

# Types of Syncretism, and Their Effects\*

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## 1 Introduction

Across a number of languages and constructions, *feature conflicts* can be resolved by *syncretism*:

- (1) a. \*Either they or I are/am/is going to have to go.  
b. Either they or you are going to have to go.

Example (1) shows:

- feature conflict is not syntactically impossible ((1b))
- syncretism is required ((1b) vs. (1a))

- (2) **Question:** What kind of syncretism is good enough?

Two views:

- neutrality only (Zaenen and Karttunen (1984), Ingria (1990) and Dalrymple et al. (2009))
- neutrality or ambiguity (Pullum and Zwicky (1986))

**Neutrality:** The relevant features are treated in the same way by the morphological system (e.g. through underspecification).

**Ambiguity:** The relevant features are treated differently by the morphological system, and identity of outputs is accidental.

Ambiguous forms can be further split into two types:

**Morphological identity:** Morphemes are underlyingly the same.

**Phonological identity:** Only surface phonological forms are the same.

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The question in (2) has theoretical interest. The range of possibilities:

**No resolution:** Feature conflicts are syntactically prohibited.

**Resolution by neutrality only:** Feature conflicts are syntactically permitted. Analytical distinction (neutral vs. ambiguous) is empirically significant.

**Resolution by neutrality and morphological identity:** What is relevant is not the features involved, but only the corresponding morpheme.

**Resolution by neutrality and ambiguity (both types):** Resolution is a surface phenomenon.

To answer the question in (2), I conducted an *experiment* on Russian case syncretism, which exemplifies all three types discussed above.

**Pilot study results:** Only *neutrality* helps resolve feature conflicts.

Paper outline:

**Section 2:** Background on resolution by syncretism, and the neutrality vs. ambiguity debate.

**Section 3:** Detailed discussion of the Russian nominal declension system, focusing on the three types of syncretism – neutrality, morphological identity, and phonological identity

**Section 4:** Presentation of the experiment conducted and its results.

**Section 5:** Analysis of feature conflict resolution by neutral forms.

**Section 6:** Conclusion.

## 2 Background

In this section:

**Section 2.1:** The basics of resolution by syncretism (literature summary).

**Section 2.2:** Implications of the possibility of resolution by syncretism (feature conflicts are syntactically allowed).

**Section 2.3:** Summary of the debate as to what kind of syncretism (neutrality vs. ambiguity) resolves feature conflicts.

### 2.1 Resolution by syncretism

Consider the following German examples (from Pullum and Zwicky (1986), henceforth P&Z).

- (3) a. Sie findet Männer.  
she finds men-ACC  
'She finds men.'

- b. Sie hilft Männern.  
she helps men-DAT  
'She helps men.'
- (4) a. \*Sie findet und hilft Männer/Männern.  
she finds and helps men-ACC/men-DAT
- b. Sie findet und hilft Frauen.  
she finds and helps women-ACC/DAT  
'She finds and helps women.'

- The Right Node Raising (RNR) construction in (4a) is ungrammatical due to a feature conflict (acc vs. dat).
- Syncretism in (4b) *resolves* the feature conflict.

Resolution by syncretism had been noted for many constructions and languages:

#### Case conflicts:

**RNR:** German (P&Z), French and Icelandic (Zaenen and Karttunen (1984), henceforth Z&K)

**ATB movement:** Polish (Borsley (1983), Citko (2005))

**Free relatives:** German (Groos and Van Riemsdijk (1981)), Russian (Levy (2001) via Dalrymple et al. (2009))

**Gender conflicts:** German nouns (P&Z)

**Number conflicts:** German nouns (Z&K)

**Person conflicts:** English verbs (P&Z), German verbs (Eisenberg (1973), via P&Z)

**Noun class conflicts:** Xhosa adjectives (Voeltz (1971) via P&Z)

## 2.2 Implications for theories of grammar

Two challenges for any theory:

- (5) a. Ruling out examples like (6a), where conflicting case requirements make the sentence ungrammatical.
- b. Allowing examples like (6b), where syncretism makes it possible for conflicting case requirements to be satisfied.

Repeated from example (4):

- (6) a. \*Sie findet und hilft Männer/Männern.  
she finds and helps men-ACC/men-DAT
- b. Sie findet und hilft Frauen.  
she finds and helps women-ACC/DAT  
'She finds and helps women.'

What we learn:

- Case assignment (and feature assignment more generally) is not optional. ((6a) is ungrammatical)
- The syntax allows an item to bear contradictory features. ((6b) is grammatical)
- The morphological system is not “fail-safe,” but can rule out certain inputs. ((6a) is ungrammatical)

The last point is a problem for Distributed Morphology (DM) and any other system which always has defaults.

## 2.3 What kind of syncretism is relevant?

Types of syncretism:

**Neutral form:** Underspecified for a certain feature. Example: English past tense verbs (other than *be*) are neutral for person and number.

**Ambiguous form:** Not an underspecified representation. Two sets of features are accidentally represented in the same way. Example: English noun plural *-z* and English verb present tense 3rd person singular *-z*.

Claims in the literature:

**Resolution by neutrality only:** Z&K and Ingria (1990) (conflict must also be semantically irrelevant); DKS

**Resolution by neutrality and ambiguity:** P&Z (for ambiguous forms, feature must be “syntactically imposed”)

Experiment to determine what kind of resolution is possible:

- judgments collected systematically
- narrow domain: case syncretism in Russian RNR constructions
- range of syncretism types: neutrality, morphological identity, phonological identity
- detailed analysis of Russian declension system indicates syncretism type
- result: only *neutral* forms resolve feature conflicts

## 3 Types of syncretism, as seen in the Russian noun case system

We need *independent evidence* that distinguishes syncretism types in the Russian nominal declension system, in order to be able to analyze experimental results.

**Section 3.1:** Summary of Russian nominal declension paradigm.

**Section 3.2:** Wiese (2004) analysis of Russian declension system.

**Section 3.3:** Arguments to show that nominative-accusative syncretism is an instance of neutrality.

**Section 3.4:** Two types of ambiguity (morphological identity, phonological identity) and arguments supporting the analysis.

### 3.1 Russian noun declension summary

(7) Russian singular noun declension system:

case \ declension	Ia	Ib	II	III
Nominative	stol- $\emptyset$	oblak-o	lamp-a	kost'- $\emptyset$
Genitive	stol-a	oblak-a	lamp-y	kost-i
Dative	stol-u	oblak-u	lamp-e	kost-i
Accusative	stol- $\emptyset$ *	oblak-o	lamp-u	kost'- $\emptyset$
Instrumental	stol-om	oblak-om	lamp- <i>oj</i>	kost'- <i>ju</i>
Prepositional	stol-e	oblak-e	lamp-e	kost-i

*stol* – ‘table’; *oblako* – ‘cloud’; *lampa* – ‘lamp’; *kost'* – ‘bone’

\*The accusative is syncretic with the nominative for inanimates, and with the genitive for animates.

In addition, partitive case and locative case are largely syncretic with genitive and prepositional (respectively). Each is distinguished in a limited subset of singular class Ia nouns.

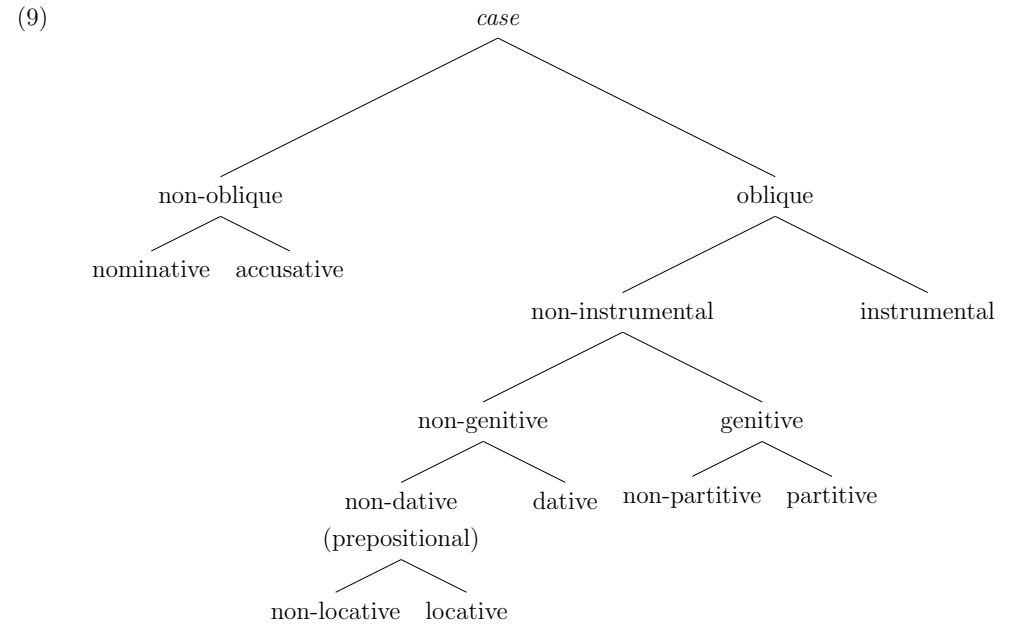
(8) Partitive and locative, class Ia:

Genitive	partitive	čaj- <b>u</b>	sok- <b>u</b>	les-a	grob-a
	non-partitive	čaj- <b>a</b>	sok- <b>a</b>	les-a	grob-a
Prepositional	locative	čaj-e	sok-e	les- <b>ú</b>	grob- <b>ú</b>
	non-locative	čaj-e	sok-e	les-e	grob-e

*čaj* – ‘tea’; *sok* – ‘juice’; *les* – ‘forest’; *grob* – ‘casket’

### 3.2 Analysis of Wiese (2004)

Wiese (2004) analyzes the Russian noun, adjective and demonstrative pronoun declension systems. Proposed feature hierarchy for Russian case:



- Affix insertion rules can refer to any feature in the above structure.
- An item bearing some case feature automatically bears all the features that dominate that case in the tree (e.g. nominative  $\rightarrow$  non-oblique).
- Specific morpheme insertion rules preempt less specific rules.

Class I forms are particularly relevant in the experiment conducted. Wiese (2004) analysis (note that class Ia nouns are masculine, class Ib nouns are neuter):

(10) Class I singular declension:

1. non-oblique, neuter  $\rightarrow$  -o  
dative  $\rightarrow$  -u  
partitive, non-neuter\*  $\rightarrow$  -u  
locative, non-neuter\*  $\rightarrow$  -ú
2. genitive  $\rightarrow$  -a  
non-genitive  $\rightarrow$  -e
3. oblique  $\rightarrow$  -om
4.  $\rightarrow$  - $\emptyset$

\*Applies to a lexically specified class of nouns.

The following features are used to insert each case morpheme.

(11) Class I singular declension:

	Neuter	Non-neuter
Nominative Accusative	non-oblique	<i>default</i>
Dative	dative	
Genitive	partitive non-partitive	partitive* genitive
Prepositional	locative non-locative	locative* non-genitive
Instrumental	oblique	

\*Applies to a lexically specified class of nouns.

The proposal seems somewhat arbitrary for class I nouns, but it attempts to capture syncretisms more broadly, including syncretism across declension classes.

(12) Rules for dative and prepositional, classes I and II:

1. dative, class I → -u
2. non-genitive → -e

(13) Dative and prepositional morphemes, classes I and II:<sup>1</sup>

	Class I	Class II
Dative	-u (dative)	
Prepositional	-e (non-genitive)	

Crucial aspects of the analysis of class I nouns (for our purposes):

- nominative and accusative suffixes are inserted by *the same* rule
- partitive and dative suffixes are inserted by *different* rules

### 3.3 Neutrality

Neutral forms are somehow *underspecified*. Proposals for Russian case system:

- underspecified feature structure (LFG analyses by Neidle (1988), DKS)
- one (underspecified) rule applies in two different environments based on shared features (DM-style analyses by Wiese (2004), Müller (2004))

According to all the authors above and the classic Jakobson (1958) analysis:

- Russian nominative-accusative syncretism is an instance of *neutrality*.

<sup>1</sup>We ignore the class I nouns with separate locative forms.

#### 3.3.1 Wiese (2004)

[nominative] and [accusative] are subtypes of [non-oblique]. The case morphology for [nominative] and [accusative] is inserted by a single rule (given here for singular class Ib nouns):

(14) non-oblique, neuter → -o

#### 3.3.2 Dalrymple et al. (2009)

Each noun encodes which cases a given form *cannot* represent (shown as “-”). Nouns that are syncretic for nominative and accusative have a neutral feature structure:

(15) 
$$\left[ \begin{array}{l} \text{NOMINATIVE} \\ \text{ACCUSATIVE} \\ \text{GENITIVE} \quad - \\ \text{DATIVE} \quad - \\ \text{INSTRUMENTAL} \quad - \\ \text{PREPOSITIONAL} \quad - \end{array} \right]$$

#### 3.3.3 Jakobson (1958) and Neidle (1988)

Nominative, accusative, etc. are not features, but are names for sets of feature specifications. Semantic-based case feature decomposition of Jakobson (1958):

**Marginal:** prepositional, dative, instrumental

**Quantifying:** genitive, prepositional

**Ascriptive:** accusative, dative, non-partitive genitive, non-locative prepositional

Semantic-based case feature decomposition of Neidle (1988):

**Locational:** prepositional, instrumental

**Quantifying:** genitive, prepositional, dative

**Directional:** accusative, genitive

**Partial:** partitive, locative

In the two systems:

**Nominative:** No features (default).

**Accusative:** One feature (ascriptive/directional).

Neidle (1988) does not analyze the class I paradigm in particular, but suggests that the endings are underspecified for the feature that distinguishes nominative from accusative. So in class Ib:

(16) -o: [-locational, -quantifying]

### 3.3.4 Müller (2004)

Syntactic-based case feature decomposition of Müller (2004):

**Subject:** nominative, genitive, instrumental

**Governed:** accusative, genitive, dative

**Oblique:** dative, genitive, instrumental, prepositional

The relevant cases:

**Nominative:** [+subject, –governed, –oblique]

**Accusative:** [–subject, +governed, –oblique]

Essentially the same rule proposed as in Wiese (2004):

(17) –oblique, class Ib → -o

### 3.3.5 Reasons for neutrality analysis of nominative-accusative syncretism

Why has the literature converged on analyzing Russian nominative-accusative syncretism as neutrality?

- metasyncretism (Williams (1994))
- syntactic connection

Nominative-accusative syncretism is prevalent in the Russian declension system:

- all singular non-feminine inanimates (for nouns, adjectives, demonstratives)
- plurals (for nouns, adjectives, demonstratives)
- class III (feminine) nouns

This motivates treating nominative and accusative as forming a category:

- If nominative and accusative *share* a feature (or features), each instance of syncretism is systematic.
- If nominative and accusative *do not share* a feature (or features), each instance of syncretism is accidental(!).

It has been argued that metasyncretism is actually best accounted for by rules of *impoverishment* – syntactic deletion of features. (Bobaljik (2001), Harley (2008)) For instance:

(18) [non-oblique, {nominative, accusative}] → [non-oblique]

However, some instances of resolution by syncretism do not have a motivated impoverishment analysis. Repeated from (1b):

(19) Either they or you are going to have to go.

(20) Agreement paradigm for English present tense *be*:

	singular	plural
1st	am	are
2nd	are	are
3rd	is	are

Natural analysis:

- *are* is a default form
- no impoverishment

An account of resolution without impoverishment is required regardless of the particular analysis of Russian nominative/accusative syncretism, so we set aside the impoverishment approach.

Grouping nominative with accusative in Russian is also syntactically motivated:

- structural cases
- behavior with numerals (Russian)
- behavior with genitive of negation (Russian)

Paucal numerals combine with:

- genitive singular nouns in nominative and accusative environments
- plural nouns with the appropriate case marking in all oblique environments

(21) dva stol-a  
two-NOM/ACC table-GEN.SG

(22) a. dvux stol-ov  
two-GEN table-GEN.PL  
b. dvum stol-am  
two-DAT table-DAT.PL  
c. dvunja stol-ami  
two-INST table-INST.PL  
d. dvux stol-ax  
two-PREP table-PREP.PL

Genitive of negation is licensed only for noun phrases that would otherwise be assigned nominative (in an unaccusative construction) or accusative. (Babby (1980), Pesetsky (1982))

- (23) a. Pis'ma ne prishli.  
letters-**NOM** not came-pl  
'The letters haven't come.'
- b. Pisem ne prishlo.  
letters-**GEN** not came-neut  
'Letters haven't come.'
- (24) Ja ne chital pis'ma/pisem.  
I not read letters-**ACC**/letters-**GEN**  
'I haven't read (the) letters.'
- (25) a. Ja ne rad pis'mam/\*pisem.  
I not glad letters-**DAT**/\*letters-**GEN**  
'I'm not glad of (the) letters.'
- b. Ja ne dovolen pis'mami/\*pisem.  
I not pleased letters-**INST**/\*letters-**GEN**  
'I'm not pleased with (the) letters.'
- c. Ja ne dumaju o pis'max/\*pisem.  
I not think about letters-**PREP**/\*letters-**GEN**  
'I don't think about (the) letters.'

Syntactic facts motivate the “non-oblique” (nominative + accusative) category. Economy motivates the neutrality analysis (one rule, (26a)), as opposed to the ambiguity analysis (two rules, (26b)).

- (26) Class Ib:
- a. non-oblique → -o
- b. nominative → -o  
accusative → -o

Metasyncretism and syntactic facts provide arguments for treating Russian nominative-accusative syncretism as an instance of neutrality, as a number of authors have done.

### 3.4 Ambiguity

Ambiguous forms:

- no neutral, underspecified representation in the lexicon
- syncretism is accidental

#### 3.4.1 Morphological identity

Morphological identity:

- morphemes are underlyingly identical

- *not* neutrality

Demonstrated in this section:

- Syncretism between dative and partitive suffixes for class Ia nouns (both *-u*) is an instance of morphological identity.

The literature supports the claim above.

**Wiese (2004)**

(27) **Rules for dative and partitive:**

- dative → -u
- partitive, non-neuter → -u

**Jakobson (1958) and Neidle (1988)** Feature decompositions:

**Jakobson (1958):** Partitive and dative share no features.

**Neidle (1988):** The only feature in common between partitive and dative is [−locational].

**Both proposals:** Partitive and dative share no features to the exclusion of genitive.

**Non-partitive genitive class Ia ending:** -a

**Partitive and dative class Ia ending:** -u

In these two systems, partitive-dative syncretism cannot be analyzed as neutrality without incorrectly assigning *-u* to non-partitive genitives.

**Reasons for ambiguity analysis of partitive-dative syncretism** Partitive and dative *-u* appear on different sets on nouns:

**Partitive -u:** subset of class Ia nouns

**Dative -u:** all class Ia and class Ib nouns.

If a single rule inserts both partitive and dative, there is no way to specify where this rule applies. In addition, partitive is closely connected to non-partitive genitive, and not to dative:

- Partitives are syncretic with non-partitive genitives in all parts of the declension system other than a subset of singular class Ia nouns (metasyncretism).
- Genitive case marking is permitted wherever partitive is possible ((28)).

- (28) Nalej mne sok-u/sok-a.  
pour me juice-PART/ juice-GEN  
'Pour me some juice.'

Partitive-dative syncretism is thus an instance of *morphological identity*, and has been treated this way in the literature.

### 3.4.2 Phonological identity

Phonological identity:

- different underlying forms
- same surface form

The following case syncretisms in class Ib nouns with unstressed endings are demonstrated to be instances of phonological identity:

- nominative/accusative-genitive-prepositional syncretism

#### (29) Class Ib declension, stressed and unstressed:

case	stressed	unstressed (spelling)	unstressed (phonology)
nominative	sedló ('saddle')	póle ('field')	póli ('field')
genitive	sedlá	pólja	póli
dative	sedlí	pólju	pólju
accusative	sedló	póle	póli
instrumental	sedlóm	pólem	pólim
prepositional	sedlé	póle	póli

Unstressed vowels preceded by a palatalized consonant neutralize:

- i, e, a, o → i
- u → u

The stressed endings faithfully reflect the underlying form.

#### (30) Class Ib declension, underlying and unstressed:

case	underlying	unstressed
nominative	-o	-i
genitive	-a	-i
dative	-u	-u
accusative	-o	-i
instrumental	-om	-im
prepositional	-e	-i

Nominative/accusative-genitive-prepositional syncretism is *phonological identity*:

- Underlying forms are *different*.
- Surface forms are *the same*.

There is a further possible distinction between nominative/accusative-prepositional syncretism and nominative/accusative-genitive syncretism. Padgett and Tabain (2005) show that the extent of vowel reduction in unstressed contexts varies. Vowels most likely to collapse:

- i and e
- o and e

**More likely to collapse:** nominative/accusative (-/o/) and prepositional (-/e/)

**Less likely to collapse:** nominative/accusative (-/o/) and genitive (-/a/)

### 3.5 Summary

Types of syncretism in the Russian case system, the effects of which are addressed in the experiment discussed below:

**Neutrality:** Featural underspecification.

**Ambiguity:** No (relevant) featural underspecification.

**Morphological identity:** Same morphological form, different features.

**Phonological identity:** Same phonological form, different morphology.

## 4 Experiment

**Goal:** Determining the ability of different types of syncretism to resolve feature conflicts.

**Paradigm:** Syncretism in the Russian case system: neutrality, morphological identity, and phonological identity.

**Outcome:** Neutrality resolves feature conflicts, but ambiguity does not.

In this section:

**Section 4.1:** Stimuli used.

**Section 4.2:** Overall setup.

**Section 4.3:** Participants of the experiment (conducted online), and the problem of identifying valid responses.

**Section 4.4:** Results.

### 4.1 Stimuli

The effects of the three types of syncretism discussed above (neutrality, morphological identity, phonological identity) were tested using Russian RNR constructions. In the examples used, the raised noun phrase was assigned one case in the first clause, and a different case in the second clause.

- (31) On ne ostavil tarelku/bljudce.  
he not kept plate-ACC/saucer-ACC  
'He didn't keep the plate/saucer.'
- (32) Emu nadoel-a/o tarelka/bljudce.  
him sick.of-fem/neut plate-NOM/saucer-NOM  
'He's sick of the place/saucer.'
- (33) On ne ostavil, a naoborot emu nadoel-o, bljudce s krasnoj  
he not kept, but opposite him sick.of-neut, saucer-ACC/NOM with red  
kaëmkoj.  
border  
'He didn't keep, but rather was sick of, the saucer with a red border.'

For each experimental condition (neutrality, ambiguity, two kinds of phonological identity), two types of sentences were presented.

**Test sentences:** RNRed noun is syncretic for the cases assigned by the two clauses.

**Control sentences:** RNRed noun is not syncretic for the cases assigned by the two clauses.

It bears the case assigned to it in the second clause.<sup>2</sup>

**Predicted:** Test sentences are more acceptable than the corresponding controls if, and only if, the type of syncretism involved (neutrality, morphological identity, phonological identity) can resolve feature conflicts.

Control sentences:

- minimally different from test sentences
- same case environment as test sentences
- RNRed noun is either in a different declension than in test sentences or has a stressed ending (vs. unstressed ending for test)

Examples of all types of sentences used are given below.

**Neutrality** Test sentences for the neutral condition used class Ib nouns and nominative/accusative case. Control sentences used class II nouns.

*Neutral:*

- (34) On ne ostavil, a naoborot emu nadoel-o, bljudce s  
he not kept, but opposite him sick.of-neut, saucer[Ib]-ACC/NOM with  
krasnoj kaëmkoj.  
red border  
'He didn't keep, but rather was sick of, the saucer with a red border.'

<sup>2</sup>Sentences where the RNRed noun bears the case assigned by the first clause instead are markedly worse (according to my own judgments and those of two other informants).

*Case assignment conflict with second conjunct agreement:*

- (35) On ne ostavil, a naoborot emu nadoel-a, tarelka s chërnoj  
he not kept, but opposite him sick.of-fem, plate[II]-NOM with black  
kaëmkoj.  
border  
'He didn't keep, but rather was sick of, the plate with a black border.'

**Morphological identity** Test sentences for the morphological identity condition used class Ia nouns and partitive/dative case. Control sentences used class Ib nouns.

*Morphologically identical:*

- (36) On ne sosedu otlil, a naoborot poradovalsja, chaju  
he not neighbor-dat poured, but opposite was.glad, tea[Ia]-PART/DAT  
so sgushchënym molokom.  
with condensed milk  
'He didn't pour some to his neighbor, but rather was glad of, tea with condensed milk.'

*Case assignment conflict with second conjunct agreement:*

- (37) On ne sosedu otlil, a naoborot poradovalsja, moloku s  
he not neighbor-dat poured, but opposite was.glad, milk[Ib]-DAT with  
saxarom i likërom.  
sugar and liqueur  
'He didn't pour some to his neighbor, but rather was glad of, milk with sugar and liqueur.'

**Phonological identity** Test sentences for the phonological identity condition used class Ib nouns with unstressed endings (with several pairs of cases). Control sentences used class Ib nouns with stressed endings.

*Phonologically identical:*

- (38) On ne nastupil, a sidel, na lózhe s serym pokryvalom.  
He not stepped, but sat, on bed[Ib]-ACC/PREP with gray bedspread  
'He did not step on, but sat on, the bed with a gray bedspread.'

*Case assignment conflict with second conjunct agreement:*

- (39) On ne nastupil, a sidel, na vedré s bol'shoj dyrkoj.  
 He not stepped, but sat, on bucket[**Ib**]-**PREP** with big hole  
 'He did not step on, but sat on, the bucket with a big hole.'

Also used in the experiment:

- RNR examples where the same case is assigned in both clauses, as a baseline for the acceptability of RNR.
- Fillers:
  - of comparable length with the RNR sentences, but not containing RNR
  - half grammatical, half with incorrect case marking
  - helped assess whether each participant successfully distinguished good sentences from bad ones

**RNR without case conflict:**

- (40) On ne soxranil, a naoborot vybrosil, pechen'e iz poezdki v Angliju.  
 he not kept, but opposite discarded, cookie-**ACC** from trip to England  
 'He did not keep, but rather threw out, cookies from a trip to England.'

**Fillers:**

- (41) On vchera vybrosil, ponimaja, chto postupaet glupo, tarelku iz  
 he yesterday discarded, realizing, that acts stupidly, plate-**ACC** from  
 tonkogo fajansa.  
 thin faience  
 'He threw away yesterday, realizing that he's acting stupidly, a fine faience plate.'
- (42) \*On vchera vybrosil, ponimaja, chto postupaet glupo, tarelka iz  
 he yesterday discarded, realizing, that acts stupidly, plate-**NOM** from  
 tonkogo fajansa.  
 thin faience

Summary of Russian sentences evaluated:

**Test sentences:** Right Node Raising (RNR) sentences with case feature conflict requiring resolution by:

1. neutrality
2. morphological identity
3. phonological identity (two sets of underlying forms used)

**Negative controls:** RNR sentences with the RNRed noun bearing case marking consistent only with the second conjunct (closest conjunct agreement); these were constructed to form minimal pairs with the test sentences.

**Positive controls:** RNR sentences with no feature conflict, used to determine acceptability of RNR

**Fillers:** sentences involving case assignment over an intervening adjunct, both with correct and with incorrect case forms

## 4.2 Experimental set-up

Sentences were presented in audio form in order to counteract the effects of spelling on speaker judgments.

**Question asked:** "Can you say this?" (presented in Russian)

**Possible responses:** "yes" or "no"

Each speaker judged up to five sets of sixteen sentences. Each set included:

- one test sentence of each type (resolution by neutrality, morphological identity, and two types of phonological identity)
- one negative control for each type of test sentence (closest conjunct agreement)
- two positive controls (RNR sentences with no feature conflict)
- six filler sentences

## 4.3 Participants

The experiment was presented through Amazon Mechanical Turk.<sup>3</sup> Participants included:

- random internet users
- Russian-speaking acquaintances

**Problem:** identifying Russian speakers online

**Solution:** answers to free-response questions

Four free-response questions were asked (all presented in Russian):

- year of birth
- place of birth
- place of residence
- comments (optional)

Several types of responses indicated that a participant does not speak Russian:

- responses inappropriate to question (e.g. a first name given for place of birth, a full date or an age given for year of birth)
- ungrammatical responses

<sup>3</sup>One speaker was instead given the recorded sentences directly.

- locations outside of the former USSR (usually in India) given for both place of birth and place of residence

Only results from those who were judged with a high degree of confidence to be speakers of Russian are included below.

**Further problem:** Russian speakers are not guaranteed to pay attention/do the task.

**Solution:** Speakers were categorized based on performance on the filler sentences. (One participant's results were discarded because the experiment was completed impossibly quickly.)

#### 4.4 Results and discussion

Key result:

- Neutrality helps resolve feature conflicts.
- Ambiguity (including both morphological identity and phonological identity) does not help resolve feature conflicts.

Responses:

- 24 Russian speakers
- 91 total responses for each condition
- binary acceptance/rejection responses

#### (43) Results for all speakers:

Condition	# accepted	# total	% accepted
Fillers (grammatical)	231	273	85%
Fillers (ungrammatical)	127	274	46%
RNR, no case conflict	129	182	71%
Neutrality	54	91	59%
Neutrality controls	47	91	52%
Morphological identity	40	91	44%
Morphological identity controls	37	90	41%
Phonological identity (acc-prep)	51	91	56%
Phonological identity (acc-prep) controls	54	91	59%
Phonological identity (nom/acc-gen)	38	91	42%
Phonological identity (nom/acc-gen) controls	45	91	49%

All conditions were accepted a high portion of the time (41% to 85%). Even the ungrammatical fillers had a 46% acceptance rate. This suggests:

- The task was difficult.

- Some participants did not pay attention or did not actually execute the task.

The data is clearer for speakers who successfully distinguished grammatical filler sentences from ungrammatical ones. Results on fillers by speaker are given below. The final column gives the probability that the speaker does not prefer grammatical fillers over ungrammatical fillers ones, calculated using Fisher's Exact Test.

#### (44) Filler results by speaker:

Grammatical fillers (accepted/total)	Ungrammatical fillers (accepted/total)	p
11/12	4/11	p<.01
11/15	2/15	p<.01
14/15	2/15	p<.01
13/15	2/15	p<.01
14/15	3/15	p<.01
13/15	4/15	p<.01
13/15	3/15	p<.01
13/15	6/15	p=.01
8/9	3/10	p=.01
4/6	0/7	p=.02
14/15	10/15	p=.08
2/3	0/3	p=.10
13/15	9/15	p=.11
3/3	1/3	p=.20
15/15	13/15	p=.24
13/15	11/15	p=.33
14/15	13/15	p=.5
11/15	10/15	p=.50
14/15	13/15	p=.50
3/3	2/3	p=.50
3/3	2/3	p=.50
11/12	10/11	p=.74
1/3	2/4	p=.86
0/3	2/3	p=1.0

Two obvious splits:

- p<.12 ("good" speakers)
- p<.03 ("excellent" speakers)

There are no crucial differences between data from good speakers and data from excellent speakers.

(45) **Results for good speakers:**

Condition	# accepted	# total	% accepted
Fillers (grammatical)	143	165	87%
Fillers (ungrammatical)	48	164	29%
RNR, no case conflict	84	110	76%
Neutrality	39	55	71%
Neutrality controls	28	55	51%
Morphological identity	32	55	58%
Morphological identity controls	32	54	59%
Phonological identity (acc-prep)	35	55	64%
Phonological identity (acc-prep) controls	34	55	62%
Phonological identity (nom/acc-gen)	30	55	55%
Phonological identity (nom/acc-gen) controls	36	55	65%

(46) **Results for excellent speakers:**

Condition	# accepted	# total	% accepted
Fillers (grammatical)	114	129	88%
Fillers (ungrammatical)	29	127	23%
RNR, no case conflict	67	86	78%
Neutrality	30	43	70%
Neutrality controls	21	43	49%
Morphological identity	24	43	56%
Morphological identity controls	23	42	55%
Phonological identity (acc-prep)	24	43	56%
Phonological identity (acc-prep) controls	25	43	58%
Phonological identity (nom/acc-gen)	24	43	56%
Phonological identity (nom/acc-gen) controls	29	43	67%

- The three sets of speakers accepted grammatical fillers at approximately the same rate.
- The better speakers were more likely to reject the ungrammatical fillers.

(47) **Acceptance rates for baseline conditions:**

Condition	Speaker type		
	All	Good	Excellent
Fillers (grammatical)	85%	87%	88%
Fillers (ungrammatical)	46%	29%	23%
RNR, no case conflict	71%	76%	78%

The entire range of acceptability increases from 41-85% to 29-87% and 23-88% as we narrow down the sets of speakers.

RNR sentences with no case conflict:

- higher acceptance rate than all types of RNR examples with case conflict (all groups)
- lower acceptance rate than grammatical fillers ( $p < .01$  for all speakers,  $p = .02$  for good speakers,  $p = .03$  for excellent speakers)

There is a big difference between all speakers and good/excellent speakers in the neutrality condition.

(48) **Results for neutrality condition:**

Speakers	Condition	# accepted	# total	% accepted	p
all	neutrality	54	91	59%	$p = .19$
	controls	47	91	52%	
good	neutrality	39	55	71%	$p = .03$
	controls	28	55	51%	
excellent	neutrality	30	43	70%	$p = .04$
	controls	21	43	49%	

**All speakers:** no statistically significant difference between the neutrality condition and the corresponding controls

**Good and excellent speakers:** *neutrality sentences more acceptable than corresponding controls* ( $p < .05$ )

There is no significant difference between the test sentences and the control sentences in any of the other conditions, for any of the three sets of speakers ( $p > .15$ ).

Comparing results from different experimental conditions:

- not obviously useful (examples are not minimal pairs)
- acceptance rates (both for test and control sentences) for the three ambiguity conditions are all in the same ballpark (41% to 59% for all speakers, 55% to 65% for good speakers, 55% to 67% for excellent speakers)

## 5 Theoretical implications and analysis

The experimental results indicate that neutrality is different from ambiguity in an empirically and theoretically significant way.

**Syntax:** feature conflicts permitted

**Morphology:** certain types of feature conflicts prohibited

In particular, the assignment to an item of two features that are spelled out by different rules (i.e. no neutrality) must be banned in certain circumstances.

In this section:

**Section 5.1:** A system with underspecification and defaults, such as DM, will never fail to find a form to match any set of features. This is problematic for explaining the syncretism data.

**Section 5.2:** An analysis of the experimental data based on:

- an elaborated version of DM
- multidominance
- feature structures

**Section 5.3:** Summary of key theoretical implications.

**Section 5.4:** Presentation of the system proposed by DKS, which assumes that lexical items are part of the sentence structure and not inserted post-syntactically.

### 5.1 Distributed Morphology as-is

Key properties of DM:

- disjunctively ordered rules of insertion
- underspecification

In such a system [partitive, dative] (for instance) could be spelled out by one of four types of rules:

- (49)
1. partitive, dative → a
  2. partitive → b
  3. dative → c
  4. → d

Presumably there is no rule like 1 in the morphological system. But [partitive, dative] can be spelled out by rule 2, 3, or 4.

**Problem:** It is never impossible to spell out an item based on its having too many features. How can non-syncretic and ambiguous forms be ruled where neutral forms are possible?

## 5.2 Modifying Distributed Morphology

### 5.2.1 What we want

How can a morphological system like DM rule out forms with conflicting features? Proposal:

1. In examples of resolution by syncretism, an item (e.g. RNRed noun) receives two separate sets of features (or feature structures).
2. The derivation crashes if the two sets of features are not spelled out by the same rule.

What exactly causes an item to bear two sets of features is discussed in the next section.

Example (50) presents examples of RNR in Russian, with different cases assigned in the two conjuncts.

(50a): non-syncretic form

(50b): ambiguous form

**Partitive and dative:**

- (50) a. ?\*On ne so<sup>s</sup>edu o<sup>t</sup>lil, a naoborot poradovalsja, moloku s  
 he not neighbor-dat poured, but opposite was.glad, milk[Ib]-DAT with  
 saxarom i likërom.  
 sugar and liqueur  
 ‘He didn’t pour some to his neighbor, but rather was glad of milk with sugar and liqueur.’
- b. ?\*On ne so<sup>s</sup>edu o<sup>t</sup>lil, a naoborot poradovalsja,  
 he not neighbor-dat poured, but opposite was.glad,  
 cha<sup>j</sup>ju so sgushchënym molokom.  
 tea[Ia]-PART/DAT with condensed milk  
 ‘He didn’t pour some to his neighbor, but rather was glad of tea with condensed milk.’

Suppose that in the examples in (50):

- the two case features assigned to the RNRed noun are not spelled out together, but rather become part of *two separate sets of features*
- the two feature sets must be spelled out by a single rule

**moloko** (‘milk’): [partitive, singular, class Ib] and [dative, singular, class Ib]

**chaj** (‘tea’): [partitive, singular, class Ia] and [dative, singular, class Ia]

For *moloko* (‘milk’), the following two insertion rules would spell out the two feature sets:

- partitive, singular, class Ib → -a
- dative, singular, class Ib → -u

Result:

- two different rules, two different morphemes → rejected

Rules for the two sets of features on *čaj* ('tea'):

- partitive, singular, class Ia → -u
- dative, singular, class Ia → -u

Result:

- two different rules, same morphemes → rejected

Using two different insertion rules for the two sets of features makes the result ungrammatical. This contrasts with examples like (51) and (52) where the same insertion rule applies to the two sets of features.

(51): identity

(52): neutrality

**Accusative and accusative:**

(51) On ne soxranil, a naoborot vybrosil, pechen'e iz poezdki v  
 he not kept, but opposite discarded, cookie-ACC/ACC from trip to  
 Angliju.  
 England  
 'He did not keep, but rather threw out, cookies from a trip to England.'

**Accusative and nominative:**

(52) On ne ostavil, a naoborot emu nadoel-o, bljudce s  
 he not kept, but opposite him sick.of-neut, saucer[Ib]-ACC/NOM with  
 krasnoj kaómkoj.  
 red border  
 'He didn't keep, but rather was sick of, the saucer with a red border.'

*pechen'e* ('cookie'): [accusative, singular, class Ib] and [accusative, singular, class Ib]

*bljudce* ('saucer'): [accusative, singular, class Ib] and [nominative, singular, class Ib]

Nominative-accusative syncretism is an instance of neutrality. The feature sets on *pechen'e* ('cookie') and *bljudce* ('saucer') are spelled out by a single rule:

- non-oblique, singular, class Ib → -o

Result:

- single rule → accepted

Summary:

1. In certain situations, an item bears more than one feature set.
2. If an item bears two feature sets, both sets must be spelled out by the same morphological insertion rule.

So in Russian RNR constructions:

identity, neutrality → accepted

ambiguity, no syncretism → rejected

### 5.2.2 How to get it

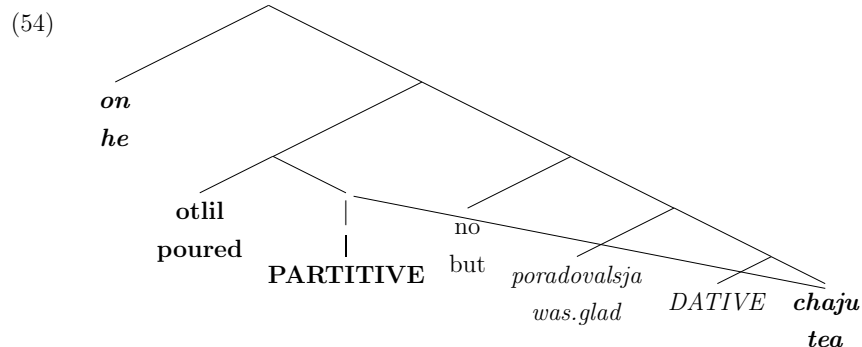
When does an item bear more than one set of features? I propose:

1. Multiple features of the same type can be assigned in a multidominant structure. For example, an RNRed noun, shared in a multidominant structure, receives multiple case features.
2. Multiple feature structures are generated when an item is assigned two features for the same feature category. For example, a noun assigned case twice will have associated with it two feature structures that must be spelled out.

**Multidominance** Morphological identity example (simplified):

(53) \*On otlil, no poradovalsja, čajju.  
 he poured, but was.glad, tea[Ia]-PART/DAT  
 'He poured off, but was glad of, the tea.'

A multidominant structure has been proposed for RNR constructions (McCawley (1982), Wilder (1999)):



There are two clauses with overlapping members, joined together by *no* ('but').

**In bold:** partitive assigned to *čaj* ('tea')

**In italics:** dative assigned to *čaj*

Syntactically separate case (shown above) is not strictly essential, but it makes the proposal simpler.

- A noun is assigned case features by the case nodes it combines with.

- When a noun combines with more than one case node (e.g. PARTITIVE and DATIVE above), it receives a case feature from each case node.

Multidominance has been proposed for most of the constructions where syncretism effects have been observed:

- RNR (McCawley (1982), Wilder (1999))
- ATB movement (Citko (2005))
- free relatives (Riemsdijk (2000))

**Feature structures** What happens when an item receives more than one case feature? My account is inspired by the proposal of Bjorkman (2009):

- When an item is assigned two features from the same feature hierarchy, a split into two separate feature structures occurs.
- Example: [dative] and [partitive] are both in the feature hierarchy for case. If both are assigned to a single noun, that noun ends up bearing two separate feature structures.

I propose that every lexical item is associated with a feature matrix. For Russian nouns, it contains:

- number
- declension class
- case

To illustrate (repeated from (53)):

- (55) \*On otlil, no poradovalsja, chaju.  
 he poured, but was.glad, tea[Ia]-PART/DAT  
 ‘He poured off, but was glad of, the tea.’

*Chaju* (‘tea’) is inherently class Ib and singular:

$$(56) \begin{bmatrix} \text{CLASS} & \text{Ib} \\ \text{NUMBER} & \text{singular} \end{bmatrix}$$

*Chaju* is also assigned case by *otlil* (‘poured’) and *poradovalsja* (‘was glad’). *Otlil* assigns partitive case, which creates the following structure:

$$(57) \begin{bmatrix} \text{CLASS} & \text{Ib} \\ \text{NUMBER} & \text{singular} \\ \text{CASE} & \text{partitive} \end{bmatrix}$$

Now, when *poradovalsja* assigns dative case, it cannot be inserted in the matrix above, as the CASE slot is already filled. Proposal:

- a new feature matrix is created
- all non-conflicting values (in this instance, class and number) are preserved
- there is a new case value

*Chaju* thus bears both of the feature matrices in (58):

$$(58) \begin{bmatrix} \text{CLASS} & \text{Ib} \\ \text{NUMBER} & \text{singular} \\ \text{CASE} & \text{partitive} \end{bmatrix} \quad \begin{bmatrix} \text{CLASS} & \text{Ib} \\ \text{NUMBER} & \text{singular} \\ \text{CASE} & \text{dative} \end{bmatrix}$$

All the feature structures an item bears must be spelled out. As proposed above:

- The derivation crashes when two different rules are used to do spell out the feature sets on a single item (as in the partitive/dative example).
- Two feature structures on a single item do not result in a crash so long a they are spelled out by a single rule (as in examples of nominative/accusative syncretism).

### 5.3 Summary

I have argued that:

- Feature conflicts are permitted by the syntax (for neutral forms).
- Feature conflicts are resolved when the morphology treats the features assigned in the same way.
- Feature conflicts are not resolved by accidentally syncretic forms.

The fate of an item with conflicting feature specifications is determined at the intermediate level of morphological spellout, which is where neutral and ambiguous forms are distinguished.

### 5.4 System without post-syntactic vocabulary insertion (Dalrymple et al. (2009))

For DKS, lexical items are part of the syntactic structure, which allows for a somewhat different approach to resolution by neutrality.

The case feature of a noun is a structure indicating which values that noun does not have (marked by “–”). For example, a noun that is neutral for nominative/accusative, but is distinct from the partitive and dative forms, has the following feature structure:<sup>4</sup>

<sup>4</sup>For simplicity, only four cases are shown.

$$(59) \begin{bmatrix} \text{NOM} \\ \text{ACC} \\ \text{PART} & - \\ \text{DAT} & - \end{bmatrix}$$

Ambiguous forms are not underspecified. A noun that is ambiguous (and not neutral) between partitive and dative has of the following two case feature structures:

$$(60) \text{ a. } \begin{bmatrix} \text{NOM} & - \\ \text{ACC} & - \\ \text{PART} \\ \text{DAT} & - \end{bmatrix} \quad \text{b. } \begin{bmatrix} \text{NOM} & - \\ \text{ACC} & - \\ \text{PART} & - \\ \text{DAT} \end{bmatrix}$$

In a sentence, a verb specifies what case its object (and subject) must take (marked by “+”). For example, a noun neutral for nominative/accusative (as in (59)) in an accusative environment has the following feature structure:

$$(61) \begin{bmatrix} \text{NOM} \\ \text{ACC} & + \\ \text{PART} & - \\ \text{DAT} & - \end{bmatrix}$$

An unambiguously nominative noun cannot be used in an accusative environment, as indicated by the occurrence of “+” and “-” in the same cell:

$$(62) \begin{bmatrix} * \text{NOM} \\ \text{ACC} & +/- \\ \text{PART} & - \\ \text{DAT} & - \end{bmatrix}$$

In an environment where two cases are assigned to the same noun (e.g. RNR):

- The functional structure for the noun is shared between the two clauses.
- A single case feature structure receives case specifications from both clauses.

Consequently, when there is no form that is neutral for the cases assigned, the result is ungrammatical. Example without neutrality:

$$(63) \text{ *On otlil, no poradovalsja, chaju.} \\ \text{he poured, but was glad, tea[la]-PART/DAT} \\ \text{'He poured off, but was glad of, the tea.'}$$

Structures to consider (both ruled out):

$$(64) \text{ a. } \begin{bmatrix} * \text{PRED 'otlil'} \\ \text{OBJ} \begin{bmatrix} \text{PRED 'chaju'} \\ \text{CASE} \begin{bmatrix} \text{NOM} & - \\ \text{ACC} & - \\ \text{PART} & + \\ \text{DAT} & +/- \end{bmatrix} \end{bmatrix} \end{bmatrix} \\ \text{PRED 'poradovalsja'} \\ \text{OBJ} \end{bmatrix} \\ \text{b. } \begin{bmatrix} * \text{PRED 'otlil'} \\ \text{OBJ} \begin{bmatrix} \text{PRED 'chaju'} \\ \text{CASE} \begin{bmatrix} \text{NOM} & - \\ \text{ACC} & - \\ \text{PART} & +/- \\ \text{DAT} & + \end{bmatrix} \end{bmatrix} \end{bmatrix} \\ \text{PRED 'poradovalsja'} \\ \text{OBJ} \end{bmatrix}$$

A neutral form can be assigned two different cases, for example nominative and accusative:

$$(65) \begin{bmatrix} \text{NOM} & + \\ \text{ACC} & + \\ \text{PART} & - \\ \text{DAT} & - \end{bmatrix}$$

- RNRed noun combines with both predicates at some level (similar to multidominance)
- syncretism effects incorporated in a natural way
- no late insertion

## 6 Conclusion

### 6.1 Further experiments

The results reported in this paper are preliminary, as they are based on a fairly small number of speakers. A follow-up experiment could use written, rather than recorded, stimuli.

- The task would be quicker, making it easier to scale up.
- Results for the version of phonological identity where different spellings are used for the two syncretic forms (nominative/accusative-genitive identity) may be invalidated, but this is not a crucial test case.

It would also be helpful to investigate the phenomenon of resolution by syncretism in other languages (and in other constructions) to see if the generalization that neutral forms resolve feature conflicts while ambiguous ones do not is carried over. In order to do this, we must find other domains where there is clear independent evidence as to whether there is neutrality or ambiguity between forms.

### 6.2 Summary

Resolution of feature conflicts by syncretic forms is well-established. This phenomenon is important for our theory of grammar and grammaticality judgments, as it indicates that:

1. **Syntax** allows feature conflicts (as otherwise syncretic forms would never make constructions with feature conflicts grammatical).
2. **Morphology** or phonology disallows certain feature conflicts (as otherwise non-syncretic forms would be equally grammatical).

**Debate:** What kinds of syncretism are able to resolve conflicts?

**Contribution:** The results of an experiment on case resolution in Russian RNR constructions show that neutral forms can resolve feature conflicts, but ambiguous forms cannot.

This result (if borne out) provides a novel way of empirically distinguishing ambiguity from neutrality. We also learn that it is the morphological system that determines whether, e.g., two case features can coexist on one item.

Proposed analysis:

1. Multiple features of the same type can be assigned in a multidominant structure. For example, an RNRed noun shared in a multidominant structure, receives multiple case features.
2. Multiple feature structures are generated when an item is assigned two features for the same feature category. For example, a noun assigned case twice will have associated with it two feature structures that must be spelled out.

3. The derivation crashes when it is not possible to spell out all the feature structures on an item with a single rule. For example, a Russian noun bearing both partitive and dative cannot be spelled out.

The morphological system thus determines whether a given feature conflict is permitted.

## A Russian plural declension system

case \ declension	Ia	Ib	II	III
Nominative	stol-y	oblak-a	lamp-y	kost-i
Genitive	stol-ov	oblak-ov	lamp-∅	kost-ej
Dative	stol-am	oblak-a	lamp-am	kost-jam
Accusative	stol-y*	oblak-a*	lamp-y*	kost-i*
Instrumental	stol-ami	oblak-ami	lamp-ami	kost-jami
Prepositional	stol-ax	oblak-ax	lamp-ax	kost-jax

\*The accusative is syncretic with the nominative for inanimates, and with the genitive for animates.

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