

# A Distributed Morphology Approach to Syncretism in Russian Noun Inflection\*

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## 1. Introduction

Russian noun inflection exhibits many instances of syncretism (understood here in a broad sense, as homonymy of inflection markers). There are two basic types. First, there is *intra-paradigmatic* syncretism, i.e., homonymy of inflection markers for two (or more) cases within an inflection class. Second, there is *trans-paradigmatic* syncretism, i.e., homonymy of inflection markers across inflection classes (the homonymous markers may or may not be for identical cases).<sup>1</sup> Following seminal work by Jakobson (1962a,b), intra-paradigmatic syncretism has been approached by decomposing standard, privative case features like [nom], [acc], etc. into combinations of more abstract, binary features, such that natural classes of cases are formed that inflection markers can refer to. In contrast, trans-paradigmatic syncretism has not yet been addressed in a principled way. The main goal of this paper is to show that trans-paradigmatic syncretism can be derived systematically in essentially the same way as intra-paradigmatic syncretism if inflection class features like [class I], [class II], etc. are also decomposed into combinations of more abstract, binary features, such that natural classes of inflection classes are formed that inflection markers can refer to. This implies that inflection markers may bear underspecified case and inflection class information, which often leads to a competition of markers. The competition can be resolved by selection of the most specific

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\*For helpful comments and discussion, I would like to thank Artemis Alexiadou, John Bailyn, Loren Billings, Jonathan Bobaljik, Wayles Browne, Steven Franks, Jadranka Gvozdanović, Lutz Gunkel, Milan Rezac, Anita Steube, Anna Volodina, Bernd Wiese, Dieter Wunderlich, Gisela Zifonun, Ilse Zimmermann, an anonymous FASL reviewer, and the audiences of FASL 12 (University of Ottawa, May 9, 2003) and FDSL 5 (Universität Leipzig, November 26, 2003).

<sup>1</sup>Throughout this paper, I assume that paradigms have no status except as empirical generalizations; see, e.g., Bobaljik (2002), Harley & Noyer (2003).

marker.

Since the analysis is based on underspecification and specificity-based competition, it presupposes an approach to inflectional morphology that recognizes these two concepts. One such approach is Distributed Morphology (see Halle & Marantz (1993), Harley & Noyer (2003)), which will be adopted here.<sup>2</sup>

A caveat is due before I turn to the empirical evidence: Throughout, I focus on the core system of noun inflection in Russian. This implies that I disregard minor inflection classes, minor cases, stem alternations, stress patterns, lexical idiosyncrasies, and so on. These issues are ultimately important; but my hope is that they do not significantly affect what I have to say here about intra- and trans-paradigmatic syncretism.

## 2. Data

Russian has six cases: nominative (nom), accusative (acc), dative (dat), genitive (gen), instrumental (inst), and locative (loc). Furthermore, I assume that there are four inflection classes, labelled I-IV.<sup>3</sup> For now, I focus on the singular (see section 6 on the plural).

Consider first inflection class I, which contains only masculine stems. Three sample paradigms are given in table T<sub>1</sub>. The variation in this class is conditioned by two factors: First, inanimate noun stems like *zavod* ('factory') employ the nominative marker /Ø/ (= null) in the accusative, whereas animate noun stems like *student* ('student') take the genitive marker /a/ in the accusative.<sup>4</sup> Second,

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<sup>2</sup>However, most of what follows can also be formulated in alternative approaches that allow underspecification and specificity-based competition, like, e.g., the ones developed by Carstairs (1987), Anderson (1992), Blevins (1995), Wunderlich (1996), or Stump (2001). In fact, there is a more comprehensive version of the present material (see Müller (2003a)) which does not assume Distributed Morphology. The only case where Distributed Morphology may initially seem crucial involves the analysis of the animacy effect in section 7, which relies on impoverishment; but see the remarks there.

<sup>3</sup>This follows Corbett & Fraser (1993); reference grammars typically postulate three main classes (see, e.g., Isačenko (1975)). As we will see, there is no real contradiction here if inflection class features are decomposed.

<sup>4</sup>Here and henceforth, the / / notation is used so as to indicate that the markers

there are systematic, morpho-phonologically predictable differences between nouns whose stem ends in a “hard” (i.e., [+back]) consonant and nouns whose stem ends in a “soft” (i.e., [-back]) consonant: compare *student* (‘student’) with *žitel’* (‘inhabitant’).

$T_1$ : Inflection class I, Sg.: masc

	I		
	<i>zavod<sub>m</sub></i> (‘factory’)	<i>student<sub>m</sub></i> (‘student’)	<i>žitel<sub>m</sub></i> (‘inhabitant’)
nom/sg	zavod-Ø	student-Ø	žitel’-Ø
acc/sg	zavod-Ø	student-a	žitel-ja
dat/sg	zavod-u	student-u	žitel-ju
gen/sg	zavod-a	student-a	žitel-ja
inst/sg	zavod-om	student-om	žitel-em
loc/sg	zavod-e	student-e	žitel-e

Inflection class II has mainly feminine stems; it is illustrated in table  $T_2$ . This time, there is no animacy effect in the accusative, which employs a uniform marker /u/ for, e.g., inanimate *komnat* (‘room’) and animate *učitel’nic* (‘female teacher’). However, as before, there is predictable morpho-phonological variation that depends on the nature of the stem ending as [ $\pm$ back]; compare, e.g., the markers attached to a stem ending in a hard consonant (like *komnat* (‘room’)) with the endings attached to a stem ending in a soft consonant (like *nedel’* (‘week’)). Furthermore, this inflection class is not gender-specific: In addition to the feminine stems, some masculine stems also belong to this class (like *mužčin* (‘man’)); these stems trigger masculine agreement but inflect according to the pattern in  $T_2$ . Unlike the masculine stems in class I, masculine stems in class II exhibit no animacy effect in the accusative.

Next, inflection class III is illustrated in table  $T_3$ . Abstracting away from a few exceptions, this class contains only feminine stems. All stems in this class end in a soft consonant. Class III shows fewer case differentiations (consequently, more intra-paradigmatic syncretism) than classes I and II; in the singular, it employs only the three markers /Ø/, /i/, and /ju/ for the six cases. Some nouns exhibit

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have the status of underlying representations that may undergo changes on the way to PF realization.

$T_2$ : Inflection class II, Sg.: fem, masc

	II			
	<i>komnat<sub>f</sub></i> (‘room’)	<i>učitel’nic<sub>f</sub></i> (‘teacher’)	<i>nedel’<sub>f</sub></i> (‘week’)	<i>mužčin<sub>m</sub></i> (‘man’)
nom/sg	komnat-a	učitel’nic-a	nedel-ja	mužčin-a
acc/sg	komnat-u	učitel’nic-u	nedel-ju	mužčin-u
dat/sg	komnat-e	učitel’nic-e	nedel-e	mužčin-e
gen/sg	komnat-y	učitel’nic-y	nedel-i	mužčin-y
inst/sg	komnat-oj(u)	učitel’nic-ej(u)	nedel-ej(u)	mužčin-oj(u)
loc/sg	komnat-e	učitel’nic-e	nedel-e	mužčin-e

stem alternation (compare *doč’* (‘daughter’)).

$T_3$ : Inflection class III, Sg.: fem

	III		
	<i>tetrad’<sub>f</sub></i> (‘notebook’)	<i>myš’<sub>f</sub></i> (‘mouse’)	<i>doč’<sub>f</sub></i> (‘daughter’)
nom/sg	tetrad’-Ø	myš’-Ø	doč’-Ø
acc/sg	tetrad’-Ø	myš’-Ø	doč’-Ø
dat/sg	tetrad-i	myš-i	doč-er-i
gen/sg	tetrad-i	myš-i	doč-er-i
inst/sg	tetrad’-ju	myš’-ju	doč-er’-ju
loc/sg	tetrad-i	myš-i	doč-er-i

Finally, inflection class IV contains only neuter stems; see table  $T_4$ . This class is similar to class I but differs in the choice of markers for nominative and accusative in the singular (class IV also differs from class I in the plural; see below). There is no animacy effect in the singular (even though there are some animate stems belonging to this class, like *suščestv* (‘creature’)); but, as before, there is [ $\pm$ back]-governed morpho-phonological variation (compare *pol’* (‘field’)).

The task of the inflectional morphology component of a grammar is to provide the correct inflection marker for any given noun stem. Ideally, one might hope that information that is inherently present on a stem – like gender, phonological, or semantic features – will suffice. This is not the case, though. Consider first gender features. Neuter noun stems always belong to class IV. However, masculine stems may in principle belong to class I or class II; and feminine stems may belong to class II or class III. Similarly, phonological features of the stem do not suffice to predict inflection class; e.g.,

*T<sub>4</sub>: Inflection class IV, Sg.: neut*

	IV			
	<i>mest<sub>n</sub></i> ('place')	<i>jablok<sub>n</sub></i> ('apple')	<i>suščestv<sub>n</sub></i> ('creature')	<i>pol'<sub>n</sub></i> ('field')
nom/sg	mest-o	jablok-o	suščestv-o	pol-e
acc/sg	mest-o	jablok-o	suščestv-o	pol-e
dat/sg	mest-u	jablok-u	suščestv-u	pol-ju
gen/sg	mest-a	jablok-a	suščestv-a	pol-ja
inst/sg	mest-om	jablok-om	suščestv-om	pol-em
loc/sg	mest-e	jablok-e	suščestv-e	pol-e

a feminine stem ending in a soft ([–back]) consonant can belong to class II or class III. In addition, there are no theme vowels in modern Russian that might signal class membership (see Wurzel (1984) and Corbett & Fraser (1993)), despite claims to the contrary (see, e.g., Wunderlich (1996), Wunderlich (2002).) Finally, semantic features of the noun stem are insufficient as predictors of class membership; e.g., whereas animacy does play a role in inflection (see section 7), all classes may in principle contain both animate and inanimate noun stems (recall that this also holds for the neuter class IV). Note finally that not even a combination of gender, phonological, and semantic information suffices to fully predict class membership. For instance, a feminine, inanimate noun stem ending in a soft consonant may belong to class II or class III; a masculine, animate noun stem ending in a hard consonant may belong to class I or class II; etc. Thus, arbitrary inflection class features must be assumed as inherent properties of noun stems. In the following sections, I will argue that there is indeed reason to strengthen their role in morphological theory, by holding them responsible for the occurrence of trans-paradigmatic syncretism.

### 3. Syncretism

Table T<sub>5</sub> lists the instances of syncretism in the singular as they can be extracted from T<sub>1</sub>–T<sub>4</sub>.<sup>5</sup>

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<sup>5</sup>In this table, inflection marker variation that is systematically predictable in terms of the [±back] distinction is not indicated separately. Thus, I assume that there is a morphophonological rule that realizes the underlying inflection marker

*T<sub>5</sub>: Syncretism within and across inflection classes in Russian*

	I <sub>m</sub>	II <sub>f,m</sub>	III <sub>f</sub>	IV <sub>n</sub>
nom	∅	a	∅	o
acc	∅/a	u	∅	o
dat	u	e	i	u
gen	a	i	i	a
inst	om	oj	ju	om
loc	e	e	i	e

There is both intra- and trans-paradigmatic syncretism in T<sub>5</sub>. Instances of intra-paradigmatic syncretism involve, e.g., /e/ in the dative and locative in class II; /i/ in the dative, genitive, and locative in class III; /o/ in the nominative and accusative in class IV; and so on. Instances of trans-paradigmatic syncretism involve /∅/ in the nominative (and in the accusative, which makes this syncretism intra-paradigmatic in addition) in classes I and III; /i/ in the genitive in class II and III (and, as just noted, also in the dative and in the locative in class III); /om/ in the instrumental in classes I and IV; /u/ in the dative in classes I and IV, and in the accusative in class II; and /a/ in the genitive in class I and IV, and in the nominative in class II.<sup>6</sup>

The question then is to what extent these instances of syncretism can or should be taken to be systematic. I adopt (1) as a meta-grammatical principle.

(1) *Syncretism Principle*:

Identity of form implies identity of function

(in a domain Σ, and unless there is evidence to the contrary).

The Syncretism Principle may look quite radical, but I take it to be the null hypothesis, both for a child acquiring a language, and for a linguist investigating it. According to (1), all instances of syncretism should initially be considered systematic within a certain grammat-

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/om/ as *em* after a soft ([–back]) consonant, and as *om* otherwise. Similarly, underlying /oj/ is realized as *ej* after a [–back] consonant, and as *oj* otherwise. Finally, underlying /i/ is realized as *y* after a hard ([+back]) consonant, and as *i* otherwise.

<sup>6</sup>For now, I ignore the animacy-driven occurrence of /a/ in the accusative of class I. I will return to this phenomenon in section 7.

ical domain, and can be considered accidental only in the face of strong counter-evidence.<sup>7</sup> Of course, the question is what the domain  $\Sigma$  in (1) should be for our present concerns. I assume that  $\Sigma$  includes different cases and inflection classes, but not different numbers; i.e., I will not try to account for instances of syncretism that hold between singular and plural.<sup>8</sup>

The many instances of syncretism in Russian noun inflection illustrated in  $T_5$  have of course not gone unnoticed. Basically, three different kinds of approaches to syncretism in Russian noun inflection can be distinguished. First, Jakobson (1962a,b), Chvany (1986), Neidle (1988), Franks (1995), and Wiese (2003) propose accounts that rely on a decomposition of case features, which creates natural classes of cases that insertion contexts for inflection markers can refer to. In accounts of this type, an intra-paradigmatic syncretism where some marker  $/\mu/$  is used in two cases  $C_1, C_2$  is due to the fact that  $C_1, C_2$  form a natural class characterized by an abstract feature (or set of features)  $\mathbb{F}$ , and the insertion context of  $/\mu/$  refers to  $\mathbb{F}$ , i.e., to what  $C_1, C_2$  have in common, rather than to  $C_1$  or  $C_2$  directly. Second, Halle (1994) develops an analysis (in an early version of Distributed Morphology) that is based on disjunctions in vocabulary insertion rules. For the abstract example just mentioned, such an ap-

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<sup>7</sup>This implies a shift of perspective from standard assumptions, and a change of burden of proof: It must be shown that a given instance of syncretism is non-systematic, not that it is systematic. In line with this, I would like to contend that there is indeed less evidence against the systematicity of syncretism than is sometimes made out (see, e.g., Carstairs (1987), Zwicky (1991), Williams (1994)).

<sup>8</sup>Also see Baerman et al. (2002). This difference between number on the one hand and case and class on the other may ultimately be traced back to whether or not a feature carries semantic information – number features do, whereas class features and case features (at least those of the languages under consideration in this paper, which do not exhibit ‘semantic cases’) do not. – The denial of systematicity of “trans-number” syncretism implies that the well-known alternation effect between nominative singular and genitive plural (see below on the latter) with respect to the occurrence of  $/\emptyset/$  (an inflection class has  $/\emptyset/$  in the genitive plural iff it does not have  $/\emptyset/$  in the nominative singular) must be considered accidental from a synchronic perspective. (Incidentally, all systematic accounts of this phenomenon that I am aware of require a significantly more complex approach, e.g., by permitting reference to existing output forms in the determination of markers; see Bailyn & Nevins (2003) for a recent analysis.)

proach amounts to postulating that there is a rule that inserts / $\mu$ / in  $\mathbb{C}_1$  or in  $\mathbb{C}_2$  environments. Third, Corbett & Fraser (1993), Fraser & Corbett (1994), and Stump (2001) employ rules of referral that simply stipulate identity of markers with different functions. For the case at hand, this would imply taking one occurrence of / $\mu$ / as basic (by, e.g., postulating that / $\mu$ / occurs in  $\mathbb{C}_1$  environments), and deriving the other occurrence as secondary (by then postulating that the marker for  $\mathbb{C}_2$  is identical to the marker for  $\mathbb{C}_1$ ).

None of these approaches is fully satisfactory. The second and third types of analyses (that rely on disjunction and referral, respectively) suffer from employing non-restrictive techniques (in effect, *any* kind of syncretism could be captured), and from being highly descriptive (the instances of syncretism are stated rather than derived). In contrast, while I take the first type of approach (based on case feature decomposition) to be essentially on the right track as far as intra-paradigmatic syncretism is concerned, it has nothing to say about instances of trans-paradigmatic syncretism. Hence, my objective in the following sections will be to extend a feature decomposition approach to inflection classes, so as to capture both intra- and trans-paradigmatic syncretism in Russian noun inflection.

#### 4. Assumptions

Let me begin by laying out some background assumptions about fusional noun inflection systems that I will make within a Distributed Morphology setting (see Halle & Marantz (1993), Harley & Noyer (2003)). A noun stem ( $N$ ) is a terminal node in syntax; following Chomsky (2001, 11) (and deviating from some work in Distributed Morphology), I assume that a noun stem has phonological content in syntax already. Furthermore, it is inherently equipped with fully specified inflection class features (alongside gender, semantic, selectional, and categorial features), but not with case or number features. In languages with fusional noun inflection, a noun stem is accompanied by a fusional case/number morpheme ( $cn$ ). A case/number morpheme  $cn$  is a terminal node in syntax that is phonologically empty, and that is inherently equipped with fully specified case and number (as well as [+N] category) features.  $N$  and  $cn$  may either form



a complex  $X^0$ , or may each project an XP. For concreteness, I adopt the latter view, and assume that there is obligatory head movement from  $N$  to  $cn$ , as in (2). (I also assume that inherent class and gender features of  $N$  are copied onto  $cn$  as a result of this movement, but this is mainly to simplify the discussion below.)

(2) [<sub>cnP</sub> N-cn [<sub>NP</sub> ... t<sub>N</sub> ... ]]

The case/number morpheme  $cn$  is spelled out post-syntactically by insertion of an appropriate inflection marker, i.e., a vocabulary item that pairs phonological information and (possibly underspecified or absent) morpho-syntactic (category, class, case, and number) features that encode its insertion context. For vocabulary insertion to succeed, the morpho-syntactic features of an inflection marker must be a subset of the morpho-syntactic features provided by the syntactic context, i.e.,  $cn$ ; this is the first requirement imposed by the Subset Principle, a version of which is given in (3).<sup>9</sup>

(3) *Subset Principle:*

A vocabulary item  $V$  is inserted into a functional morpheme  $M$  iff (i) and (ii) hold:

- (i) The morpho-syntactic features of  $V$  are a subset of the morpho-syntactic features of  $M$ .
- (ii)  $V$  is the most specific vocabulary item that satisfies (i).

Because of underspecification, the insertion contexts of inflection markers will turn out to overlap significantly. Hence, inflection markers may compete for insertion into a given  $cn$ , and such competition is resolved by the second requirement of the Subset Principle in (3): Of those inflection markers that fit into a given  $cn$  position, only the most specific marker can actually be inserted. Specificity can be defined as in (4).

(4) *Specificity of vocabulary items:*

A vocabulary item  $V_i$  is more specific than a vocabulary item  $V_j$  iff there is a class of features  $\mathbb{F}$  such that (i) and (ii) hold.

- (i)  $V_i$  bears more features belonging to  $\mathbb{F}$  than  $V_j$  does.

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<sup>9</sup>See Kiparsky (1973), Lumsden (1992), Noyer (1992), Williams (1994), and Blevins (1995), among others, for other versions, sometimes with different names; and in particular Halle (1997), which the present formulation is based on.

(ii) There is no higher-ranked class of features  $\mathbb{F}^V$  such that  $V_i$  and  $V_j$  have a different number of features in  $\mathbb{F}^V$ .

(4) presupposes a ranking of feature classes (see Lumsden (1992), Noyer (1992)). For present purposes, the partial hierarchy in (5) will suffice; it identifies three feature classes: number, class, and case.

(5) Number  $\gg$  class  $\gg$  case

On the basis of these assumptions, I now turn to a decomposition of case and inflection class features that forms the core of the analysis.

## 5. Analysis

As noted, intra-paradigmatic syncretism can be accounted for by decomposing privative case features into combinations of more primitive, binary case features; this yields natural classes of cases. These primitive features are semantics-based in the tradition initiated by Jakobson (1962a,b) (see, e.g., Neidle (1988) and Franks (1995)). In contrast, I assume that the primitive case features are syntax-based, as suggested by Bierwisch (1967) for German, and elaborated by Wiese (2001) for Latin. Thus, suppose that the six Russian cases result from the cross-classification of the three binary primitive case features  $[\pm\text{subject}]$ ,  $[\pm\text{governed}]$ ,  $[\pm\text{oblique}]$ , as shown in (6).<sup>10</sup>

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<sup>10</sup>Two potential cases thus remain unused. Note that the specifications in (6) are syntactically motivated: First, the  $[\text{+subj}]$  cases nominative, genitive, and instrumental all typically show up on arguments that are merged last with a predicate (NP-internally with the genitive, in passive constructions with the instrumental). Second, the  $[\text{+gov}]$  cases accusative, dative, and genitive are the prototypical cases for objects of V. Finally, the  $[\text{+obl}]$  cases dative, genitive, instrumental, and locative differ from the non-oblique cases nominative and accusative in that the latter (but not the former) typically encode the core arguments of V. Needless to say, the morphological case specifications based on these features only reflect *primary* syntactic functions, and may be at variance with other syntactic functions. Underlying this is the assumption that it is unlikely that a simple, homogeneous specification (be it syntactic or semantic) can be found for all cases, in all their occurrences (see Isačenko (1975, 81)); but see, e.g., Bailyn (2003) for a recent attempt concerning the Russian genitive.

(6) *Decomposition of cases in Russian:*

nominative:	[+subj,−gov,−obl]
accusative:	[−subj,+gov,−obl]
dative:	[−subj,+gov,+obl]
genitive:	[+subj,+gov,+obl]
instrumental:	[+subj,−gov,+obl]
locative:	[−subj,−gov,+obl]

Underspecification with respect to case features will then encode natural classes of cases. For instance, nominative and accusative form a natural class characterized by the feature [−obl]; accusative and dative form a natural class characterized by the features [−subj,+gov]; and so on. As we will see, feature specifications of vocabulary items may make use of this kind of reduced case information, which accounts for intra-paradigmatic syncretism.

Crucially, I would like to suggest that trans-paradigmatic syncretism can be derived in the same way, by decomposing privative class features as they are standardly assumed (like [class I], [class II]), into more primitive, binary class features. Cross-classification of these abstract features yields inflection classes; underspecification of inflection markers encodes natural classes of inflection classes and thereby explains trans-paradigmatic syncretism.<sup>11</sup> The four inflec-

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<sup>11</sup>There are predecessors. First, Halle (1992, 38) employs the primitive, decomposed features [±marginal], [±marked] (in addition to the “standard” class features A, B) in his analysis of Latvian noun inflection, essentially so as to account for instances of trans-paradigmatic syncretism. Second, Nessel (1994, 229ff) develops an analysis of Russian noun inflection that uses [±nom-end] and [a/igen-end] as primitive class features, again in order to account for instances of trans-paradigmatic syncretism. The analysis has a limited scope (involving only a few of the attested cases of trans-paradigmatic syncretism, and no cases of intra-paradigmatic syncretism), and stays somewhat informal (e.g., theoretical issues arising with underspecification and competition of inflection markers are not explored – more generally, no attempt is made to account for the whole system of noun inflection in a systematic way); nevertheless, it is clearly guided by the same underlying idea. Third, Oltra Massuet (1999) develops an analogous proposal for verbal inflection in Catalan. Note also that class feature decomposition is suggested in Alexiadou & Müller (2003) for noun inflection in Greek and German, and in Müller (2003b) for noun inflection in Icelandic. For attempts to establish natural classes of noun inflection classes in Russian without invoking feature decomposition, see McCreight & Chvany (1991), Wiese (2003).

tion classes result from a cross-classification of two abstract features  $[\pm\alpha]$ ,  $[\pm\beta]$  as shown in (7).<sup>12</sup>

(7) *Decomposition of inflection classes in Russian:*

I:	$[+\alpha, -\beta]$	<i>zavod<sub>m</sub></i> ('factory')
II:	$[-\alpha, +\beta]$	<i>komnat<sub>f</sub></i> ('room'), <i>mužčin<sub>m</sub></i> ('man')
III:	$[-\alpha, -\beta]$	<i>tetrad'<sub>f</sub></i> ('notebook')
IV:	$[+\alpha, +\beta]$	<i>mest<sub>n</sub></i> ('place')

According to (7), inflection classes I and IV form a natural class (characterized by  $[\alpha]$ ), and so do classes II and III ( $[-\alpha]$ ), classes I and III ( $[-\beta]$ ), and classes II and IV ( $[\beta]$ ). However, classes I and II do not form a natural class of inflection classes, and the same goes for classes III and IV. Consequently, no insertion context of an inflection marker can refer to either of these groups of inflection classes, and we expect that there is no instance of trans-paradigmatic syncretism that applies exclusively to classes I and II, or to classes III and IV. This prediction will be shown to be borne out.

The list of vocabulary items that I assume to underlie noun inflection in the singular in Russian is given in (8); underspecified class information is underlined in the feature specifications of markers. In general, specificity decreases from top to bottom. The default (or elsewhere) inflection marker is /a/ in (8-10) (or /a/<sub>10</sub>, as I will write from now on); it fits into all *cn* morphemes but is blocked by a more specific marker in most contexts. Next, /u/<sub>9</sub> emerges as a highly non-specific marker for accusative and dative that does not bear any inflection class information. /i/<sub>8</sub> is a general obliqueness marker for the  $[-\alpha]$  classes II and III; /Ø/<sub>7</sub> is a non-obliqueness marker for the  $[-\beta]$  classes I and III; and /o/<sub>6</sub> is a non-obliqueness marker for class IV. Two vocabulary items /e/ are postulated: /e/<sub>5</sub> is a locative marker for the  $[\alpha]$  classes I and IV; /e/<sub>4</sub> is a marker for the natural class of dative and locative in class II. Finally, the markers /om/<sub>3</sub>, /ju/<sub>2</sub>, and /oj/<sub>1</sub> are instrumental markers. The latter two are fully specified (hence, most specific); /om/<sub>3</sub> is restricted to the  $[\alpha]$  classes I, IV.

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<sup>12</sup>Inflection class features are arbitrary and irreducible by definition; this is reflected in the labels. Still, it is worth emphasizing that the features  $[\pm\alpha]$ ,  $[\pm\beta]$  are no more arbitrary than standardly adopted features like [class I], [class II].

(8) *Vocabulary items* (singular):

1. /oj/  $\longleftrightarrow$   $\{[+N],[-\alpha,+\beta],[+subj,-gov,+obl]\}$
2. /ju/  $\longleftrightarrow$   $\{[+N],[-\alpha,-\beta],[+subj,-gov,+obl]\}$
3. /om/  $\longleftrightarrow$   $\{[+N],[+\alpha],[+subj,-gov,+obl]\}$
4. /e/  $\longleftrightarrow$   $\{[+N],[-\alpha,+\beta],[-subj,+obl]\}$
5. /e/  $\longleftrightarrow$   $\{[+N],[+\alpha],[-subj,-gov,+obl]\}$
6. /o/  $\longleftrightarrow$   $\{[+N],[+\alpha,+\beta],[-obl]\}$
7. /Ø/  $\longleftrightarrow$   $\{[+N],[-\beta],[-obl]\}$
8. /i/  $\longleftrightarrow$   $\{[+N],[-\alpha],[+obl]\}$
9. /u/  $\longleftrightarrow$   $\{[+N],[-subj,+gov]\}$
10. /a/  $\longleftrightarrow$   $\{[+N]\}$

Whenever an inflection marker does not show up in a *cn* morpheme where it would fit, this is due to blocking by a more specific inflection marker whose specification is also a subset of the specification in *cn*, in accordance with the Subset Principle. The competition of inflection markers in the singular is illustrated in table T<sub>6</sub>. Here, the vocabulary item that is selected under the Subset Principle for insertion in *cn* is given in bold face; markers that fit but are blocked as less specific are given below, in parentheses.

T<sub>6</sub>: *The interaction of inflection markers in the singular in Russian*

	I: [+α,-β]	II: [-α,+β]	III: [-α,-β]	IV: [+α,+β]
nom: [+subj,-gov,-obl]	<b>/Ø/</b> <sub>7</sub> (/a/ <sub>10</sub> )	<b>/a/</b> <sub>10</sub>	<b>/Ø/</b> <sub>7</sub> (/a/ <sub>10</sub> )	<b>/o/</b> <sub>6</sub> (/a/ <sub>10</sub> )
acc: [-subj,+gov,-obl]	<b>/Ø/</b> <sub>7</sub> (/u/ <sub>9</sub> , /a/ <sub>10</sub> )	<b>/u/</b> <sub>9</sub> (/a/ <sub>10</sub> )	<b>/Ø/</b> <sub>7</sub> (/u/ <sub>9</sub> , /a/ <sub>10</sub> )	<b>/o/</b> <sub>6</sub> (/u/ <sub>9</sub> , /a/ <sub>10</sub> )
dat: [-subj,+gov,+obl]	<b>/u/</b> <sub>9</sub> (/a/ <sub>10</sub> )	<b>/e/</b> <sub>4</sub> (/i/ <sub>8</sub> , /u/ <sub>9</sub> , /a/ <sub>10</sub> )	<b>/i/</b> <sub>8</sub> (/u/ <sub>9</sub> , /a/ <sub>10</sub> )	<b>/u/</b> <sub>9</sub> (/a/ <sub>10</sub> )
gen: [+subj,+gov,+obl]	<b>/a/</b> <sub>10</sub>	<b>/i/</b> <sub>8</sub> (/a/ <sub>10</sub> )	<b>/i/</b> <sub>8</sub> (/a/ <sub>10</sub> )	<b>/a/</b> <sub>10</sub>
inst: [+subj,-gov,+obl]	<b>/om/</b> <sub>3</sub> (/a/ <sub>10</sub> )	<b>/oj/</b> <sub>1</sub> (/i/ <sub>8</sub> , /a/ <sub>10</sub> )	<b>/ju/</b> <sub>2</sub> (/i/ <sub>8</sub> , /a/ <sub>10</sub> )	<b>/om/</b> <sub>3</sub> (/a/ <sub>10</sub> )
loc: [-subj,-gov,+obl]	<b>/e/</b> <sub>5</sub> (/a/ <sub>10</sub> )	<b>/e/</b> <sub>4</sub> (/i/ <sub>8</sub> , /a/ <sub>10</sub> )	<b>/i/</b> <sub>8</sub> (/a/ <sub>10</sub> )	<b>/e/</b> <sub>5</sub> (/a/ <sub>10</sub> )

In sum, a decomposition of case and inflection class features has made it possible to fully account for intra- and trans-paradigmatic syncretism in Russian noun inflection, with the exception of /e/,

where two vocabulary items with different specifications must be postulated. I will leave open the question whether this reflects an imperfection of the analysis or an imperfection of the system as such (but see section 8). Let me next turn to the plural.

## 6. Plural

The distribution of markers in the plural across the four inflection classes is shown in table T<sub>7</sub>.

*T<sub>7</sub>: Inflection classes I-IV in the plural*

	I <i>zavod<sub>m</sub></i> (‘factory’)	II <i>komnat<sub>f</sub></i> (‘room’)	III <i>tetrad’<sub>f</sub></i> (‘notebook’)	IV <i>mest<sub>n</sub></i> (‘place’)
nom/pl	zavod-y	komnat-y	tetrad-i	mest-a
acc/pl	zavod-y	komnat-y	tetrad-i	mest-a
dat/pl	zavod-am	komnat-am	tetrad-jam	mest-am
gen/pl	zavod-ov	komnat-Ø	tetrad-ej	mest-Ø
inst/pl	zavod-ami	komnat-ami	tetrad-jami	mest-ami
loc/pl	zavod-ax	komnat-ax	tetrad-jax	mest-ax

The inflection markers for dative, instrumental, and locative plural (/am/, /ami/, and /ax/, respectively) are invariant across inflection classes. There are two markers for [-obl] (nominative/accusative) plural contexts, viz. /a/ and /i/ (focussing on inanimate stems for now). Even though the distribution of /a/ is more restricted than the distribution of /i/, I take the former to be the default marker, as in the singular. It must therefore be possible to refer to complements of natural classes in insertion contexts of vocabulary items (see Zwicky (1970)).<sup>13</sup> Finally, there are two markers for genitive plural contexts:

<sup>13</sup>For present purposes, /i/ could also be considered the default marker; this would avoid a reference to complements of natural classes. However, there is a tendency to replace /i/ with /a/ as the [-obl] plural marker in certain lexical domains in class I (see, e.g., Isačenko (1975, 97-99)); this productive strategy might be taken to indicate a default status of /a/. Further (indirect) justification for taking /a/ as the default marker will be provided in section 8. – As observed by the reviewer, there might be an alternative that avoids reference to complements of natural classes but still maintains default status of /a/: Suppose that /i/ does not

/Ø/ is used by the [+β] classes II and IV, and /ov/ by the [-β] classes I and III.<sup>14</sup> The plural vocabulary items are listed in (9).

(9) *Vocabulary items (plural):*

1. /ax/  $\longleftrightarrow$  { [+N], [+pl], [-subj, -gov, -obl] }
2. /ami/  $\longleftrightarrow$  { [+N], [+pl], [+subj, -gov, +obl] }
3. /am/  $\longleftrightarrow$  { [+N], [+pl], [-subj, +gov, +obl] }
4. /ov/  $\longleftrightarrow$  { [+N], [+pl], [-β], [+subj, +gov, +obl] }
5. /Ø/  $\longleftrightarrow$  { [+N], [+pl], [+β], [+subj, +gov, +obl] }
6. /i/  $\longleftrightarrow$  { [+N], [+pl], [¬(+α, +β)], [-obl] }
7. /a/  $\longleftrightarrow$  { [+N], [+pl], [-obl] }

The competition between vocabulary items for insertion in *cn* plural contexts is minimal; it is shown in table T<sub>8</sub>.<sup>15</sup>

At this point, a general conclusion concerning the decomposition of inflection class features can be drawn: For each natural class of inflection classes, there is in fact an insertion context of an inflection marker that refers to it: [+α] (I, IV) is referred to by the singular markers /om/<sub>3</sub> and /e/<sub>5</sub>; [-α] (II, III) by the singular marker /i/<sub>8</sub>; [+β] (II, IV) by the plural marker /Ø/<sub>5</sub>; and [-β] (I, III) by the singular marker /Ø/<sub>7</sub> and by the plural marker /ov/<sub>4</sub>. In contrast, no marker needs to make reference to pairs of inflection classes that do not form a natural class.

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bear class information at all (only the case feature [-obl]), and that /a/ is radically underspecified, i.e., [-obl]-less. Then, an impoverishment rule (of the type used in section 7 below) might remove the [-obl] specification in class IV, and force choice of /a/ in this context, with more specific /i/ emerging in classes I, II, and III. The choice between these two options is not entirely straightforward (but see the remarks on the role of impoverishment in section 7); for present purposes, I will leave the matter undecided.

<sup>14</sup>I follow Halle (1994, 53ff) in assuming that there is a morpho-phonological rule that accounts for /ov/ being realized as *ej* under certain conditions.

<sup>15</sup>Do singular and plural markers compete? Plural markers do not fit into singular contexts; their insertion would violate clause (i) of the Subset Principle, due to a feature clash: There is a [+pl] feature in the specification of a plural marker, and a [-pl] feature on the *cn* morpheme. In contrast, singular markers do in principle compete in plural contexts because they are not specified for number (by assumption). Still, since singular markers do not have a number feature, they can never become the most specific markers for a given context, due to the high ranking of number on the hierarchy of features in (5).

*T*<sub>8</sub>: The interaction of inflection markers in the plural in Russian

	I: [+α,-β]	II: [-α,+β]	III: [-α,-β]	IV: [+α,+β]
nom: [+subj,-gov,-obl]	/i/ <sub>6</sub> (/a/ <sub>7</sub> )	/i/ <sub>6</sub> (/a/ <sub>7</sub> )	/i/ <sub>6</sub> (/a/ <sub>7</sub> )	/a/ <sub>7</sub>
acc: [-subj,+gov,-obl]	/i/ <sub>6</sub> (/a/ <sub>7</sub> )	/i/ <sub>6</sub> (/a/ <sub>7</sub> )	/i/ <sub>6</sub> (/a/ <sub>7</sub> )	/a/ <sub>7</sub>
dat: [-subj,+gov,+obl]	/am/ <sub>3</sub>	/am/ <sub>3</sub>	/am/ <sub>3</sub>	/am/ <sub>3</sub>
gen: [+subj,+gov,+obl]	/ov/ <sub>4</sub>	/Ø/ <sub>5</sub>	/ov/ <sub>4</sub>	/Ø/ <sub>5</sub>
inst: [+subj,-gov,+obl]	/ami/ <sub>2</sub>	/ami/ <sub>2</sub>	/ami/ <sub>2</sub>	/ami/ <sub>2</sub>
loc: [-subj,-gov,+obl]	/ax/ <sub>1</sub>	/ax/ <sub>1</sub>	/ax/ <sub>1</sub>	/ax/ <sub>1</sub>

## 7. Animacy

The system developed so far does not yet have anything to say about accusative/genitive syncretism with animates in class I in the singular; compare *student-a* ('student') with \**student-Ø* in accusative singular contexts (see *T*<sub>1</sub>). The same effect occurs with animates in the plural throughout; see, e.g., the accusative plural forms *student-ov* ('students') vs. \**student-y* in class I, *učitel'nic-Ø* ('teachers') vs. \**učitel'nic-y* in class II, *myš-ej* ('mice') vs. \**myš-i* in class III, and *suščestv-Ø* ('creature') vs. \**suščestv-a* in class IV. Given the assumptions so far, Subset Principle-driven vocabulary insertion would seem to predict the starred forms in all these cases.

There is reason to assume that this animacy-driven syncretism does not have the same source as the instances of syncretism discussed so far, and that it should not be traced back to case feature underspecification in insertion contexts associated with vocabulary items. The reason is that an underspecification approach would classify the animacy effect as an accidental outcome of the interaction of independent inflection markers, rather than as the general, system-defining regularity that it seems to be. To express this overarching regularity, an impoverishment rule can be adopted. Impoverishment rules manipulate syntactic feature specifications before vocabulary insertion applies (see Bonet (1991), Bobaljik (2002), and Framp-ton (2002), among others)). Standardly, impoverishment is taken to



*delete* features (as the name suggests), thereby forcing a retreat to the general case (i.e., insertion of less specific markers). However, this will not do in the case at hand: The plural markers /i/₆ and /a/₇ in (9) are less specific than the markers /ov/₄ and /Ø/₅ (that they need to be replaced by in animate contexts). Therefore, I follow Noyer (1998, 282) in assuming that impoverishment rules can also *change* features (or at least feature values). For concreteness, I adopt the two impoverishment rules in (10-a) (for class I) and (10-b) (for the plural) that bring about a change in the feature specifications of *cn* morphemes: a feature bundle [-subj,-obl] is changed to [+subj,+obl].

- (10) a. [-subj,-obl] → [+subj,+obl] / [+α,-β],[+anim]\_\_  
 b. [-subj,-obl] → [+subj,+obl] / [+pl],[+anim]\_\_

These rules turn a syntactic accusative context into a morphological genitive context (leaving the shared feature [+gov] unaffected) and thus account for the animacy-driven presence of genitive markers in accusative environments in class I and in the plural.<sup>16</sup>

## 8. Form and Function

Closer inspection of the lists of vocabulary items in (8) and (9) reveals an interesting correlation of form and function of inflection markers: From top to bottom, the specificity of the inflection markers decreases.<sup>17</sup> In contrast, the sonority of the markers increases. Thus, it seems that the more specific an inflection marker is, the lower is its

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<sup>16</sup>The two readjustment rules proposed in Halle (1994) have essentially the same effect. Harley & Noyer (2003, 478) note that “feature-changing impoverishment [...] has approximately the same power as rules of referral”. Indeed, referral rules that are comparable in their scope with the impoverishment rules in (10) are assumed in Corbett & Fraser (1993), Stump (2001), and Müller (2003a).

<sup>17</sup>At least as a strong tendency. There is some minor blurring of this with the singular markers /om/, /e/, and /o/ in (8), where the specificity-based order would be 4.-6.-3.-5. The order of the plural markers in (9) fully follows decreasing specificity if we make two assumptions: First, the complement specification of /i/ counts as a single inflection class feature; and second, the dative, instrumental, and locative markers /am/, /ami/, and /ax/, being invariant across inflection classes and thus exhibiting an agglutinative-like status, simply do not interact with the other plural markers, and therefore inherently qualify as maximally specific.

rank on the sonority hierarchy: The vocalic marker /a/ is least specific and most sonorous; consonantal markers like /oj/ and /ju/ are most specific and least sonorous; and the remaining vocalic markers show intermediate degrees of specificity and sonority, with, e.g., /i/ emerging as more specific and less sonorous than /u/, and /u/ as more specific and less sonorous than /a/.<sup>18</sup>

There are some apparent exceptions to the generalization that sonority increases from top to bottom in (8) and (9). First, /e/ seems to stand out in (8) because its two occurrences qualify as quite specific, much more so than, say, /i/; however, /e/ is clearly more sonorous than /i/. This potential problem disappears when we take into account that /e/ is in fact usually (except after consonants like /c/, /š/, /ž/, and abstracting away from reduction effects) realized with an initial glide, which makes this marker quasi-consonantal. (This may eventually shed light on why it is exactly the syncretism with /e/ that is not fully resolved in the present approach.)

A second potential problem is posed by the null marker: /Ø/ occupies an intermediate position with respect to specificity in both (8) and (9), even though the sonority hierarchy would seem to support an edge position for this marker. This problem is solved when we follow Halle (1994), who suggests that the “null marker” /Ø/ is in fact an abstract yer vowel /O/, which is independently motivated in the morphophonology of Russian. Halle argues that an abstract /O/ vowel has otherwise the same features as /o/; there is a general rule that deletes abstract vowels unless they immediately precede a syllable with another abstract vowel (which, of course, they never do if they are inflection markers at the end of a word). Thus, /O/ can be assumed to replace the the null marker /Ø/ assumed so far. Of course, given that /O/ and /o/ have a similar sonority status, they can be expected to exhibit a similar degree of specificity.

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<sup>18</sup>A correspondence of form and function in the Russian noun inflection system has been noted before, by Shapiro (1969, 14) and Plank (1979, 143). Both authors correlate a hierarchy of cases  $H_c$  and a sonority hierarchy  $H_s$ . Plank states: “The higher-ranked a case is in  $[H_c]$ , the more sonorous is the set of phonological segments used for its expression.” I would claim that replacing this hierarchy of cases with a hierarchy of specifications of decomposed case and inflection class features permits a more articulate (and verifiable) account that nevertheless preserves Plank’s and Shapiro’s basic insight.

Some minor discrepancies between specificity and sonority of markers may eventually remain.<sup>19</sup> All in all, however, a correlation of form and function seems hard to deny for the system of Russian noun inflection. This correlation can be taken to suggest that a notion like optimal grammar design plays a role in inflectional morphology, and that, in addition to the Syncretism Principle in (1), fusional systems of inflection might adhere to a second, related meta-grammatical Iconicity Principle that differs from the Syncretism Principle only in that the concept of “identity” is replaced with the concept of “similarity”, and that may plausibly be assumed to guide (and simplify) acquisition of inflectional systems in the same way:

- (11) *Iconicity Principle*:  
 Similarity of form implies similarity of function  
 (in a domain  $\Sigma$ , and unless there is evidence to the contrary).

## References

- Alexiadou, Artemis & Gereon Müller (2003): Class Features as Probes. Ms., Universität Stuttgart and IDS Mannheim.
- Anderson, Stephen (1992): *A-Morphous Morphology*. Cambridge University Press, Cambridge.
- Baerman, Matthew, Dunstan Brown & Greville Corbett (2002): Case Syncretism in and out of Indo-European. In: M. Andronis, C. Ball, H. Elston & S. Neuvel, eds., *The Main Session. Papers from the 37th Meeting*. Vol. 1, Chicago Linguistic Society, Chicago, pp. 15–28.
- Bailyn, John Frederick (2003): GENitive Case Is (Always) Quantificational. Ms., SUNY at Stony Brook.
- Bailyn, John Frederick & Andrew Nevins (2003): The Form of Russian Genitive Plurals. Ms., SUNY at Stony Brook and MIT.
- Bierwisch, Manfred (1967): Syntactic Features in Morphology: General Problems of So-Called Pronominal Inflection in Ger-

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<sup>19</sup>In particular, the sonority-based order /u/ > /o/ predicted by (8) seems incompatible with the sonority-based order /o/ > /u/ argued for in Matthews (1974), Ross (1980), Kenstowicz (1994), and Crosswhite (2000).

- man. In: *To Honour Roman Jakobson*. Mouton, The Hague/Paris, pp. 239–270.
- Blevins, James (1995): Syncretism and Paradigmatic Opposition, *Linguistics and Philosophy* 18, 113–152.
- Bobaljik, Jonathan (2002): Syncretism without Paradigms: Remarks on Williams 1981, 1994. In: G. Booij & J. van Marle, eds., *Yearbook of Morphology 2001*. Kluwer, Dordrecht, pp. 53–85.
- Bonet, Eulália (1991): Morphology after Syntax. PhD thesis, MIT, Cambridge, Mass.
- Carstairs, Andrew (1987): *Allomorphy in Inflection*. Croom Helm, London.
- Chomsky, Noam (2001): Derivation by Phase. In: M. Kenstowicz, ed., *Ken Hale. A Life in Language*. MIT Press, Cambridge, Mass., pp. 1–52.
- Chvany, Catherine (1986): Jakobson's Fourth and Fifth Dimensions. In: R. Brecht & J. Levine, eds., *Case in Slavic*. Slavica Publishers, Columbus, Ohio, pp. 107–129.
- Corbett, Greville & Norman Fraser (1993): Network Morphology: A DATR Account of Russian Nominal Inflection, *Journal of Linguistics* 29, 113–142.
- Crosswhite, Katherine (2000): Sonority-Driven Reduction. Ms., University of Rochester. To appear in *Proceedings of BLS 26*.
- Frampton, John (2002): Syncretism, Impoverishment, and the Structure of Person Features. Ms., Northeastern University. To appear in *Papers from the 2002 Chicago Linguistics Society Meeting*.
- Franks, Steven (1995): *Parameters of Slavic Morphosyntax*. Oxford University Press, New York and Oxford.
- Fraser, Norman & Greville Corbett (1994): Gender, Animacy, and Declensional Class Assignment: A Unified Account for Russian. In: G. Booij & J. van Marle, eds., *Yearbook of Morphology 1994*. Kluwer, Dordrecht, pp. 123–150.
- Halle, Morris (1992): The Latvian Declension. In: G. Booij & J. van Marle, eds., *Yearbook of Morphology 1991*. Kluwer, Dordrecht, pp. 33–47.
- Halle, Morris (1994): The Russian Declension: An Illustration of the Theory of Distributed Morphology. In: J. Cole & C. Kisseberth, eds., *Perspectives in Phonology*. CSLI Publications, Stan-

- ford, pp. 29–60.
- Halle, Morris (1997): Distributed Morphology: Impoverishment and Fission. In: B. Bruening, Y. Kang & M. McGinnis, eds., *Papers at the Interface*. Vol. 30, MITWPL, pp. 425–449.
- Halle, Morris & Alec Marantz (1993): Distributed Morphology and the Pieces of Inflection. In: K. Hale & S. J. Keyser, eds., *The View from Building 20*. MIT Press, Cambridge, Mass., pp. 111–176.
- Harley, Heidi & Rolf Noyer (2003): Distributed Morphology. In: L. Cheng & R. Sybesma, eds., *The Second GLOT International State-of-the-Article Book*. Mouton de Gruyter, Berlin, pp. 463–496.
- Isačenko, Alexander (1975): *Die russische Sprache der Gegenwart*. Max Hueber Verlag, München.
- Jakobson, Roman (1962a): Beitrag zur allgemeinen Kasuslehre. Gesamtbedeutungen der russischen Kasus. In: *Selected Writings*. Vol. 2, Mouton, The Hague and Paris, pp. 23–71.
- Jakobson, Roman (1962b): Morfologičeskije Nabljudenija. In: *Selected Writings*. Vol. 2, Mouton, The Hague and Paris, pp. 154–181.
- Kenstowicz, Michael (1994): Sonority-Driven Stress. Ms., MIT.
- Kiparsky, Paul (1973): ‘Elsewhere’ in Phonology. In: S. Anderson & P. Kiparsky, eds., *A Festschrift for Morris Halle*. Academic Press, New York, pp. 93–106.
- Lumsden, John (1992): Underspecification in Grammatical and Natural Gender, *Linguistic Inquiry* 23, 469–486.
- Matthews, Peter (1974): *Morphology*. Cambridge University Press, Cambridge.
- McCreight, Katherine & Catherine Chvany (1991): Geometric Representation of Paradigms in a Modular Theory of Grammar. In: F. Plank, ed., *Paradigms*. Mouton de Gruyter, Berlin, pp. 91–111.
- Müller, Gereon (2003a): On Decomposing Inflection Class Features. Ms., IDS Mannheim. To appear in L. Gunkel, G. Müller and G. Zifonun, eds., *Explorations in Nominal Inflection*. Berlin: Mouton de Gruyter.
- Müller, Gereon (2003b): Syncretism and Iconicity in Icelandic Noun Declensions: A Distributed Morphology Approach. Ms., IDS Mannheim.

- Neidle, Carol (1988): *The Role of Case in Russian Syntax*. Kluwer, Dordrecht.
- Neset, Tore (1994): A Feature-Based Approach to Russian Noun Inflection, *Journal of Slavic Linguistics* 2, 214–237.
- Noyer, Rolf (1992): Features, Positions, and Affixes in Autonomous Morphological Structure. PhD thesis, MIT, Cambridge, Mass.
- Noyer, Rolf (1998): Impoverishment Theory and Morphosyntactic Markedness. In: S. Lapointe, D. Brentari & P. Farrell, eds., *Morphology and its Relation to Phonology and Syntax*. CSLI, Palo Alto, pp. 264–285.
- Oltra Massuet, Isabel (1999): On the Notion of Theme Vowel: A New Approach to Catalan Verbal Morphology. Master of science thesis, MIT, Cambridge, Mass.
- Plank, Frans (1979): Ikonisierung und De-Ikonisierung als Prinzipien des Sprachwandels, *Sprachwissenschaft* 4, 121–158.
- Ross, John (1980): Ikonismus in der Phraseologie, *Zeitschrift für Semiotik* 2, 39–56.
- Shapiro, Michael (1969): *Aspects of Russian Morphology*. Slavica Publishers, Cambridge, Mass.
- Stump, Gregory (2001): *Inflectional Morphology*. Cambridge University Press, Cambridge.
- Wiese, Bernd (2001): Zur lateinischen Deklination: Die Form-Funktions-Beziehung. Ms., IDS Mannheim.
- Wiese, Bernd (2003): Categories and Paradigms: On Underspecification in Russian Declension. Ms., IDS Mannheim. To appear in L. Gunkel, G. Müller and G. Zifonun, eds., *Explorations in Nominal Inflection*. Berlin: Mouton de Gruyter.
- Williams, Edwin (1994): Remarks on Lexical Knowledge, *Lingua* 92, 7–34.
- Wunderlich, Dieter (1996): Minimalist Morphology: The Role of Paradigms. In: G. Booij & J. van Marle, eds., *Yearbook of Morphology 1995*. Kluwer, Dordrecht, pp. 93–114.
- Wunderlich, Dieter (2002): Is There Any Need for the Concept of Directional Syncretism?. Ms., Universität Düsseldorf. To appear in L. Gunkel, G. Müller and G. Zifonun, eds., *Explorations in Nominal Inflection*. Berlin: Mouton de Gruyter.
- Wurzel, Wolfgang Ullrich (1984): *Flexionsmorphologie und Natur-*

- lichkeit*. Akademie Verlag, Berlin.
- Zwicky, Arnold (1970): Class Complements in Phonology, *Linguistic Inquiry* 1, 262–264.
- Zwicky, Arnold (1991): Systematic versus Accidental Phonological Identity. In: F. Plank, ed., *Paradigms: The Economy of Inflection*. Mouton de Gruyter, pp. 113–132.