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**Domains of Syncretism:
A Demonstration of the Autonomy of Morphology**

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To the memory of Robert Coleman (1929-2001)

1 Introduction

If we view inflectional morphology as a means for conveying grammatical information, we might have certain reasonable assumptions about how systems of inflectional morphology would be structured. We might expect that all cells of a paradigm would be distinct, since this is an obvious way to give the hearer the best chance of deducing the intended grammatical information. Yet paradigms are frequently not structured like that, rather we find identities between cells, or 'syncretisms'. These deserve investigation, and the current authors are therefore working on a general typology of syncretism.¹ This paper charts one part of that typology, the domains within which syncretism may be found; this work led us to an additional argument for the autonomy of morphology.

2 Definitions of syncretism

Linguists first used the term in a diachronic sense, and it continues in this use. For example, Bloomfield (1933: 388) glosses it as 'the merging of inflectional categories' as a result of sound-change. It later gained a synchronic sense, from at least the time of Jakobson (1936/1990: 370), but its range of usage varies considerably. Spencer (1991: 45) gives the following: 'Russian adjectives display syncretism, that is, a single inflected form may correspond to more than one morphosyntactic description.' Consider the data in (1).

- (1) An instance of syncretism in Russian (phonological transcription)²

	SG
NOM	karta 'map'
ACC	kartu

	SG
NOM	zakon 'law'
ACC	zakon

From the noun *karta* 'map' we see that Russian distinguishes accusative from nominative.³ However, *zakon* 'law' fails to make the distinction; it shows syncretism. Hence syncretism is the absence of a formal distinction which can be found elsewhere in the same language. Our task is to give the domain of a syncretism like this, that is, to divide the instances like *zakon* from those where there is no syncretism. More generally, we wish to establish the principles

¹ For details see the SMG web page: <http://www.surrey.ac.uk/LIS/SMG/>

² Here and in other Russian examples we use morphophonemic transcription.

available, according to which a language may determine any given syncretism. Little research has been done in this area, but we have drawn on two pioneering papers by Robert Coleman (1976, 1991).

3 Network Morphology

Our analysis is within the Network Morphology framework, for which see, for instance, Corbett and Fraser (1993, 2000), Fraser and Corbett (1995, 1997), Brown, Corbett, Fraser, Hippisley and Timberlake (1996), Brown (1998a, b, c), Evans, Brown, and Corbett (1998, forthcoming a, b) and Hippisley (1998, 2001). According to Stump's (2001) characterization, it is an inferential-realizational theory, that is, it belongs in the Word and Paradigm family. Network Morphology makes extensive use of the notion of default inheritance, and is careful to distinguish types of default (see Fraser and Corbett 1997, Brown 1998b). There is a commitment to implementing fragments, in order to demonstrate that analyses are valid, and this is done using the lexical knowledge representation language DATR (Evans and Gazdar 1996, Gazdar forthcoming).

As a brief introduction, consider the following Russian noun paradigms.

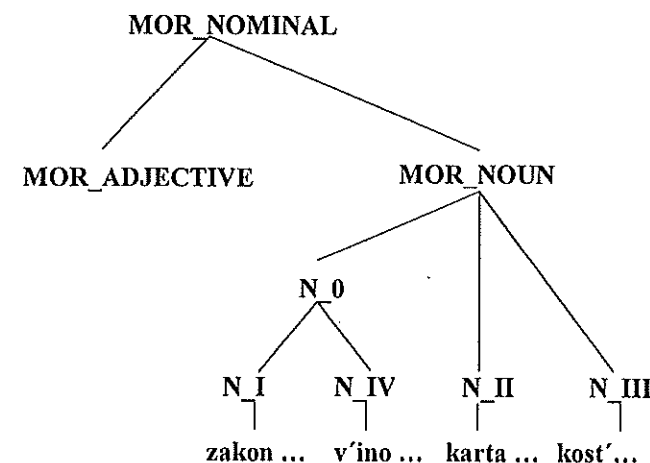
(2) Main paradigms of Russian nouns

	zakon	komnata	kost'	v'ino
<i>singular</i>	'law'	'room'	'bone'	'wine'
NOM(inative)	zakon	komnata	kost'	v'ino
ACC(usative)	zakon	komnatu	kost'	v'ino
GEN(itive)	zakona	komnati	kost'i	v'ina
DAT(ive)	zakonu	komnate	kost'i	v'inu
INST(rumental)	zakonom	komnatoj	kost'ju	v'inom
PREP(ositional)	zakone	komnate	kost'i	v'ine
<i>plural</i>				
NOM	zakoni	komnati	kost'i	v'ina
ACC	zakoni	komnati	kost'i	v'ina
GEN	zakonov	komnat	kostej	v'in
DAT	zakonom	komnatam	kost'am	v'inam
INST	zakonom'i	komnatam'i	kost'am'i	v'inam'i
PREP	zakonax	komnatax	kost'ax	v'inax
	I	II	III	IV

Here we see four paradigms which, in a traditional account, might be treated as monolithic units. In a default inheritance account, we would analyse the oblique plural forms as being shared across the paradigms; thus the dative plural of a noun consists of its stem plus *-am*, irrespective of inflectional class. We would also treat the nominative plural as being stem plus *-i*, with this being overridden just for inflectional class IV. At a lower level, we would capture the shared forms of inflectional classes I and IV. That is, we would have a hierarchy of defaults, the highest applying very generally, in fact applying to more than just nouns, the

lowest having smaller domains, and at the bottom of the hierarchy would be lexical items which must contain some idiosyncratic information. A possible structure is given in Figure 1.

Figure 1: An Inheritance Structure for Russian Nominals



In addition to the four lexical items given, there are thousands of other nouns which inherit from the four inflectional class nodes. For the detail see Corbett and Fraser (1993), for a fuller implementation see Brown (1998a).⁴ For the purposes of this paper, the relevance of this approach is that it suggests a range of possible domains for syncretism.

4 Domains of syncretism

Given that we find numerous instances of syncretism, what are the possible domains? We first separate off phonology, and then move to the central potential domains.

4.1 Phonologically determined 'syncretism'

Those who write on syncretism typically exclude instances which result solely from phonological rule. Consider this Russian example.

⁴ The fragment *rusnoms.dtr* at the Sussex DATR archive

<http://www.cogs.sussex.ac.uk/lab/nlp/datr/datr.html> precedes Brown (1998a), but still involves separate hierarchies (see §4.4.1). Corbett & Fraser (1993) gave a single hierarchy. Later papers use a network of hierarchies; in particular a syntactic hierarchy is added, which is concerned with the syntactic category of items; by default items which are, for example, syntactic nouns will inherit information from the noun section of the morphological hierarchy, but this is not always so.

(3) Russian *boloto* 'swamp'

	singular	plural
NOM	bolóto (bolót['])	bolóta (bolót['])

These two forms are indistinguishable phonetically, as a result of Russian's general rules for reduction of unstressed vowels. In similar nouns which are end-stressed, there is a clear distinction; hence a morphological analysis treats the forms in (5) as distinct. Such instances are normally excluded from discussions of syncretism; we agree with this move, but wish to be explicit about it.

4.2 Lexically determined syncretism

Consider the paradigm of Italian *essere* 'be'.

(4) Italian *essere* 'be' in comparison with regular verb

	singular	plural		singular	plural
1	sono	siamo	1	parlo	parliamo
2	sei	siete	2	parli	parlate
3	è	sono	3	parla	parlano

According to Davide Ricca (personal communication) the verb *essere* 'be', which has first person singular and third person plural both as *sono*, is the only verb in the language to do so. This then is a case of lexically determined syncretism, which is equivalent to Coleman's first degree syncretism (1991). Other languages show further unique syncretisms, though these are rare. In principle the situation is the same, whether it affects a single item, or several items in an unmotivated way: that is, the syncretism would need to be specified in the lexical entry for each of them. Here is a further example of lexically determined syncretism. Numerals in Russian vary in the number of case distinctions made, but the normal minimal paradigm distinguishes three forms. Consider these numerals against that general background:

(5)	NOM	sorok 'forty'	sto 'hundred'	dev'anosto 'ninety'
	ACC	sorok	sto	dev'anosto
	GEN	soroka	sta	dev'anosta
	DAT	soroka	sta	dev'anosta
	INST	soroka	sta	dev'anosta
	PREP	soroka	sta	dev'anosta

While syncretism of nominative and accusative is widespread in Russian numerals, syncretism of all the remaining case forms is unusual, and is the only morphological feature these items have in common. This combination of

syncretisms including the instrumental must be lexically specified for these three items only.⁵

4.3 Morphologically determined syncretism

We consider morphological domains, starting from the smallest.

4.3.1 Syncretism within a single inflectional class

(6) Russian

NOM	kost' 'bone'
ACC	kost'
GEN	kost'i
DAT	kost'i
INST	kost'ju
PREP	kost'i

Here we find, among other things, identity of the prepositional and genitive singular. We could reflect this in the lexical entry. However, we would be suggesting, counter-factually, that the identity is an idiosyncratic fact about the particular noun *kost'* 'bone', which is not shared with other items, in other words that the syncretism is lexically determined. In fact the syncretism of prepositional and genitive singular is one of the characteristics shared by all members of the inflectional class (Coleman's 1991 second degree syncretism). We should therefore state this syncretism at a higher point in the inheritance hierarchy (Figure 1), at the node *N_III*, from which *kost'* inherits (as do over 4000 other nouns).

4.3.2 A subset of the inflectional classes of a word class

In Russian, as can be seen in (7), dative and prepositional singular are identical in two inflectional classes (II and III).

(7)	NOM	karta 'map'	kost' 'bone'
	ACC	kartu	kost'
	GEN	karti	kost'i
	DAT	karte	kost'i
	INST	kartoj	kost'ju
	PREP	karte	kost'i

While the case forms are identical within the inflectional classes, the affixes involved differ between inflectional classes.

⁵ *Sorok* 'forty' and *sto* 'hundred' are the clear cases; because of vowel reduction all the forms of *dev'anosto* 'ninety' are pronounced identically, thus there is an additional phonologically induced syncretism of the nominative and accusative with all the other cases, giving only one phonological form for this item.

4.3.3 Throughout one word class

In Slovene, the accusative dual and genitive dual are syncretic for the morphologically heterogeneous personal pronouns, but not for nouns and adjectives (which have syncretism of nominative dual and accusative dual, see §4.3.5). We discuss in §4.4.1 whether 'word class' is indeed a morphological domain.

4.3.4 Across more than one word class

In Russian all adjectives and pronouns have genitive plural syncretic with the prepositional plural. This does not extend to nouns, where the inflections are distinct.

4.3.5 Across all potentially relevant word classes

Again in Slovene, the dative dual and instrumental dual are syncretic for nouns, adjectives and pronouns (Priestly 1993: 399). That is to say, they are syncretic for anything which can mark them. No lexical item of Slovene has a dative dual which is distinct from the instrumental dual.

The type of inheritance hierarchy illustrated in Figure 1 suggested possible morphological domains for syncretism, and we have found instances of all of them, which is a positive point for this approach to morphology. We now move on to consider non-morphological domains.

4.4 Candidates for syntactically determined syncretism

There are various types of situation which at first appear to be syntactic domains. On closer examination they seem to us to be better analysed in other ways. We give four examples here.

4.4.1 Syntactic categories

In the earlier discussion we talked of 'noun', 'adjective' and so on, which suggests that syntactic categories can provide the domain for syncretism. However, in note 4, it was pointed out that the hierarchy given in Figure 1 simplifies the position. We need a separate hierarchy for syntactic categories, though by default items in a given category inherit their morphological information from a node dominated by a corresponding morphological category (nouns from MOR_NOUN, adjectives from MOR_ADJECTIVE, and so on). The question then arises as to what happens when syntactic and morphological categories fail to match. Which provides the domain for syncretism? Slavonic provides helpful data here. Consider Russian items like *stolovaja* 'dining room', and *nasekomoe* 'insect'. Syntactically these behave like nouns. However, they behave morphologically as adjectives.

(8) Russian nouns and adjectives

	karta	stolovaja	novaja
	'map'	'dining room'	'new' (fem. sg.)
syntactically	NOUN	NOUN	ADJ
morphologically	NOUN	ADJ	ADJ
NOM	karta	stolovaja	novaja
ACC	kartu	stolovuju	novuju
GEN	karti	stolovoj	novoj
DAT	karte	stolovoj	novoj
INST	kartoj	stolovoj	novoj
PREP	karte	stolovoj	novoj

The syncretisms found with morphological nouns and morphological adjectives are different in Russian. *Stolovaja* 'dining room' and similar items have the syncretism of morphological adjectives. This shows that it is the morphological category which provides a domain for syncretism. To demonstrate that a syntactic category is a possible domain, we would need to find the converse situation to that found in Russian, that is, a situation in which morphological category and syntactic category differed for certain items, and where these items took the syncretisms appropriate for the syntactic category but not for the morphological category.

4.4.2 Morpho-syntactic features

Here we are concerned with features which may have a role both in morphology and in syntax. (They are to be distinguished from purely morphological features, such as features indicating inflectional class.) Typical examples are number and gender, which are relevant to syntax, notably in agreement, and also to morphology. To see the role of such features we shall consider the interesting issue of animacy (for work on this see among others Perlmutter & Orešnik 1973, Huntley 1980, Corbett & Fraser 1993).

The table under (9) includes two examples for each of the four main inflectional classes (see (2) above); each of the eight examples is representative of a group of nouns. If we look at any of the examples individually, we find an instance of syncretism. Take just the first example, *student*. There is syncretism of accusative and genitive singular (conditioned by animacy).

(9) The morphological effect of animacy in Russian (phonological transcription)

	student	zakon	učitel'n'ica	karta	miš	kost'	č'udov'išč'o	v'ino
	'student'	'lav'	'teacher (f.)'	'map'	'mouse'	'bone'	'monster'	'wine'
	animate	inan.	animate	inan.	animate	inan.	animate	inan.
<i>singular</i>								
NOM	student	zakon	učitel'n'ica	karta	miš	kost'	č'udov'išč'o	v'ino
ACC	studenta	zakon	učitel'n'icu	kartu	miš	kost'	č'udov'išč'o	v'ino
GEN	studenta	zakona	učitel'n'ici	karti	miši	kost'i	č'udov'išč'a	v'ina
<i>plural</i>								
NOM	studenti	zakoni	učitel'n'ici	karti	miši	kost'i	č'udov'išč'a	v'ina
ACC	studentov	zakoni	učitel'n'ic	karti	mišej	kost'i	č'udov'išč'	v'ina
GEN	studentov	zakonov	učitel'n'ic	kart	mišej	kostej	č'udov'išč'	v'in

More generally, the singular accusative depends on the gender and animacy of the item in question, and the plural accusative on the animacy of the item in question. Evaluation of this information allows us to state that the singular accusative of masculine animates is the same as the singular genitive, and the plural accusative of animates is the same as the genitive.

The different inflectional paradigms in (9) share the same *pattern* of identity, even though the particular inflections differ. It would clearly be inadequate to state the identity of forms separately for each inflectional class; that would imply that the cases involved could equally well differ from inflectional class to inflectional class. This regularity is captured in the Network Morphology account by a statement high up the inheritance tree. Since animacy affects the agreement of adjectives, and the form of pronouns, the logical place for it would be at the top of the hierarchy in Figure 1, namely at the MOR NOMINAL node.

There are two questions here, the first is the type of feature we are dealing with, and the second, our main concern, is the domain of syncretism. Animacy appears to be a semantic feature, in that the nouns involved denote entities which live and move (thus insects are animate but plants are not). The match with this semantic definition is close in Russian (less so in some other Slavonic languages). There are some interesting borderline cases, for instance *pokojniki* 'the deceased' is grammatically animate. Such instances are animate for agreement purposes and for the morphological matter of syncretism. But we should also capture the fact that the personal pronouns regularly have accusative-genitive syncretism, whether or not they are referring to an animate entity. This may be captured by stipulating that they are grammatically animate. Our conclusion is that the animacy feature is a morphosyntactic one (albeit one with strong semantic motivation in Russian, and with lesser semantic motivation in some other Slavonic languages). In any case, while animacy is a major determining feature for accusative-genitive syncretism, the syncretism depends on the interaction of animacy with number and gender (see Fraser and Corbett 1995 for more details). Moreover, it is overridden by morphological considerations (inflectional class II nouns have accusative singular in *-u* irrespective of animacy). In our previous examples the domain given uniquely specified the syncretism in question. The animacy feature

does not do this. What then is the domain of the syncretism we have just examined? We return to this issue in §5 below.

4.4.3 German adjectives

German adjectives show greater or lesser syncretism, depending on the syntactic environment (see Zwicky 1986 for an analysis). Essentially they have two possible inflectional possibilities, 'strong' and 'weak' (the latter also available for nouns). The choice of one or other set of inflections is conditioned by the particular determiner in the phrase. This choice entails particular syncretisms, but the syntactic environment is not directly the domain for the syncretism.⁶

4.4.4 The Finnish accusative

In Finnish, personal pronouns have a distinct accusative form, whereas other nominals do not: in the plural for these it is identical to the nominative, while in the singular it is identical to the genitive *or* the nominative.

(10) The accusative in Finnish pronouns and nouns

	Pronoun	Noun
	'I'	'girl'
NOM	minä	tyttö
ACC	minut	tyttö/tytön
GEN	minun	tytön

The conditions for the choice of the nominative or the accusative form would appear to be syntactic: the nominative form is used if the verb is an imperative, infinitive or the subjectless quasi-passive, otherwise the genitive form is used; Kiparsky's (2001) analysis makes this alternation dependent on whether or not the verb is capable of expressing an overt subject. Crucially, however, this phenomenon is still subject to morphological restrictions, in as much as it does not affect personal pronouns, which belong to a distinct declension class (characterized, *inter alia*, by an overt accusative marker and the absence of comitative and instrumental forms).

We have taken the most likely 'contenders' and find in each case that, while syntax may have an influence, it never uniquely determines the domain of syncretism in the way that the domains examined earlier were determined.

4.5 Semantically determined syncretism

It is logical to ask whether syncretism can be determined by semantics. Slavonic appeared to have a possible instance, we noted above that syncretism determined

⁶ Analogously, we have seen that the accusative case in Russian is often syncretic, but we would not therefore say that verbs which take the accusative determine the domain for that syncretism.

by animacy in Slavonic is subject to a morphosyntactic feature rather than a semantic one.

As Claire Bowern points out (personal communication) there are instances in various languages of place names having their nominative form identical to the locative. However, these are typically instances of lexically determined syncretism: individual items have the syncretism, but not all the items in a semantic class.

In Tsez, proper nouns denoting places, provided they are native words, will have the absolutive identical to one of six local cases (Bernard Comrie, personal communication). For example, *asaq* 'Asakh' includes the marker *-q* 'on (a vertical surface)' and may function both as an absolutive and as a local case. Hence the semantic type allows the prediction that there will be a syncretism, but does not determine which case will be involved, since this varies from place name to place name. Moreover, though the form may be used as an absolutive, speakers show some reluctance here, and prefer to use the name in apposition to a common noun, which has a clear absolutive. Here again, then, semantics does not uniquely determine a domain of syncretism.

To date we have not found a language in which a noun denoting a place will necessarily have a specific syncretism. And in general, we have not found instances of semantics uniquely providing a domain for syncretism.

5 Hierarchical versus orthogonal specification of syncretism

The clearest domains we have encountered were well described in terms of an inheritance hierarchy, along the lines of Figure 1. However, the interesting data on animacy prove significantly different. The point is that generalizations about syncretism determined by animacy can be stated at the level of MOR_NOMINAL in our hierarchy, and they apply to different paradigms, giving identities of pattern rather than any phonological identity. On the other hand, when we stated earlier the domain of a particular syncretism, this meant that all the items included in that domain showed the syncretism. It is not the case that accusative-genitive syncretism is found with all items in the nominal domain, rather only those that are animate (whether as a result of their semantics, or being specified as animate, or being marked as animate as a consequence of agreement). Thus the specification is orthogonal to the specification for inflectional class. This captures the common-sense view that we do not wish to claim there are eight inflectional classes for nouns in Russian, rather that there are four, with animacy affecting each of them.

The natural way of thinking of domains is in hierarchical terms, and this was our approach in §4.3. However, syncretism may require to be specified orthogonally to the morphological hierarchy. How then does such orthogonal specification of syncretism differ from lexical specification? Lexical specification means that the individual items must each be specified, in other words that they are exceptional in this regard. Orthogonal specification can be regular (animacy syncretism in Russian shows a very high degree of regularity). The distinguishing

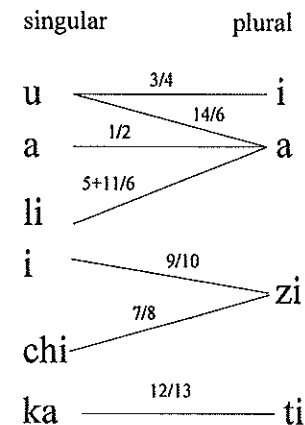
point is that it depends on a feature which is otherwise irrelevant to inflection and which cross-cuts the features which determine inflection. We can specify a domain *within* which it operates, but not a domain where it uniquely determined a syncretism.

6 Syncretism interacts with syntax

We have seen that the clear domains for syncretism are primarily morphological. Given that we find such domains, and that we do not find syntactic domains, this provides an additional argument for the autonomy of morphology. If the place of syncretism could be relegated to 'spelling out', our argument would be interesting but of limited weight. However, there are several well-known instances where syncretism licences syntactic constructions. This strengthens our conclusion considerably, since we see that syncretism is a phenomenon with syntactic effects, yet its domain is regularly determined within the morphology, to the exclusion of syntax.

We review briefly one such instance, namely agreement with conjoined noun phrases in Chichewa, a Bantu language of Malawi (for details see Corbett & Mtenje 1987, and Corbett 1991: 276-278). The gender system may be represented as in Figure 2.

Figure 2: The gender system of Chichewa



Chichewa has ten genders, which we refer to here by combining the traditional Bantu numbering for the agreements they take in the singular and plural. (We omit the three locative genders.) For conjoined noun phrases, Chichewa has resolution rules fairly typical for Bantu (cf. Givón 1970):

1. if all conjuncts denote humans, then the *a* form (gender 1/2 plural) will be used;
2. if none of the conjuncts denotes a human, then the *zi* form (gender 7/8 plural) will be used.

The operation of these rules can be seen in the following examples:

(11) ukonde ndi chipatso zi-ku-bvunda
14.net and 7.fruit 8-PRES-rot
'the net and the fruit are rotting'

(12) malalanje ndi zikuni zi-ku-bvunda
6.orange and 8.wood 8-PRES-rot
'the oranges and the pieces of wood are rotting'

(13) mpeni ndi mphika zi-ku-sowa
3.knife and 3.pot 8-PRES-miss
'the knife and the pot are missing'

Note particularly that though the nouns in (13) are glossed as individually requiring the same gender agreement (namely 3), this is not relevant for agreement when they are conjoined; instead the second resolution rule applies. Thus (11) - (13) follow the expected rules. Consider, however, this example:

(14) malalanje ndi masamba a-kubvunda
6.orange and 6.leaf 6-be.rotting
'the oranges and leaves are rotting'

Here we find two nouns of the same gender, both plural, and the verb takes the same plural form. This was found fully acceptable, though it is not the form which would be predicted by the rule given. Now consider plural nouns which are of different genders but whose subject agreement forms happen to coincide:

(15) amphaka ndi malalanje a-li uko
2.cat and 6.orange AG-be there
'the cats and the oranges are there'

The agreement marker (AG) on the verb is that corresponding to the plural both of gender 1/2 and of gender 5/6 (the form *zi-*, which would be predicted by the usual rules, may be an alternative). The regularity here is that if noun phrases are conjoined, headed by plural nouns whose target gender forms are syncretic, then

that target gender form will be the preferred form. There are different ways in which these examples might be analysed. The crucial point, however, is that the agreement form is determined, at least in part, by the fact that particular markers are syncretic. If the forms were not syncretic, then the regular rule would apply. For further discussion of syncretism in agreement morphology see Zwicky (1991), Gvozdanović (1991) and Carstairs-McCarthy (1992: 202-206).

7 Conclusion

The morphological domains of syncretism are well attested and varied. On the other hand, suggested syntactic and semantic domains of syncretism are at best problematic. These restrictions on the domains of syncretism constitute a further argument for the autonomy of morphology. As we see from data such as Chichewa conjoined noun phrases, the effects of autonomous morphology still have ramifications for syntax.

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