement is empirically untenable, a fact noted by Baerman (2000). The conclusion we must draw is that on this one point where the two classes of theories are in principle distinguishable, and on which Williams's theory includes a superset of the apparatus in the vocabulary based theory, exactly the additional expressive power which allows a paradigm-based theory to state the Instantiated Basic Paradigm requirement is in fact not made use of by UG. Thus, considerations of restrictiveness point towards the vocabulary-item-based theories, enriched with impoverishment, such as Distributed Morphology.

It should of course be noted from the outset that I neither claim (nor aim) in this paper to address all arguments that have been put forward in favour of the extra expressive power of paradigms within UG. I am simply targeting one set of what appear to be particularly good arguments for paradigms, and showing that they do not go through. I leave for future work the extension of this investigation to other arguments for paradigms, such as those put forward in work by A. Carstairs-McCarthy (for recent criticisms of which, see, e.g., Noyer 1997 and Halle & Marantz 2001), and Stump (2001).

2. UNDERSPECIFICATION AS A THEORY OF SYNCRETISM

A review of the role of underspecification in explaining certain kinds of syncretism will serve as a useful point of departure for this article. A paradigm, as presented in (2), is nothing more than a structured list of forms, a convenient descriptive device. Much of the interest in going beyond lists of forms and developing theories of paradigm structure comes from the cross-linguistic prevalence of syncretism, that is, recurrence of a single form in multiple cells of the paradigm. In English (2), the *-d* form is syncretic, occurring throughout the past tense, and the *-Ø* forms occur everywhere in the present tense *except* the 3sg. The presentation in (3) constitutes a theory of this syncretism. The set of morphosyntactic features (person, with three values, and number and tense with two values each), effectively defines the range of possible exponents (the paradigm space), and then the list of vocabulary items, consulted disjunctively from top to bottom, yields the form for any given combination of features. In this presentation, there are not five homophonous zero affixes, specified for the different contexts of insertion, rather the zero affix is treated as unspecified, having the distribution it does by virtue of the fact that there is a more highly specified vocabulary item, namely *-z*, specified to occur only in the context of third person singular. In turn, the 3sg *-z* need not be positively specified to occur only in the present tense, it does not occur in the past tense because the past tense *-d* occurs more highly in the list and will therefore take precedence in realizing the inflectional affix in the context of the features [3sg past]. Leaving aside familiar questions of order in the list (see section 2.1, below), the structure of the theory in (3) derives the information in (2), but the theory does not contain a paradigm per se. In such a theory, no grammatical principle or rule may appeal to properties of paradigm structure (as opposed to properties of features or of vocabulary items), since the paradigm structure is epiphenomenal.

Note that one property of a theory of this sort is that underspecification entails competition among vocabulary items. Given the context [3 singular past], all three vocabulary items are in principle compatible with this context, but it is the most highly ranked item in the list that is obligatorily inserted (thus: *She played*, **She plays*, **She play*). Any theory that invokes underspecification (and

thus competition of this sort) is necessarily REALIZATIONAL. Underspecification or competition for vocabulary insertion (or rule application) is always determined relative to some context, and the context must therefore be determined first. In the case of inflectional morphology, this means that the morpho-syntactic representation (called the morphemic representation in Matthews 1972) which the vocabulary items are competing to express must be determined prior to the actual choice among exponents. Realizational theories contrast with strongly lexicalist theories such as Lieber (1980, 1982) and DiSciullo & Williams (1987) in which the (syntactic) properties of a word are uniquely determined by the properties (i.e., features) of that word's constituent morphemes, *where 'morphemes' are identified by their phonological instantiations.* On strongly lexicalist theories, the verb *sing-s* is third person singular *because* the features [3,sing] are contributed by the "-s" suffix (DiSciullo & Williams 1987:27). The distinction between realizational and strongly lexicalist theories is related to the general issue of paradigm structure (strongly lexicalist theories as the term is understood here are typically incompatible with underspecification, and thus with the approach to paradigms in (3), but see Wunderlich (1995) for a hybrid approach). Nevertheless, the issue will not be taken up here, in part since the theory under investigation (Williams 1994) explicitly adopts underspecification and thus realization. In what follows, then, the entire discussion will be cast in a realizational perspective. In particular, I will cast the discussion of the paradigm-free theory in terms of the framework of Distributed Morphology (DM, Halle & Marantz 1993) . This framework is not only realizational in the broad sense but also distinct from other realizational theories such as Matthews (1972), Anderson (1992), Williams (1994) and Stump (2001) in that DM claims that the morpho-syntactic representation relative to which the rules of exponence (VOCABULARY INSERTION) apply is in fact none other than the syntactic representation – the result of the concatenative rules of syntax having applied to abstract morphemes (bundles of syntactic features). This choice – while I believe ultimately strongly justified – is for present concerns an issue of expository convenience; it has no bearing on the main point, but is useful to keep in mind in considering the specific proposals below.

2. META-PARADIGMS, OR RECURRENT PATTERNS OF SYNCRETISM

Though Williams (1981, 1984) accepts underspecification in morphology, he criticizes the kind of vocabulary-item driven approach to syncretism which (3) instantiates. His major criticism is that, in any given language, it is often true that "the pattern of syncretism is a quite abstract structure, standing above particular words, particular rules, particular suppletive relationships" (Williams 1994:26). We may illustrate Williams's point with respect to the English verbal system discussed above. The notation in (3) initially suggests that the reason the

regular past tense suffix wins out over the third person agreement (i.e., in 3sg past contexts) is precisely because the individual vocabulary item *-d* is ranked higher in the list of competitors than is *-z*. But it is not an idiosyncratic property of this exponent of past tense that it blocks 3sg agreement. Rather, it is a general property of English (ignoring *be*) that regardless of the specific past tense or past participial affix (of which there are four: *-n*, "*ed*" ={-əd, -t, -d}, *-t*, and Ø) associated with a given verb, that affix will always preclude agreement and in particular the perfectly regular third person agreement.[2] For example, the past tense of *dwell* is (for many speakers) the phonologically unexpected *dwel-t* /dwel-t/ (cf., *yelled* /yel-d/). Even though this form takes an affix distinct from the vocabulary item *-d*, the past tense in a third person singular context is the same as the past tense in all other contexts (*I dwelt*, *She dwelt*, **Last year she dwells*). As Williams puts it: "even suppletive verbs, the limiting case or irregularity, respects the pattern of syncretism; the verb *go* has *went* as its past tense form. Things could have been different: *went* could have been the third past plural form, with *goed* (or something else) for all the other forms; but then, go-went would have violated the language-wide pattern of syncretism" (p. 25). On a vocabulary-item driven approach, this means that all past tense formatives must be listed above the third person singular in the list of vocabulary items in (3).

A second example making the same point comes from Russian. The subset of formatives that occur in the nominative case for third person pronouns, along with regular nouns, short adjectives, and past tense verbs, is given in:428) as in (4).

(4) a. ACTIVE FEATURES:
3 genders
2 numbers

b. VOCABULARY ITEMS:
-/i/ ⇔ plural
-/a/ ⇔ feminine
-/o/ ⇔ neuter
-/Ø/ ⇔ elsewhere[3]

The ordering of the plural vocabulary item above the others in particular yields the familiar pattern in which gender distinctions are absent in the plural, as in the third person nominative pronouns, given in (5).

(5)

Masc (Sg.)	*on*	Masc (Pl.)	*on-i*
Fem (Sg.)	*on-a*	Fem (Pl.)	*on-i*
Neut (Sg.)	*on-o*	Neut (Pl.)	*on-i*

On the treatment in (4), the reason that there are no gender distinctions in the plural in pronouns is because of a property of the suffix *-i*, namely, its listing above the exponents of gender in (4b). Note in particular that this ordering is not (in any obvious way) forced by the elsewhere or subset principle. It is,

however, a general property of Russian that gender is never distinguished morphologically in the plural. Compare the nominative pronouns to the dative pronouns in (6) and the nominative adjectival endings in (7).

(6)

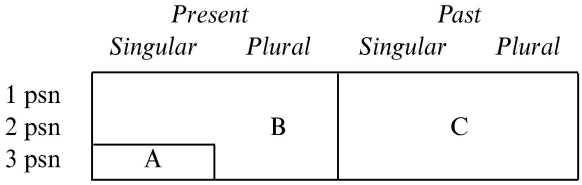
Masc (Sg.)	*emu*	Masc (Pl.)	*im*
Fem (Sg.)	*ej*	Fem (Pl.)	*im*
Neut (Sg.)	*emu*	Neut (Pl.)	*im*

(7)

Masc (Sg.)	*-yj*	Masc (Pl.)	*-ye*
Fem (Sg.)	*-aja*	Fem (Pl.)	*-ye*
Neut (Sg.)	*-oe*	Neut (Pl.)	*-ye*

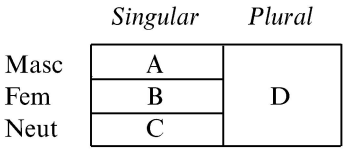
Williams's critique of vocabulary-based theories amounts to saying that it is in fact a property of English grammar that it contains, in addition to the various exponents that will fill the cells, the general paradigmatic structure in (8), what we might term a 'meta-paradigm'.

(8) The English Meta-Paradigm



Likewise, the grammar of Russian, on Williams's view would contain the information that standing above the individual exponents of gender and number features is the meta-paradigm in (9).

(9) The Russian Meta-Paradigm



Vocabulary-based theories such as (3) and (4) appear to treat these general properties of English and Russian as the accidental coincidence of a series of ordering statements. (Note, of course, that both the Russian and the English cases described here have simple solutions in terms of feature hierarchies and thus may not really bear on the issue at hand. However, they make extremely convenient surrogates for more complex cases that really illustrate Williams's point, hence I will continue to use them in this capacity.)

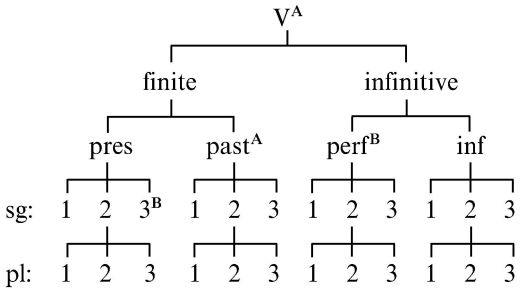
The question to ask at this point is: does the existence (descriptively speaking) of such meta-paradigmatic patterns constitute an argument for the existence of abstract paradigm structure over and above the inventory of features and the list of exponents thereof in a given language? In other words, does accepting (without argument) that the theory should account for the effects here called meta-pardigms require us also to accept paradigms?

2.1. Meta-paradigms in a paradigm-free theory

The answer is no. As we will see presently, the effects of meta-paradigms do not follow from the basic properties of either class of theory; if such effects are real, both paradigm-based and vocabulary-based theories must be supplemented to capture them. Moreover, the mechanisms required to capture the effects in either type of theory are reasonably straightforward and of comparable formal complexity. Hence, the existence of generalizations statable in terms of meta-paradigms in and of themselves do not distinguish among the two classes of theories.

To begin with, let us examine Williams's proposal for incorporating (meta-)paradigm structure into the grammar. Williams's (1981, 1984) theory of paradigms will be discussed in more detail below, but for the moment consider the following key properties of the theory.[4] The first property is that Williams imposes a hierarchical geometry on the morphosyntactic features in a given language. For the English verbal system, this hierarchy is given as in (10) (Williams 1994:24–25). The superscripts will be explained presently, the remainder of the tree is to be read such that, for example, the [+/− finite] distinction is a dependent of the feature [verb], infinitive verbs divide into two classes, "perf" corresponding to perfect (past) participles and "inf" corresponding to true infinitives, etc.[5] Thus, the node marked "3^{B}" corresponds to the feature constellation [3rd person singular past finite verb]. In this way, "the terminal nodes [of the tree structure] are the actual cells of the paradigm" (p. 24).

(10) English



The effects of meta-paradigms are captured in this view by singling out specific nodes as 'entry points' – "the points at which concrete forms are specified" (p. 24). These are indicated with superscripts. For example, regular verbs in English have four specified forms, corresponding to the nodes marked with either A or B, for example, as in (11).

(11)

V^A = *write*	$past^A$ = *wrote* [-Ø]	3^B = *writes*	$perf^B$ = *written*
V^A = *hit*	$past^A$ = *hit* [-Ø]	3^B = *hits*	$perf^B$ = *hit*
V^A = *prove*	$past^A$ = *proved* [-d]	3^B = *proves*	$perf^B$ = *proven*

Underspecification is incorporated into this theory in that "a cell is filled by the nearest specified node above it". In the case at hand, the fact noted above that the past tense form never displays the 3sg agreement suffix */-z/* is now formally expressed by the fact that no node dominated by $past^A$ has an A or B superscript. The nearest specified node above [3sg present] is that node itself (3), but the nearest node above [3sg past] is $past^A$, the general past tense. Hence, regardless of the exponent of the past tense, the meta-paradigm or 'pattern of syncretism' imposed by the tree supplemented by pre-specified entry points is invariant for the language (on the distinction between A and B, and on the verb *be*, see below).

Williams's approach to meta-paradigms thus has two key components: (i) the hierarchical organization of morpho-syntactic features, and (ii) stipulated, language-particular 'entry points' which constrain possible vocabulary items by enforcing systematic neutralizations. Each of these components has a proper analogue on the paradigm-free approach.

Note in particular that feature hierarchies already provide a simple, paradigm-free solution to the English and Russian cases discussed above. The real generalizations at stake are that a vocabulary-based theory must list all past tense formatives above agreement formatives in English, and all plural formatives above gender formatives in Russian. Just as the individual meta-paradigm structures must be stated on a language-by-language basis on a paradigm-based approach, it is by no means impossible to impose rankings on classes of features, for example, by means of a feature hierarchy ranking number above gender when the elsewhere or subset principle is not at issue (see Lumsden 1987 for such an approach) either on a language-specific basis or, more interestingly, universally (see Noyer 1997 for discussion).[6] If we may appeal to hierarchies, as Williams does, the objection to Halle's treatment disappears by simply incorporating plural > gender into the determination of disjunctive ordering statements.

For purely expository reasons, though, let us lay aside the solution in terms of hierarchies and continue to focus on the simple cases of meta-paradigms provided by English and Russian, accepting them as surrogates for more complex cases that do not admit of a simple, feature-hierarchy treatment. In particular, let us turn to the second component of Williams's theory, specifically, the

entry points. As noted above, Williams's theory is crucially realizational in the broad sense; since the lexical entries in (11) are specified relative to the marked arrangement of morpho-syntactic features in (10), the arrangement of features must be established prior to the operation of (what are effectively) lexical insertion rules in (11). The effect of the entry points is to exclude certain combinations of features from being potential targets for lexical insertion, and in particular, when this is coupled with the 'nearest specified node above it' convention, this directly mirrors underspecification. Person and number distinctions are systematically completely neutralized in the English perfect participle because no node dominated by perf^{B} is marked as a possible target for lexical insertion. That is, the nodes/cells [3sg perf], [1sg perf], [3pl perf] etc. all behave for the purposes of possible lexical insertion rules as if the person and number features were not considered, i.e., as if they were just [perf]. There can be no (usable) lexical item restricted to some subset of person or number combinations in the English perfect, as it is stipulated as a part of English grammar that there is no insertion point open to it.

Compare this to the effect of *Impoverishment Rules* introduced into the framework of DM in Bonet (1991, 1995) (see also Noyer 1988 and Frampton 2000 for discussion). DM is also a realizational framework, in which vocabulary items compete for insertion as exponents of a morpho-syntactic feature structure. Underspecification governs their insertion, as in (3). Bonet proposes that *prior to the operation of vocabulary insertion rules such as (3)*, the morphology may manipulate the morpho-syntactic representation in limited ways. One such manipulation is the deletion of features in specific contexts, a process she calls *Impoverishment*. This deletion prior to vocabulary insertion constrains possible vocabulary items by enforcing systematic neutralizations in exactly the same manner as Williams's entry points. Two examples of possible impoverishment rules are given in (12).

(12) a. [person, #] → Ø / [+perf] (or +past)
b. [gender] → Ø / [plural]

The effect of such rules is straightforward. By deleting person and number features in the context of [+perf] in English, no subsequent vocabulary insertion rule will be able to refer to these features, and thus, no verb in English can have person or number distinctions in the perfect. There can be any number of distinct exponents of [+perf] (or [+past]), but no exponent of [3sg +perf] distinct from [+perf] could exist. Moreover, even though a particular verb form may be [3sg +perf] in the syntax, the 3sg features are deleted by (12a) prior to vocabulary insertion, and thus the context for insertion of the *-z* affix is not met at the point of vocabulary insertion. By parity of reasoning, the rule in (12b) will have exactly the effect in Russian that regardless of the particular exponents involved, no gender distinctions will ever be marked in the plural. As Frampton

(2000:1) describes the argument, impoverishment rules reduce the burden on the learner; rather than learning 6 nominative forms for each aspects of Russian nounal (i.e., nominal, pronominal and adjectival) declension, the learner need only discover 4 forms for each paradigm, plus a language-wide rule deleting gender in the plural.

Impoverishment rules manipulate the morpho-syntactic structure prior to vocabulary insertion, specifically, by enforcing morphological neutralization/ underspecification effects that stand above particular words, particular rules, and particular suppletive relationships. In particular, they have the same effect as Williams's entry points, stipulating language-wide generalizations over hierarchical arrangements of features.

Note at this point that, for the cases considered above, impoverishment allows one to dispense with all ordering statements in (3) and (4) other than those enforced by the Paninian elsewhere principle (specifically, the ordering of the default last). The Russian case alluded to in footnote illustrates this. If the inputs to vocabulary insertion are fully specified, a [plural, feminine] node should provide an appropriate context for inserting either *-i* [plural] or *-a* [feminine]; as noted above, the elsewhere principle will not decide among these. Earlier in this section, it was suggested that a hierarchy might impose the necessary rule ordering, however, the impoverishment rule in (12b) provides an alternative. This impoverishment rule deletes all gender features in the context of plural as part of the mapping from a syntactic representation to vocabulary insertion. The grouping [plural, feminine] thus cannot survive to vocabulary insertion; the feature [feminine] will only survive in non-plural contexts, in plural contexts, it is the feature [plural] alone that survives. After the impoverishment rule, the issue of competition does not arise and hence, the rules of vocabulary insertion introducing *-i* and *-a* (and *-o*) need not be ordered with respect to one another.[7]

It is important to stress that the above observations do not constitute an argument that Williams's theory and that of DM (including impoverishment rules) are mere notational variants when considered *in toto*.[8] In section 3 below, I will focus on specific points on which the theories do differ, arguing for the vocabulary insertion theory. Before doing so, however, it is worth noting a few additional properties of the Impoverishment mechanism.

2.2. 'Whole-word' Syncretism

Impoverishment rules address one other criticism of vocabulary-based theories raised indirectly by Williams's comment on suppletion of *go* ~ *went*, and made more explicitly in Stump (1993) in his discussion of *Rules of Referral*. One of the cases offered in Stump (1993) to argue both in favour of rules of referral and against vocabulary-item (or 'affix')-based theories of inflection comes from

Macedonian verbal inflection. An illustrative subset of the relevant forms is given in (13).

(13) Macedonian *padn-* 'fall' (from Stump 1993: 452)

	present			past (imperf)				past (aorist)			
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

The syncretism at issue here is the conflation of 2sg and 3sg forms in the two past tenses. Important for present purposes is the fact that this conflation consists of a 'whole word' syncretism, that is, the forms are syncretic across more than one suffix position. As Stump observes (p. 453), a naïve vocabulary-based approach (assuming the segmentation indicated in (13)) would treat the absence of *-v-* in the 2sg past tense forms independently from the presence of *-še* in the 2sg imperfective past. This misses the apparent generalization that these two properties conspire to ensure identity of the 2sg and 3sg past forms.[9] To capture the facts, Stump posits the rule of referral in (14a) subsequently formalized in a manner equivalent to (14b).

(14) a. In the past tenses, the second person singular has the same form as the third person singular (p. 452)
b. Person:2 → Person:3/ [sg, past]

Stump's proposal is clearly a restatement of the description. In particular, the descriptive framework sheds no light on the question of why the syncretism is 2→3 as opposed to, say, 3→2. The impoverishment rule in (15) has the same empirical result as (14) on the assumption that third person is a default (either in terms of the rules of exponence in Macedonian or universally, on which see the discussion in Noyer 1997, section 2.1).

(15) 2 → Ø / [sg past]

The impoverishment approach answers the question of directionality; the 2sg 'cell' is filled by a 3sg form and not the other way around because deleting a '3' feature (if there is one) will not yield a second person form.[10] Note in addition that the whole-word syncretism follows on the impoverishment account even though features and vocabulary insertion may be keyed to individual positions (e.g., syntactic terminal nodes). The relevant assumption is that an individual

feature may condition vocabulary insertion at only one position (primary exponence); any instances of apparent extended exponence must therefore involve contextual allomorphy (for a theory of locality conditions on contextual allomorphy in DM, see Bobaljik 2000 and – for a response – Carstairs-McCarthy 2001). Since impoverishment precedes vocabulary insertion, impoverishment of a feature F will entail syncretism in vocabulary insertion at that position, and also in all other positions in which F serves as a context for allomorphy. Syncretisms across positions are thus not treated as accidentally parallel syncretisms, but neither is whole-word syncretism predicted across the board; independent assumptions conspire to predict that the kind of whole word syncretism evidenced by Macedonian are restricted to (but obligatory in) cases involving contextual allomorphy, a prediction which remains to be adequately tested. Impoverishment thus provides not only a resolution to two apparent objections to vocabulary-based theories (meta-paradigms, and whole-word syncretisms), it does so in a principled manner, admitting of predictions about impossible syncretisms cross-linguistically, predictions that appear to be largely borne out (see especially Noyer 1997, chapter 2).

The important point here is that, like the argument from recurrent patterns of syncretism (meta-paradigms), the argument from syncretism across positions does not in fact distinguish the two families of theories; in particular it does not lend support to Williams's theory of paradigms when contrasted with a vocabulary-item-based theory that encompasses Impoverishment rules. There is one last point on which Williams's entry points and the Impoverishment approach stand on common ground, and this is with respect to the difference between Impoverishment ad Rules of Referral.

2.3. Impoverishment versus Rules of Referral

Rules of referral (originally proposed by Zwicky 1985) are related to impoverishment rules in that both have the effect of manipulating morphosyntactic feature structures for the purposes of vocabulary insertion.[11] However, whereas Impoverishment uniquely deletes features, referral rules may convert (or relate, in Stump's 2001 framework) any arbitrary feature matrix to any other, in any context (Stump 2001 proposes some restrictions to address this criticism). Thus impoverishment rules, like Williams's entry points, embody the hypothesis that true syncretism (as opposed to accidental homophony) will always be neutralizations towards lesser marked forms (as in the Macedonian case above). Since impoverishment admits of only a (quite small) proper subset of the manipulations admitted by referral (which admits anything), impoverishment is clearly to be preferred on quite general grounds, unless it can be shown that the additional power of referral must be admitted. While this seems to be plausible for most of the cases of referral posited in the literature, Stump 2001 has argued

that there are cases which truly do motivate abandoning the more restrictive theory. Ultimately, this is beside the point for the purposes of this article; one could increase the power of the vocabulary-based theory to countenance rules of referral, and the analyses discussed here would remain unchanged. It is worth, though, taking a brief moment to examine critically the examples Stump cites to motivate referral over impoverishment.[12]

Stump argues that impoverishment is insufficient in part with reference to various syncretisms in the Romanian verbal declension. One such syncretism occurs in the imperfect paradigm of certain verbs, given here from Stump (2001, p. 215), the indicative of verb from the same inflectional classes for comparison (Stump 2001, p. 214).

(16)

	imperfect (conjugation 1) *a cânta* 'to sing'	present indicative (conjugation 1) *a súfla* 'to breathe'
1sg	*cântá-m*	*súfl-u*
2sg	*cântá-i*	*súfl-i*
3sg	*cântá*	*súfl-ă*
1pl	*cântá-m*	*suflắ-m*
2pl	*cântá-ţi*	*suflá-ţi*
3pl	*cântá-u*	*súfl-ă*

The important syncretism in this example is the neutralization of a number distinction (manifest in the indicative, see discussion below) in the first person. Stump assumes that *-m* is specified as [1pl], and thus treats this as a referral of 1sg to 1pl; that is, as referral to a more marked form, disallowed by impoverishment. Stump does not discuss an alternative which would treat *-m* as just expressing just the feature [1], hence an instance of underspecification (an 'unstipulated syncretism' in Stump's terms, p. 215). Stump treats the syncretism of 3sg and 3pl in the first conjugation present indicative in exactly these terms, i.e., as a "rule of *-ă* suffixation which expresses third person but is insensitive to number." Note that this unstipulated syncretism is restricted to the first conjugation in the present indicative, in the imperfect, the 3pl is marked by a distinct suffix *-u*.

While immediately accounting for the syncretism in the imperfect, treating *-m* as [1] raises the question of how one deals with the difference between the 1sg and 1pl in the indicative. There are various possibilities. Assuming *-u* = [1 sg indicative] and *-m* = [1] will achieve this (the Paninian or elsewhere principle enforces the ordering among the vocabulary items, [1] being a proper subset of the features in [1 sg (indicative)]). Alternatively, one might assume an impoverishment rule of the form $1 \rightarrow \emptyset$/[sg indicative]. The vocabulary item *-u* will then have to be treated as a default (at least within the indicative, effectively as suggested by Noyer 1998, see pp. 305–306).[13] Either way, the syncretism across

number in the first person imperfect is handled without appeal to referral from less to more marked.

The latter approach sheds light on another syncretism within the Romanian verbal inflection which Stump argues involves a referral between two equally marked forms, namely the syncretism of 3pl and 1sg in the present indicative forms of verbs of all conjugation classes other than the first, as in (17):

(17)

	conjugation 1		conjugation 2	
	a invita	*a súfla*	*a tăcea*	*a umplea*
	'to invite'	'to breathe'	'to be silent'	'to fill'
1sg	*invít*	*súfl-u*	*tác*	*úmpl-u*
2sg	*invíţ-i*	*súfl-i*	*tác-i*	*úmpl-i*
3sg	*invít-ă*	*súfl-ă*	*tác-e*	*úmpl-e*
1pl	*invitắ-m*	*suflắ-m*	*tăce-m*	*úmple-m*
2pl	*invitá-ţi*	*suflá-ţi*	*tăce-ţi*	*úmple-ţi*
3pl	*invít-ă*	*súfl-ă*	*tác*	*úmpl-u*

Unlike the 1sg = 1pl syncretism in (16), the 1sg = 3pl syncretism in (17) is metaparadigmatic, holding regardless of the particular exponent in question (Ø or *-u*). Stump (2001, p. 213) argues that this referral is directional, specifically 3pl takes on the form of 1sg, noting that "the syncretized forms exhibit the suffix *-u*, whose appearance in the paradigms of first-conjugation verbs is restricted to 1sg forms". This argument appears flawed, however, because in the imperfective forms of the first and fourth-conjugation verbs given in (16), the *-u* suffix appears only in the 3pl forms, and not in 1sg. Treating *-u* as inherently [1sg] is thus not obviously supported by the data cited by Stump. In fact, this rather scattered distribution of the *-u* suffix is exactly what is expected if it is to be treated as a default. Impoverishment of person and number features of both the 1sg and 3pl in the relevant tenses and verb classes will yield a retreat to the default: either *-u* or *-Ø* depending on (verb class), the result being that the forms are syncretic in those environments. Impoverishment of number only will yield the first person syncretism in the imperfect and the third person syncretism in the indicative, as noted above. In none of these three cases is any syncretism beyond retreat to the unmarked mandated by the data presented by Stump, assuming we may recognize underspecification and defaults.[14]

Theoretically, a retreat to accepting rules of referral (a superset of the feature manipulations admitted by impoverishment) is always possible, though, as has been repeatedly pointed out, admitting such rules empties this part of a theory of syncretism of any inherent predictive power – any form can in principle realize any meaning. For the purposes of the material discussed here, however, the issue is somewhat of an aside. Both Williams's entry points and the impoverishment theory share the hypothesis that syncretisms (other than

accidental homophony) involve neutralizations towards the unmarked. Up to the issue of dimensions to be discussed in section 3.3 below, Williams's theory and the theory restricting manipulations to impoverishment make the same range of empirical predictions and thus ultimately stand or fall together on this score.

3. DISTINGUISHING THE FAMILIES OF THEORIES

Let us briefly take stock of where we are. In section 2.1 I argued that the validity of generalizations which we may conveniently describe in terms of meta-paradigms does not provide an argument for paradigms. In particular, this state of affairs does not distinguish between the class of theories incorporating paradigms (as exemplified by Williams 1981, 1994) and the class based solely on vocabulary-items, exemplified by DM. Meta-paradigm effects do not come for free on either approach, and they can be accommodated on either approach by means of devices of similar complexity: stipulated entry points for Williams, impoverishment rules for DM. In particular, what is shown above is that DM, with Impoverishment rules, can account for the appearance of paradigm structure, without positing that that structure is itself a part of linguistic knowledge.

If the theories were not distinct (and moreover given the independent motivation for impoverishment mentioned in note), the parsimony argument would weigh in favour of the vocabulary-item based theories. What is necessary to defend the theory that includes a paradigm ''as a real object, and not the epiphenomenal product of various rules'' (Williams 1994: 22) is a demonstration that not only is there a (possibly emergent) structure to paradigms, but that grammar makes crucial reference to this structure. Williams suggests that this is in fact the case, in particular, he argues that there are universal implicational relationships, imposed by UG, that are crucially only statable in terms of paradigm structures, and not statable in terms of vocabulary-based theories, even as supplemented with impoverishment rules. The particular such relationship he proposes is the requirement that there be an instantiated 'basic paradigm' in every language:

(18) [W]hen there are multiple related paradigms, there will be one instantiated paradigm, and all others will have its syncretic structure, and perhaps some more. But no other related paradigm will have a contrary syncretic structure, making distinctions where that one does not. We will call that one paradigm the basic paradigm. (Williams 1994:27).

I do not dispute that this basic paradigm requirement crucially relies on paradigm structure, it places requirements on the contents of one paradigm with

crucial reference to the content of another paradigm. Thus, crucially, I accept that this requirement cannot be stated as a universal in the theory of DM or in any theory which shares the basic vocabulary-based properties. Thus, if this Instantiated Basic Paradigm requirement is truly a part of UG, then paradigm structure must be a part of linguistic competence, as Williams argues. I will argue in the subsequent subsection that the basic paradigm requirement in (18) is untenable.

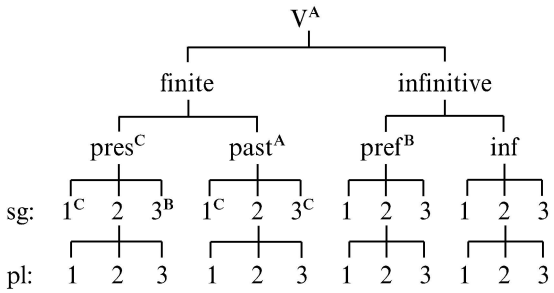
3.1. The Instantiated Basic Paradigm Requirement[15]

Williams tenders the following observations about the English verbal system. First, while the pattern of syncretism (what I am calling a meta-paradigm) appears to be quite general, the actual degree of syncretism may vary from paradigm to paradigm. Thus, the verb *be* has seven distinct forms, regular verbs four, and modals only two. This is illustrated in (19) (the letters on the right will be explained presently).

(19)	a.	be	_ is – am – are	_ was (was) – were	_ been	= CBA
	b.	write	_ writes	_ wrote	_ (written)	= B,A
	c.		can	_ could	_ *	= A

The letters on the right in (19) correspond to the entry points in the general English paradigm structure in (20), repeated from (10) with an additional set of entry points marked for *be*.

(20) English (full)



Williams next proposes that the "sets of entry points [for all verbal paradigms in English-JDB] form a nested set" (p. 25). Thus, while modals only have specified forms for points marked "A" (hence show no agreement in the present tense), main verbs have specified forms for points marked both "A" and "B", and the most differentiated verb of all, the verb *be*, has forms for all nodes marked "A", "B" and "C". Importantly, no verb in English marks a distinction

not marked by the forms of *be*.[16] This is the effect of the basic paradigm requirement in (18).

Note that this requirement crucially refers to relations among patterns of syncretism (paradigms) within a language. The schematic representation in (21) is equivalent to (18), but perhaps draws out its paradigmatic nature more clearly. This may be read as saying that, if the distinction between feature 2 and feature 3 is marked in one paradigm, and the distinction between feature 1 and feature 2 marked in another, then there will be an instantiated paradigm marking both distinctions.[17] Given the ubiquitous possibility of accidental homophony, it is important to consider patterns holding among meta-paradigms, i.e., not solely among individual vocabulary items (thus, the letters are to be thought of as variables standing in for ranges of vocabulary items).

(21) The Basic Paradigm Requirement:

				Basic Paradigm
feat 1	A	C		E
feat 2	A	D	→	F
feat	B	D		G

Limiting discussion temporarily to the nominative, accusative and genitive cases, Russian illustrates how (21) is supposed to function. Thus, examining masculine singular and all plural nouns,[18] one finds meta-paradigms fulfilling the antecedent of the conditional in (21). Some paradigms mark a distinction between nominative and accusative = genitive, others between nominative = accusative and genitive (the deciding factor in these cases is animacy). This is illustrated in (22) with the regular endings, but these are true meta-paradigms holding also of those nouns with otherwise 'irregular' declensions such as *mat'* 'mother' (NOM.PL = *materi*, ACC = GEN.PL = *materej*) and *gražd anin* 'citizen' (NOM:PL = *gražd ane*, ACC = GEN.PL *gražd an*).

(22) Russian Nominal Declension

	Masc Animate Singular	*Masc Inanimate Singular*	*Animate Plural*	*Inanimate Plural*
NOM	-Ø	-Ø	-y	-y
ACC	-a	-Ø	-Ø/-ov/ …	-y
GEN	-a	-a	-Ø/-ov/ …	-Ø/ …

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The same meta-paradigm structure emerges with adjectives, as illustrated in (23) and with pronouns (not illustrated here).[19]

(23) Russian Adjectival Declension

	Masc Animate Singular	*Masc Inanimate Singular*	*Animate Plural*	*Inanimate Plural*
NOM	-yj	-yj	-yje	-yje
ACC	-ogo	-yj	yx	-yje
GEN	-ogo	-ogo	-yx	-yx

Given the prevalence of this pattern in the Russian nominal and adjectival system, (21) implies the existence of some other paradigm with a distinct accusative form, i.e., overtly marking the three-way distinction nominative $\neq$ accusative $\neq$ genitive. Such paradigms exist, in the form of the feminine (class II) singular, for possessive pronouns, nouns and adjectives, as illustrated in (24).[20]

(24) Russian Nominal/Adjectival Declension (Fem. sg.)

	Feminine Noun	*Feminine poss. pron*	*Feminine Adjective*
NOM	-a	moj-a	-aja
ACC	-u	moj-u	-uju
GEN	-y	moj-ej	-oj

This fragment of Russian grammar neatly illustrates the functioning of (21) and thus, by (18) we would call the Feminine singular paradigm the Basic Paradigm. But the Russian feminine singular turns out very much to be a false friend for Williams, as becomes apparent when we consider the fuller range of Russian declension.

Russian distinguishes six primary morphological cases (dative, instrumental and prepositional/locative in addition to the three above) and each possible distinctions is made in at least one paradigm in the language. Nevertheless, no single paradigm – not even the personal pronouns – ever distinguishes all six cases (Jakobson 1958:113). The feminine singular in particular systematically fails to distinguish the dative from the prepositional, see (25).[21]

(25) Russian Nominal/Adjectival Declension (Fem. sg.) [expanded]

	Feminine Noun	*Feminine poss. pron*	*Feminine Adjective*
NOM	-a	moj-a	-aja
ACC	-u	moj-u	-uju
GEN	-y	moj-ej	-oj
INSTR	-oj	moj-ej	-oj
DAT	-e	moj-ej	-oj
PREP	-e	moj-ej	-oj

The feminine singular thus can not be taken as the basic paradigm because the dative and prepositional are quite regularly distinguished elsewhere, for example in plurals and in the masculine singular (26).

(26) Russian Nominal/Adjectival Declension [expanded]

	Masc Sg Noun	*Plural Nouns*	*Plural Adjective*
NOM	-Ø	-y	-yje
ACC	-Ø / -a	-y / -Ø	-yje / -yx
GEN	-a	-Ø	-yx
INSTR	-om	-ami	-ymi
DAT	-u	-am	-ym
PREP	-e	-ax	-yx (=gen)

Putting (25) and (26) together, the critical paradox for Williams arises. All (sub-)paradigms that distinguish all three of nominative, accusative and genitive systematically fail to distinguish dative from prepositional. Conversely, all (sub-)paradigms that distinguish dative from prepositional systematically fail to distinguish accusative from either nominative or genitive. There is no Instantiated Basic Paradigm in Russian.

3.2. Implications

Russian nominal declension falsifies the Instantiated Basic Paradigm requirement. To the extent that some languages may satisfy the description of having a basic paradigm, this cannot have arisen as a property of UG. Nothing in the

theory of DM prevents a language having enough vocabulary items to derive maximal differentiation in some (descriptive) paradigms, but one thing that is directly incompatible with DM is the possibility of enforcing a basic paradigm as a universal requirement. Should it have been true, DM would necessarily treat it as an accident from the point of view of synchronic morphology, and would have been forced to seek an explanation elsewhere. But there is no such universal requirement, and thus we find ourselves back at the point with which we began this section. A vocabulary-based approach – incorporating impoverishment – which takes paradigms to be the epiphenomenal result of disjunctive rules of vocabulary insertion, can adequately account for attested patterns of syncretism, even those that stand above particular words, affixes and suppletive relationships. Such a theory is therefore to be preferred on general grounds over one which posits paradigm structure in addition, unless it can be shown that grammar crucially makes reference directly to such structure. In particular, with respects to the aspects considered here, Williams's theory contains a superset of the assumptions contained in the alternative vocabulary-based theory. In section 2.1 the equivalence of designated entry points and impoverishment rules was demonstrated: both stipulate restrictions on possible vocabulary items in a given language, and both do so in exactly the same manner, that is, by enforcing neutralizations (retreat to underspecified forms) over some subset of the feature structures of a language, prior to vocabulary insertion. Inasmuch as the specific hierarchies among features invoked (see the next subsection) do not follow from deep principles of the theories, the theories actually contain the same assumptions on this point. This was highlighted in section 2.3, where the two theories together were seen to contrast with a less restrictive hypothesis about syncretism, formally encoded in rules of referral.

Both theories thus have ultimately the same means of formally encoding meta-paradigms. Both theories also assume some set of features, hierarchically organized (this generates the paradigm space), and both theories assume that particular strings of phonological information are marked to realize (via insertion) subsets of the possible combinations of features, with such insertion governed by the principles of underspecification. (Recall from above that impoverishment removed the need for extrinsic ordering statements or hierarchies within the vocabulary-item-based approach). The postulation of paradigm structure as part of grammatical knowledge, then, constitutes an additional assumption in Williams's approach over that defended here. This is about as close as one can come to an application of Occam's Razor in this area (though see the last paragraph of section 3.3, below), and the issue must therefore be decided by asking if there is any independent evidence for the postulation of this additional piece of theoretical apparatus. In discussing Williams's theory, I have shown that the Instantiated Basic Paradigm requirement would constitute one argument of exactly the right kind to establish the existence of paradigms. I have shown, however, that its core prediction is falsified.

I do not pretend in this article to have considered all the arguments for paradigms as real objects in Williams's sense, let alone arguments from competing frameworks that do not share assumptions in the manner that Williams's theory and the DM approach do (and which therefore cannot be directly compared in this manner). I leave this for future work, though I conjecture that all arguments for paradigms as real objects will fail in this manner.

3.3. Dimensions

In discussing Williams's analysis of English verbal inflection in section 3.1, I restricted myself to general aspects of the theory, comparing Williams's assumptions and predictions to those made by a vocabulary-based theory supplemented with Impoverishment. As noted above, there are a few comparatively minor points that arise, related to specifics of implementation in Williams's theory, that I will briefly mention here for the sake of completeness.

First, relative to the tree in (20), Williams must treat as accidental the fact that verbs that do not have a distinct past participle form have a past participle identical (in terms of choice of affix, though not necessarily vowel quality – see note 2) to the simple past. For example, for those verbs that do not have an *-n* suffix in the past participle, the affix used in the simple past is used in the participle as well (*play – has played*), even if that affix is otherwise 'irregular' (*feel ~ felt ~ has felt *has feeled/ *has felled*; *bind ~ bound ~ has bound *has binded/ *has bounded*). This robust generalization is predicted on the account of English inflection given in, p. 126), the relevant parts of the analysis being the vocabulary items/ realization rules given in (27).

(27) Vocabulary Items

-n	⇔	[+participle, +past]	/ (+ lexical restrictions)
Ø	⇔	[+ past]	/ (+ lexical restrictions, including $\sqrt{}$bind)
-t	⇔	[+ past]	/ (+ lexical restrictions, including $\sqrt{}$dwell)
-d	⇔	[+ past]	/ (unrestricted)
	…		

The key assumption is that the participle shares some feature with the past (here loosely termed [+past]), and that the participle is distinguished from the simple past by an additional feature (here [+participle]). All crucial orderings are determined by the elsewhere principle. From this inventory of vocabulary items, the generalization just noted follows automatically; an irregular verb (taking Ø or *-t* in the past tense) will take the same irregular suffix in the participle if it is not one of the 58 stems specified to trigger insertion of the *-n* participle. This is not a particularly interesting objection to Williams's analysis, as the trees could easily be redrawn, so that there is a node that groups past and

participle together. Indeed, Williams's comment (p. 24) that the trees are the result of "hierarchiz[ing]" a 4-dimensional paradigm suggest that a multi-dimensional strucutre (the one implied by the combination of features) will allow exactly this sort of cross-dimensional neutralization.

Second, Williams must apparently also treat as accidental the homophony of 1sg and 3sg past forms of BE *was = was*. As no node in this tree groups these forms, to the exclusion of *were* (subsumed by PAST), these are distinct entry points, hence introduced by distinct insertion rules. This syncretism is not, as far as I can see, amenable to resolution by simply re-drawing the trees, and may ultimately point to a real difference between impoverishment and entry points. If it does distinguish the theories, then it does so in favour of the impoverishment theory. A formal account of this particular syncretism within DM is presented in Halle (1997, pp. 429–431). Halle proposes that *was* instantiates the features [−Pl, +Past] for the verb *be*. Hence, the syncretism follows from underspecification. The second person singular escapes the vocabulary insertion rule inserting *was* because of a general impoverishment rule deleting [−Pl] in the context of second person. This rule enforces absolute neutralization of second person forms, either to a general second person form (as in the pronoun *you*) or to an even more general default (*are*, *were*). The treatment of *are* as the default receives independent support from negative inversion contexts in which the 1sg form *am* is (mysteriously) blocked, yielding *Aren't I…*, as discussed by. Within the context of this paper, though, I have followed Williams in using meta-paradigms – that is multiple occurrences of the same syncretism – as the working hypothesis to differentiate systematic syncretism (to be explained) from accidental homophony. As the syncretism of *was* and *was* fails this criterion, I will not pursue this line any further here, though obviously the question arises as to whether or not this is possible as a meta-syncretism.

4. CONCLUSION

In this article, I have scrutinized the theory of paradigms put forth in Williams (1981) and elaborated in Williams (1984). In particular, I have shown that despite surface appearances, this theory is quite close in its key assumptions to vocabulary-based realizational theories supplemented by Impoverishment rules (here instantiated by DM). In particular, while Impoverishment rules are an add-on to a vocabulary-based theory, they are at their core the same add-on as Williams's distinguished entry points (and may well have broader applicability, see footnote 8). Both mechanisms enforce recurrent patterns of syncretism, which I have characterized here as 'meta-paradigms', and they do so in the same manner, specifically, by enforcing neutralizations towards the unmarked, a hypothesis which distinguishes them from, for example, rules of referral.

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Nevertheless, I have isolated one point of substance on which the two frameworks under investigation here do differ, and can be made to make divergent empirical predictions. This difference involves whether or not the paradigm structure is itself postulated to be a part of individual grammars, and the predictions thus hinge on whether or not aspects of grammar must make reference to this structure. Williams presents one argument of exactly the right form to establish that the paradigm structure is 'real' in this sense. This argument arises because the postulation of paradigm structure as a primitive allows one to incorporate requirements referring to this structure to into UG; such requirements cannot in principle (so far as I can see) be stated within the more limited assumptions of a theory like DM, as they would require quite specific entailment relations to hold among the inventory of rules. Although the Instantiated Basic Paradigm Requirement does not follow in any way from Williams's theory, it can be formulated, and if substantiated, would count as a potential argument in favour of any theory which could state it over an otherwise similar theory that could not. As it turns out, Williams's hunch is incorrect; as the data from Russian shows, the Instantiated Basic Paradigm requirement cannot be a part of UG, and the additional expressive power of Williams's theory is not warranted. At least within the range of phenomena considered here, a theory with the relevant properties of DM (realization and impoverishment) is thus to be preferred.

5. APPENDIX

In closing section 3.1 above, I noted that all (sub-)paradigms that distinguish all three of nominative, accusative and genitive systematically fail to distinguish dative from prepositional and conversely, that all (sub-)paradigms that distinguish dative from prepositional systematically fail to distinguish accusative from either nominative or genitive. Thus, while there are six basic cases in Russian, the maximal number of distinct forms in any paradigm is five.[22] To be sure, there are many Russian nominal patterns which mark even fewer distinctions; feminine adjectives for example have only three distinct forms (see (25)), the numeral *sorok* 'forty' has only two (the accusative is syncretic with the nominative, of course), etc. On the theory advocated here, the fact that the maximal number of overt distinctions is one (or two) fewer than the maximal number of distributional distinctions is simply the product of the interaction of the inventory of vocabulary items with the impoverishment rules that derive the various syncretisms.[23] This is a true fact about Russian grammar, but an emergent one, not a statement with any explanatory role in the system.

It makes sense at this point to consider what the alternatives are. There are two. First, it could be that statements of the form: ''the maximally distinct paradigm must have no fewer than *n* forms'' (where *n* is defined by some

computation over the paradigm space) are points of parametric variation, e.g., language-specific. Alternatively, it could be that statements of this form *are* part of UG, but that Williams happened to have chosen the wrong computation for determining constraints on maximally distinct paradigms.

The first (language particular) approach would suffer from a number of lacunae. The most pressing is to make precise what it could mean to have a language-particular statement of this form as a part of grammatical knowledge. It is known that in addition to having implicit knowledge of grammar (i.e., generative rules, in the usual sense), speakers apparently have implicit knowledge about emergent properties of their grammar. Psycholinguistic evidence has repeatedly shown that speakers are tacitly aware (sometimes in a fine-grained, gradient manner) about the relative frequencies not only of words, but also, for example, of particular sound combinations (see, e.g., Hay 2000). Of course, where such statistical information is language-particular, it is by definition emergent. That is, the child acquiring a language cannot possibly infer statistical trends until the data over which those trends are defined (to wit, the grammar including the lexicon) has been learned. The same considerations apply in the domain of hypothetical paradigm structures. If neither UG nor any independently detectable property of Russian determines that the maximally distinct paradigm is restricted to 6/8 possible case distinctions in any number, this fact is unlearnable until the paradigms themselves and the particular syncretisms embodied in them have been learned. As an emergent property, it plays no role in the explanation of the nature of the grammatical system and is thus, from the perspective of synchronic grammar, accidental. Some account must still be given of the syncretisms observed, an account which is necessarily prior to (and thus independent of) this particular statement. Thus, while Russian speakers undoubtedly do know that no nominal class marks more than 6/8 case distinctions in any number, this is a part of (possibly tacit) knowledge *about* grammar, and not a part of their knowledge *of* grammar.

The only manner in which a statement about maximally differentiated paradigms could form part of an explanation, as opposed to the description, would be if such a restriction was either predictable on general grounds from some other property of the language (no candidate theories of this sort have been put forward to my knowledge), or if the statement was a direct consequence of UG. Williams's proposal for an Instantiated Basic Paradigm is an example of the latter. Above, I have demonstrated that this proposal is refuted by data from Russian. At this point, it makes sense to revisit the question of whether this proposal was wrong in principle (the conclusion drawn in the body of the paper) or whether it was merely wrong in its particular formulation. In reviewing Williams's proposals, Baerman (2000) appears to take the latter tack, arguing that Williams's proposal is "*almost* true" specifically that "the number of morphosyntactic slots does not exceed the number of distinct forms in the maximally defined paradigm by more than one, and this seems to represent the upper limit" (p. 1).

Without presenting a detailed review of Baerman's proposal, the highlights are the following. First, Baerman proposes a minimal amount of feature structure on the Russian cases, grouping nominative and accusative as [Direct] and all others as [Oblique]. For any declinable paradigm, the default [Direct] (=nominative) and default [Oblique] (for Russian, this is genitive) forms must be specified. Syncretism is achieved in the normal way, via underspecification (thus, if a particular case form does not have a specific ending, it will take the nearest default – genitive if oblique, nominative otherwise). Finally, Baerman countenances rules of referral which may relate any two arbitrary forms, but imposes a restriction that there be maximally one rule of referral per paradigm.[24] Hence, if Acc → Gen and Prep → Dat are necessarily achieved via rules of referral (and not underspecification) then no paradigm can show both of these syncretisms simultaneously (although note that feminine singular pronoun does show this pattern: nominative = *ona*; accusative = genitive = *(n)ejo*; prepositional = dative = *(n)ej*).[25]

Note now that Baerman's proposal does not have the effect of deriving the surface-true fact that no Russian paradigm (descriptively) marks all six (or eight) possible distinctions in any number. Baerman's proposal only sets an upper bound (of one) on rules of referral per paradigm, and hence such a pattern could exist (it would simply be a pattern without any rules of referral, of which there are many). Thus, the extent to which Baerman's proposal can be seen as reflecting a position of retreat to a weaker version of Williams's claims depends somewhat on perspective. Like the proposals I have put forward in this paper, the property of Russian that it never expresses all of the distinctions that it could express is synchronically an accident, emerging from the specific patterns of syncretism in each of the various noun classes. In particular, Baerman's proposal allows any number of distinct forms to exist in any Russian paradigm (from one = indeclinable, through two – as in the numeral *sorok* 'forty'; oblique *soroka* – up to unattested six).

More importantly for present purposes, like the impoverishment theory sketched above, and unlike the theories put forward by Williams and Carstairs-McCarthy, Baerman's proposal does not require the grammar to make inferences across paradigms, such as (21). In the terms presented here, Baerman's proposal may be cast as a restrictions on the feature-structure that defines cases, and the make-up of impoverishment rules (albeit one that raises non-trivial questions for the specific theory of DM). It does not, however, involve any statements, nor does it make any predictions, which relate the content of one paradigm to that of another. From the perspective of the questions investigated in this paper, Baerman's proposals are thus not close to those of Williams, in that they do not require the kind of explicit reference to paradigms that Williams makes. While eminently worthy of further scrutiny, Baerman's proposals do not constitute the kind of evidence for paradigms as a part of grammatical

knowledge that Williams's Instantiated Basic Paradigm proposal would have constituted, had it been right.

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NOTES

[1] Many theories lie between these extremes. Some theories for example treat paradigms as emergent constructs (thus not memorized properties of a language, in contrast to Williams) but nevertheless admit of grammatical principles which refer directly to these structures; Wunderlich (1995) outlines one such theory, Stump (2001) another. While there are perhaps few morphological theories that espouse the strong position taken by Williams, such a position does seem to be implicit in work on morphosyntax (for example Rohrbacher 1999) and morphophonology (for example, Kenstowicz 2000, McCarthy 2001) which refers directly to paradigm structure. For reviews and critiques of Rohrbacher's proposals, see Lardiere 2001 and Bobaljik (to appear).

[2] All four affixes occur with and without triggering vowel (or other stem) changes, hence the two are logically distinct, see),), though see and for qualifications.

	-Ø	-t	-ed	-en
+ Stem Change	bind, see bound-Ø, saw-Ø	buy, send bough-t, sen-t	tell, flee tol-d, fle-d	break, drive broke-n, drive-n
− Stem Change	beat, put beat-Ø, put-Ø	dwell, spell dwell-t, %spell-t	mind, ski mind-ed, ski-ed	beat, see beat-en, see-n

[3] More accurately, *yer* the so-called fleeting vowel.

[4] Let us immediately lay aside concerns about the Latin data on which Williams's theory is based, raised in Baldi (1983) and Jospeh & Wallace (1984). Our interest is the structure of Williams's theory and therefore we may grant for the purposes of discussion that the theory is adequate for some range of data.

[5] In presenting this tree, Williams states that it is a hierarchization of a 4 dimensional-strucutre (person × number × present–past × finite). The details of the correspondence to the two-dimensional representation, not made precise in Williams (1981, 1994), do not appear to be important at this point, though see section 3.3. Note that I have corrected what appears to be an alignment error in Williams's second presentation of the tree (p. 25), and replaced his superscript symbols with capital letter, purely a matter of notational convenience.

[6] The elsewhere principle is not relevant in cases where two competing vocabulary items have overlapping or disjoint (but not conflicting) features governing their insertion. In the Russian case above, [plural] and [feminine] are not ordered with respect to one another by the elsewhere principle (neither constitutes a subset of the other), hence some other means is required to determine the outcome for a [plural, feminine] form. This issue can be avoided by adding [−plural] to each of the suffixes that ultimately surface only in the singular, though it would leave as accidental the fact that gender is neutralized in all plural forms, the position Williams was objecting to. Note that the postulation of Impoverishment rules in the cases at hand, like Williams's entry points, obviates the need for any ordering statements beyond the elsewhere principle, as discussed below.

[7] See Noyer (1997) for a proposal that the hierarchy effects constrain impoverishment rules, treated as filters, rather than constraining ordering among vocabulary insertion. See Stump (2001, § 7.6) for a similar appeal to language-particular hierarchies.

[8] One important difference alluded to above is that features may be active in the syntax, despite being unexpressed (because of underspecification) in the overt morphological forms (cf., *The sheep is …* vs. *The sheep are …*, with obligatory agreement controlled by the unexpressed number of sheep referred to). It follows that such features cannot be project from the overt morphological form, a point discussed in Anderson (1992, see e.g., p. 87). Bonet discusses such cases extensively; for Williams, this means that lexical insertion can not be conceived of as rewrite rules; the syntactic features that are not expressed must be carried along with the underspecified lexical entries into the syntax. Another difference is that impoverishment rules have effects – and thus independent motivation – beyond paradigmatic syncretisms. For example, Bonet (1995) discusses the famous "spurious *se*" of Spanish, and a range of similar cases in Catalan. In the Spanish case, the combination of the third person dative (normally *le(s)*) and third person accusative (*lo*) clitics surfaces as *se lo*. In isolation, *se* has a range of uses (suggesting its default nature), but outside of this particular context, expressing third person dative is not among them. An impoverishment rule deleting all agreement features of a third person dative when preceding another third person clitic predicts that the agreement-less clitic will surface as the default, namely *se*. Unless the entire clitic cluster is treated as a paradigm, such examples constitute independent evidence for the necessity of impoverishment. See Halle & Marantz 1994 for further motivation for and discussion of this particular case.

[9] Stump (2001, p. 218) apparently retracts this argument, saying for an analogous case that for reasons of restrictiveness "[i]n the absence of any compelling counterevidence, I therefore adopt the assumption that whole-word syncretisms are simply the cumulative effect of multiple, parallel block syncretisms."

[10] This is also true of the 2sg = 3sg syncretism in Chukchi intransitives, and of the syncretism of 2pl = 3pl in Latin American dialects of Spanish. This latter instance, as described by Harris (1995), is particularly interesting from the perspective of impoverishment since deletion of the feature "2" allows gender features to find expression on the clitics, as they do with 3 person. One potential counter-example is Common Scandinavian of the pre-Viking period (e.g., 6th

century) for which Haugen (1982:129) posits an analogical transfer of the 2sg suffix -R (palatal spirant, from *-*z*) to the 3sg in the present tense. In later periods this is clearly the default, occurring throughout the present tense in the modern Mainland Scandinavian languages.

[11] Both Zwicky and Stump argue that rules of referral may be interspersed with rules of exponence, drawing on the usual arguments for feeding and bleeding relations among rules. The issue of ordering is logically independent of the issue of referral versus impoverishment. Some recent versions of DM (Marantz 2000) have accepted the proposal by Trommer (1999) that impoverishment rules are simply a special case of vocabulary insertion rules (i.e., rewriting morphosyntactic features by the empty set, rather than by a phonological string). This proposal allows for a straightforward translation of analyses of a rule of referral (now impoverishment) being overridden by a rule of exponence (here vocabulary insertion) such as Stump's (1993) analysis of exceptions to ablative-dative syncretisms in Vedic Sanskrit.

[12] There is extended discussion of this point in Noyer (1998) and the subsequent commentary (Carstairs-McCarthy 1998) and discussion. Noyer (1998) and Harbour (2001) argue that deletion alone is insufficient and that at least in some cases, when a marked value of a feature is deleted the unmarked value for that feature may be automatically inserted (see also note, below). Formal implementation aside, the question is this: do impoverishment rules change feature values from specified to unspecified (deletion, as assumed here) or do they convert marked values to unmarked (Noyer's proposal). Whichever tack is ultimately correct, the restrictiveness point vis-à-vis referral remains, though; rules of referral must be accepted only as the last resort, i.e., the admission that we can in this domain do no better than state the observed facts directly.

[13] Stump gives two arguments that third person singular is the "least marked person-number property in Rumanian" (p. 238 and n. 12), apparently implying that if there is a default form, it must be third person singular. The assumptions on which this rests are, however, not spelled out. Stump's first justification for this is syntactic: impersonal constructions bear 3sg morphology, but, it is not clear that this example is relevant; in Russian, some (syntactically) impersonal constructions are rendered with [3 sg neuter] morphology while others are rendered with obligatory [3pl] morphology. Stump does not spell out the syntactic theory from which it follows that some designated set of impersonal constructions must be taken to unambiguously identify the languages morphological default features. Stump's second justification is that "the third-person singular is morphologically unmarked in the imperfect", but for a variety of verb classes in the present indicative as illustrated in Stump's examples (p. 214) it is precisely the 1sg and 3pl forms that are morphologically unmarked. At face value, Stump's assertion thus seems arbitrary. Note in addition that the discussion fails to distinguish between a "least marked" property and an unmarked property, a distinction that DM and, I believe Stump's theory, allow. This distinction is relevant in the treatment of impersonal clitics in a variety of Romance languages, see the discussion of Spanish *se* in the references to fn. above and especially Bonet 1991, 1995.

[14] Greville Corbett has drawn my attention to another example where treating the syncretism as retreat to the unmarked case appears difficult to maintain, specifically, the paradigm of the Slovene noun *človek* 'person' as presented in Evans, Brown & Corbett 2001:215). In Slovene, the genitive and locative duals are systematically syncretic with the corresponding plurals which would initially suggest treating Dual as [+X, +Plural] with impoverishment of [+X] in these cases (+X→Ø / [Gen, Loc]) ("X" being whatever feature distinguishes among duals and true plurals, for example "limited" or just "dual", see Corbett 2000: chapter 2). Such a treatment appears to run afoul of the stem suppletion patterns of this noun, though,

which shows the suppletive stem *ljud-* in all plural forms plus precisely the two syncretised duals. Making just [+Plural] the environment for stem suppletion would falsely predict that *ljud-* should occur in all duals. Formally, what is needed for the Slovene case is precisely the kind of 'persistent redundancy rule' proposed by Noyer (1998), i.e., some mechanism to ensure that impoverishment converts marked to unmarked, rather than specified to unspecified (see note, above). There are two ways to implement this for Slovene. First, whatever "X" is, we could assume that [−X] is the unmarked value and then make the suppletion rule sensitive to the context [−X, +Pl]. It must be ensured, of course, that deletion of [+X] by an impoverishment rule will trigger insertion of the unmarked value [−X] in this context. It is also formally possible to follow Noyer in treating dual as [−sg, −pl]. To account for Nimboran, Noyer proposes the persistent redundancy rule [−sg]→[+pl] (p. 275) which "expresses the universal markedness of [−pl] in the context [−sg]" – i.e., duals. This account extends directly to Slovene, we need only assume that the impoverishment rule is [−pl]→Ø / [Gen, Loc] and the stem *ljud-* is conditioned by [+pl], as above. I leave it to the reader to verify that these analyses account for the facts – at least mechanically – and refer the reader to the discussion in) and) for opposing perspectives on persistent redundancy rules.

[15] The discussion in this subsection and the relevance of Russian for Williams's theory is prefigured by Baerman (2000), brought to my attention by G. Corbett (personal communication, 9/2001). Baerman draws a different conclusion, however, and this difference is discussed briefly in the appendix below.

[16] Various additional issues arise not as a matter of Williams's fundamental assumptions, but as a consequences of specific choices about the arrangement of features and entry points in the tree in (20). Discussion of these is postponed to section 3.3 below. Note also that the superscript "C" on the node "pres" is not actually in Williams's article, but apparently necessary ether on this node or on "finite" in order to adequately characterize the distribution of the form *are*.

[17] The instantiated requirement is important. Without it, the claim would simply amount to sufficient rationale for positing the existence of a feature. Note also that Williams is not entirely clear about whether he intends the IBP to enforce strict nestedness (as in the comment on English under example (20) – both of Williams's examples meet this requirement) or the somewhat looser requirement actually entailed by (18) and schematized in (21). The point is moot, as Russian refutes both.

[18] I make the familiar shortcut of referring to Russian noun classes by gender, though this is technically incorrect. "Masculine" in what follows corresponds to Class I (most masculine and neuter nouns) and "Feminine" to Class II. See Fraser & Corbett (1995) for a careful treatment of the relation of gender to declension class in Russian.

[19] Singular masculine and neuter pronouns follow the animate declension regardless of the animacy of their referent.

[20] In order for this subset of Russian declension to be taken as consistent with the Instantiated Basic Paradigm requirement, it is important that the plural be treated as an independent 'paradigm' on an equal footing with the masculine and feminine singular 'paradigms.' If each gender constitutes a single paradigm (with 12 cells, 6 singular and 6 plural), or if the genders are considered independently in the plural, then the syncretisms in the plural would already falsify (21). This point is of course moot in light of the discussion below.

[21] If we were to consider only the regular feminine nouns, the considerations of the previous footnote become relevant. Thus, one could treat the 'oblique' cases (instrumental, dative and

prepositional) as constituting a distinct paradigm from the 'direct' cases (nominative, accusative and genitive), in a manner analogous to the treatment of plural as constituting its own paradigm. This would defuse the argument from the syncretism in the feminine regular nouns, but is an impossible direction to pursue given the syncretism of the genitive singular with other oblique forms in the pronouns, adjectives and some nouns (e.g., *r*-stems: *mat*' 'mother', Gen.Sg = Dat.Sg *materi*, and third declension nouns).

[22] Strictly speaking, there are two other cases in Russian not considered here, namely the partitive and the locative. The partitive is a special case of the genitive (it is sometimes called the second genitive), and as most items lack a partitive case, the genitive is used in these environments. For the handful of nouns that have do a partitive case (all masculine, singular; no adjectives, pronouns or feminine nouns mark this case) it is always homophonous with the dative singular, thus: *syr* 'cheese' NOM:SG, *syru* PART:SG and DAT:SG, versus *syra* GEN:SG. All nouns with a partitive distinct from the genitive are inanimate and masculine, hence they also show syncretism of accusative and nominative. The locative is likewise a subcase of the prepositional, distinct only in certain masculine singular nouns (it is always marked by stressed *-u*, and is hence segmentally syncretic with dative and partitive, though prosodically distinct). Thus, if the partitive and locative were to be taken as seventh and eighth cases in Russian, the real generalization would have to be that the maximally distinct paradigm in Russian marks six of eight slots. Nouns illustrating this maximally distinct paradigm in the singular are *mëd* 'honey' and *sneg* 'snow'.

[23] The impoverishment of Acc → Nom is a trivial case of retreat to the unmarked. It is less clear that this is so for Acc → Gen. Note, though, that the logic of the system does not require genitive to be overall less marked than accusative. It suffices that genitive and accusative must share some feature distinguishing them from nominative (e.g., Jakobson 1958's Definite), and that accusative have some other feature distinguishing it from genitive (Jakobson's Quantificational). Impoverishment of the Definite feature will yield a ''retreat'' of accusative to the unmarked (nominative) case, while impoverishment of [−Quantificational] will yield an obligatory ''retreat'' to the default [Definite] form (accusative → genitive) (cf. Jakobson 1958:113).

[24] Baerman, like Williams, does not discuss syncretisms across numbers or across declension classes/genders. These can not be underspecification (by definition, as the paradigms are discrete), nor can they be referrals for Baerman, due to the one referral per paradigm maximum, and thus they must be treated as accidents. In this class fall: neuter = masculine in all cases except nominative (pronouns, adjectives, nouns); nominative plural = genitive singular (third declension nouns, e.g., *loshchadi* 'horses'; likewise *r*-stems *materi* 'mothers', and *v*-stems *cerkvi* 'churches; also some second declension nouns, *vílki* 'forks'; etc.), and perhaps others. Baerman's proposal also raises quite starkly questions of what constitutes a paradigm; like Williams, Baerman must treat the plural and singular of an animate feminine noun as distinct paradigms (as there is one referral in each number), and must treat each number and gender of a single adjective as separate paradigms (see notes 20–21 above).

[25] The instrumental *(n)eju* is rarely used, general oblique *(n)ej* being used instead. The *n*-initial forms are used after prepositions (hence always with the prepositional).

REFERENCES

Anderson, Stephen R. (1992). *A-Morphous Morphology.* Cambridge University Press, Cambridge.

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Techniset, Denton, Manchester 0161 335 0399

Baerman, Matthew (2000). 'Contrary syncretic structure', handout of presentation from Linguistic Association of Great Britain,.

Baldi, Philip (1983). 'On some recent claims in morphological theory'. *General Linguistics* 23.3, 171–90.

Bobaljik, Jonathan David (2000). 'The ins and outs of contextual allomorphy'. In Kleanthes K. Grohmann & Caro Struijke (eds.), *University of Maryland Working Papers in Lingustics* 10, 35–71.

Bobaljik, Jonathan David (to appear). 'Realizing Germanic inflection: Why morphology does not drive syntax'. *Journal of Comparative Germanic Linguistics.*

Bonet, Eulalia (1991). *Morphology After Syntax.* Unpublished Ph.D. Dissertation, MT, Cambridge, Mass.

Bonet, Eulàlia (1995). 'Feature structure of Romance clitics'. *Natural Language and Linguistic Theory 13*, 607–47.

Bresnan, Joan (2001). 'Explaining morphosyntactic competition'. In Mark Baltin & Chris Collins (eds.), *The Handbook of Contemporary Syntactic Theory.* Blackwell, Oxford, pp. 11–44.

Burzio, Luigi (2002). 'Missing players: Phonology and the past tense debate'. *Lingua* 112.3, 157–99.

Cameron-Faulkner, Thea & Andrew Carstairs-McCarthy (2000). 'Stem alternants as morphologica signata: Evidence from blur avoidance in Polish nouns'. *Natural Language and Linguistic Theory* 18.4, 813–35.

Carstairs-McCarthy, Andrew (1994). 'Inflection classes, gender, and the principle of contrast'. *Language* 70.4, 737–88.

Carstairs-McCarthy, Andrew (1998). 'Comments on the paper by Noyer'. In Steven G. Lapointe, Diane K. Brentari & Patrick M. Farrell (eds.), *Morphology and Its Relation to Phonology and Syntax.* CSLI, Stanford, 286–301.

Carstairs-McCarthy, Andrew (2001). 'Grammatically condtioned allomorphy, paradigmatic structure, and the ancestry constraint'. *Transactions of the Philological Society* 99.2, 223–45.

Corbett, Greville G. (2000). *Number.* Cambridge University Press, Cambridge.

DiSciullo, Anna Maria & Edwin Williams (1987). *On the Definition of Word.* MIT Press, Cambridge, Mass.

Evans, Nicholas, Dunstan Brown & Greville Corbett (2001). 'Dalabon pronominal prefixes and the typology of syncretism: a network morphology analysis'. In Geert Booij & Jaap van Marle (eds.), *Yearbook of Mophology 2000*. Kluwer, Dordrecht, pp. 187–232.

Frampton, John (2000). 'Paradigm patterns and impoverishment'. Unpublished manuscript, Northeastern University, Boston, MA.

Fraser, Norman M. & Greville G. Corbett (1995). 'Gender, animacy and declension class asignment: A unified account for Russian'. In Geert Booij & Jaap van Marle (eds.), *Yearbook of Morphology 1994*. Kluwer, Dordrecht, pp. 123–50.

Halle, Morris (1997). 'Distributed morphology: Impoverishment and fission'. In Benjamin Bruening, Yoonjung Kang & Martha McGinnis (eds.), *PF: Papers at the Interface: MIT Working Papers in Linguistics* 30, 425–49.

Halle, Morris & Alec Marantz (1993). 'Distributed morphology and the pieces of inflection'. In Ken Hale & Samuel Jay Keyser (eds.), *The View from Buildig 20: Essays in Linguistics in Honour of Sylvain Bromberger*, MIT Press, Cambridge, Mass, pp. 111–76.

Halle, Morris & Alec Marantz (1994). 'Some key features of distributed morphology'. In

Andrew Carnie, Heidi Harley & Tony Bures (eds.), *Papers on Phonology and Morphology: MIT Working Papers in Linguistics* 21, 275–88.
Halle, Morris & Alec Marantz (2001). 'Reply to Cameron-Faulkner & Carstairs-McCarthy (2000)'. Unpublished manuscript, M.I.T., Cambridge, Mass.
Harbour, Daniel (2001). 'The Kiowa case for feture insertion', Talk given at Third Mediterranean Morphology Meeting, Universitat Pompeu Fabra, Barcelona.
Harris, James (1995). 'The morphology of Spanish clitics'. In Héctor Campos & Paula Kempchinsky (eds.), *Evolution and Revolution in Linguistic Theory: Essays in Honor of Carlos Otero*, Georgetown University Press, Washington, pp. 168–97.
Haugen, Einar (1982). *Scandinavian Language Structures.* University of Minnesota Press, Minneapolis.
Hay, Jen (2000). *Causes and Consequences of Word Structure.* Unpublised Ph.D dissertation, Northwestern University,
Jakobson, Roman (1958) [1984]. 'Morphological observations on Slavic declension (the structure of Russian case forms)'. In Linda R. Waugh & Morris Halle (eds.), *Roman Jakobson: Russian and Slavic Grammar*, *Studies 1931–1981*. Walter de Gruyter, Berlin, pp. 105–33.
Joseph, Brian & Rex Wallace (1984). 'Latin morphology: another look'. *Linguistic Inquiry* 15.2, 319–28.
Kenstowicz, Michael (2000). 'Paradigmatic uniformity and contrast'. Unpublished manuscript, MI, Cambridge, MA.
Lardiere, Donna (2000). 'Mapping features to forms in second language acquisition'. In John Archibald (ed.). *Second Language Acquisition and Linguistic Theory*, Blackwell, Oxford, pp. 102–29.
Lieber, Rochelle (1980). On the organization of the lexicon. Unpublished M.I.T., Cambridge MA.
Lieber, Rochelle (1982). 'Allomorphy'. *Linguistic Analysis* 10.1, 27–52.
Lumsden, John (1987). *Syntatic Features: Parametric variation in the History of English.* Unpublished Ph.D. Dissertation (Distributed by *MITWPL)*, M.I.T., Cambridge, MA.
Marantz, Alec (2000). 'The distributed morphology of inflection: Locality and underspecification', Talk presented at Trondheim (October 2000).
Matthews, P.H (1972). 'Inflectional morphology: A theoretical study based on aspecs of Latin verb conjugation'. Cambridge University Press, Cambridge.
McCarthy, John (2001). 'Optimal paradigms'. Unpublished manuscript, University of Massachusetts, Amherst.
Noyer, Rolf (1997). *Features*, *Positions and Affixes in Autonomous Morphological Struture.* Garland Press, New York.
Noyer, Rolf (1998). 'Impoverishment theory and morphosyntactic markedness'. In Steven G. Lapointe, Diane K. Brentari & Patrick M. Farrell (eds.), *Morphology and its Relation to Phonology and Syntax*. CSLI, Stanford, pp. 264–85.
Plank, Frans (1991). 'Rasmus Rask's dilemna'. In Frans Plank (ed.), *Paradigms: The Economy of Inflection*. Mouton de Gruyter, Berlin, pp. 161–96.
Rohrbacher, Bernhard (1999). *Morphology-Driven Syntax: A Theory of V to I Raising and Pro-drop*. John Benjamin, Amsterdam.
Stump, Gregory T. (1993). 'On rules of referral'. *Language* 69.3, 449–79.
Stump, Gregory T (2001). *Inflectional Morphology: A Theory of Paradigm Structure.* Cambridge University Press, Cambridge.
Trommer, Jochen (1999). 'Morphology consuming syntax's resources: Generation and parsing

in a minimalist version of distributed morphology'. Unpublished manuscript, Universität Potsdam, Potsdam.
Williams, Edwin (1981). 'On the notions "Lexically related" and "Head of a word"'. *Linguistic Inquiry* 12.2, 245–74.
Williams, Edwin (1994). 'Remarks on lexical knowledge'. *Lingua* 92, 7–34.
Wunderlich, Dieter (1995). 'Minimalist morphology: The role of paradigms'. In Geert Booij & Jaap van Marle (eds.), *Yearbook of Morphology 1995*. Kluwer, Dordrecht, pp. 93–114.
Zwicky, Arnold M. (1985). 'How to describe inflection'. In *Proceedings of the Berkeley Linguistics Society*, pp. 372–86.

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