

Advances in formal Slavic linguistics 2016

Edited by

Denisa Lenertová

Roland Meyer

Radek Šimík

Luka Szucsich

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Chapter 1

Doubly filled COMP in Czech and Slovenian interrogatives

Julia Bacskai-Atkari

University of Potsdam

This article investigates the syntax of doubly filled COMP patterns in Czech and Slovenian interrogatives from a cross-linguistic perspective, concentrating on the differences between Germanic and Slavic doubly Filled COMP. In Germanic, dialects that allow the doubly filled COMP pattern do so to lexicalise a C head specified as [fin] with overt material, which is regularly carried out by verb movement in main clauses (e.g. V2 in German, T-to-C in English interrogatives) and by the interrogative complementiser in embedded polar questions. The insertion of the complementiser has no interpretive effect on the clause and is restricted to embedded clauses. By contrast, in Czech and Slovenian a complementiser can be inserted even in main clauses, and while its presence is optional, its insertion triggers an interpretive difference, resulting in an echo reading. I argue that while in Germanic, the C head is specified as [wh] and is checked off by the wh-element, in Slavic the C is not specified as [wh] and the type of the clause hence matches the properties of the inserted declarative head. In turn, the wh-element moves because it is focused: echo questions are closer to focus constructions than to ordinary questions.

Keywords: complementiser, doubly filled COMP, echo questions, finiteness, interrogative clause, wh-movement

1 Introduction

Doubly filled COMP patterns and especially their absence from the standard varieties are well known in the literature on West-Germanic languages.¹ In order

¹The West-Germanic languages to be discussed here include English, German, and Dutch. Note that there have been claims in the literature, notably by emondsfaarlund2014 that English is not a West-Germanic but a North-Germanic language. However, as shown convincingly by bechwalkden2016, this claim has serious problems and it cannot be maintained.

to illustrate the phenomenon, consider first the following interrogatives from Standard English:

- (1) a. Which book did she buy?
- b. Did she buy a book?
- c. I don't know which book (*that) she bought.
- d. I don't know if she bought a book.

The ban on the insertion of *that* in (1c) is traditionally referred to as the “doubly filled COMP filter”, which is supposed to prohibit lexical material in both the specifier and the head of the same XP projection (chomskylasnik1977, see also koopman2000). Hence, the wh-element *which book* cannot co-occur with the complementiser *that* in embedded constituent questions. The same issue does not arise in embedded polar questions containing *if*, since the interrogative marker is the complementiser in these cases: the impossibility of the sequence *if that* follows from the two elements being in complementary distribution and need not be accounted for by an additional filter rule.

One problem that arises with the doubly filled COMP filter as a general rule is that it is not obeyed in main clause constituent questions. As can be seen in (1a) and (1b), the verb moves up to C in main clause questions in English (and more generally in Germanic), and this results in the co-occurrence of an overt wh-element in SpecCP with the verb in C in main clause constituent questions, see (1a). While one could in principle argue that main clause questions with verb movement are subject to different requirements, another problem arises in connection with various non-standard dialects (as indicated by vangeldereren2009, bayer2004 and bayerbrandner2008, such dialects are found across West Germanic without a very clear geographical restriction), which show clear violations of the doubly filled COMP filter (cf. the data in baltin2010):

- (2) a. I don't know which book that she bought.

As can be seen, the co-occurrence of the wh-phrase and *that* is allowed in the non-standard pattern; this is attested across Germanic. This obviously raises the question why doubly filled COMP patterns arise in Germanic and, if applicable, cross-linguistically.

In this article, I propose the following. First, doubly filled COMP patterns in Germanic arise when a finite complementiser is inserted in addition to a wh-element in SpecCP and the complementiser serves to lexicalise [fin] in C. In principle, lexicalisation can be carried out by other elements, too (such as verbs in

main clauses), and the insertion of *that* causes no interpretive differences compared to *that*-less interrogatives. I argue that the lexicalisation requirement on [fin] is more generally attested in the syntactic paradigm and is related to V2 and to T-to-C movement. Second, there is no such lexicalisation requirement in Slavic languages and the insertion of a complementiser causes an interpretive difference (namely, the clause is interpreted as an echo). I argue that this difference is related to syntactic features as well: while wh-movement in Germanic doubly filled COMP structures is driven by a [wh] feature on the C head, there is no such feature on C in Slavic doubly filled COMP structures.

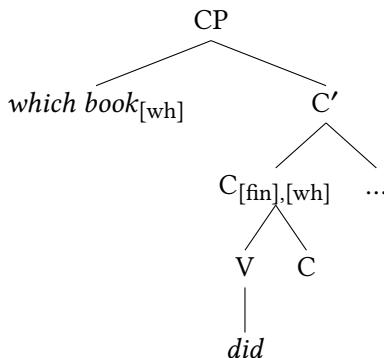
2 Doubly filled COMP in Germanic

I adopt the general idea of **bacskaiatkaritoappear**, according to which a C with [fin] specification is regularly lexicalised in Germanic, with some inter-language variation. English is somewhat exceptional as it is not a V2 language: the lexicalisation rule applies to interrogatives and is manifest in the phenomenon of T-to-C movement. In German, it applies to declaratives as well and results in the matrix V2 configurations. Consider the following matrix interrogatives in English:

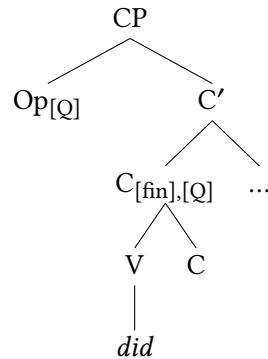
- (3) a. **Which book did she buy?**
 b. **Did she buy a book?**

The corresponding structures are shown in (4) below:

- (4) a.



- b.



In either case, the C head is lexicalised by way of the verb moving up to C via head adjunction, and the SpecCP position is filled by an operator element. Note that there is a distinction between [wh] and [Q], following the idea of **bayer2004**,

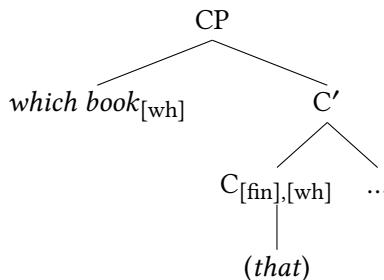
whereby [Q] essentially stands for disjunction; wh-elements are [Q] but not all elements with a [Q] specification are [wh] (see *bacskaiatkaritoappear* for [Q] in Germanic). Further, the operator in (4b) is a covert polar operator. The polar operator can in principle be overt (e.g. English *whether*) or covert, and it marks the scope of a covert *or* (larson1985). This operator is inserted directly into SpecCP (bianchicruschina2016).

Consider now the following English embedded interrogatives:

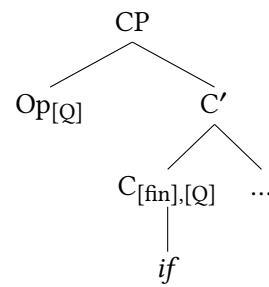
- (5) a. I don't know **which book** (% that) she bought.
 b. I don't know if she bought a book.

The corresponding structures are shown in (6):²

- (6) a.



- b.



The interrogative feature has to be marked overtly in embedded questions (there being no distinctive interrogative intonation) and it is done either by an overt complementiser or by an overt operator. Accordingly, the interrogative feature on C can be checked off by inserting an element into C (*if*) or by inserting an

²Contrary to *baltin2010*, I assume that doubly filled COMP structures are literally doubly filled COMP, that is, there is only a single CP involved; see *bacskaiatkari2018sardis* for arguments on this. Essentially, *baltin2010* assumes that the ban on overt material in C in sluiced clauses (*merchant2001*) follows directly from the fact that the ellipsis position is located in the highest C head, eliding the complementiser in a lower C position. However, this is in fact not a sound argument since the lack of a complementiser in these cases can be due to phonological factors as well (the complementiser cliticising onto the clause in the languages he examined), which may indeed be subject to cross-linguistic variation. In Slovenian, for instance, wh-slices can contain a complementiser (e.g. *da* 'that' but apparently also *če* 'if'), see *marusicmismasplesnicarrazborsekulsuligoj2015*, indicating that the generalisation does not hold. Note that the Slovenian data contradict the judgements given by *merchant2001*, who suggests that while doubly filled COMP patterns are possible in Slovenian in the same way they are attested in other languages (see, for instance, the Danish and Irish data given by *merchant2001*), the sluiced version of doubly filled COMP clauses (containing an overt complementiser) is uniformly rejected.

element into the specifier (*which book* in (6a) above). By contrast, [fin] can be lexicalised only by an element inserted into C (*that* and *if* in (6) above, but not by e.g. *which book* in the specifier).

Regarding the lexicalisation of [fin] in C, the following can be established. In matrix clauses, as shown in (4), [fin] in C is lexicalised via verb movement, whereby the verb adjoins to C (head adjunction). In embedded clauses, a complementiser is inserted.³ there are two possible ways here. One is to insert an interrogative complementiser, see (6b), which also checks off the [Q] feature. Further, the insertion of the regular finite subordinator is possible if [wh] is checked off by an overt operator, hence in structures like (6a): this option can be observed in nonstandard varieties. Since, as the structures above demonstrated, lexicalisation of [fin] in C is generally attested in the syntactic paradigm, standard varieties in West Germanic have an exception in (6a) by not lexicalising the C head,⁴ while nonstandard varieties are completely regular in this respect. Note that the insertion of an interrogative complementiser is not a viable option in cases like (6a) since the insertion of the complementiser would check off the active interrogative feature on the C head,⁵ and hence there would be no feature attracting the wh-element to move to the CP (since [Q] is a subset of [wh], an interrogative complementiser would not be incompatible with the feature specification of the head) and thus prevent the movement of the wh-element.

The insertion of the complementiser is thus in line with the general V2 property of Germanic languages and with T-to-C movement in English interrogatives. Further, the insertion of the finite complementiser causes no interpretive difference, and several dialects show optionality with respect to the insertion of the complementiser.⁶

³While [fin] is lexicalised by verb movement in main clauses, this is generally not possible in embedded clauses: certain verbs in German allow embedded V2 and there are certain dependent clauses (such as hypothetical comparatives and conditionals) that likewise allow verb fronting. As argued by bacskaiatkaritoappear, this is due to restrictions from the matrix predicate.

⁴According to bacskaiatkaritoappear, this has to do with licensing conditions on zero complementisers (i.e., they are licensed in these environments in the standard language). In addition, the “doubly filled COMP filter” is rather the consequence of an economy principle against multiple elements with overlapping functions, which interacts with a principle favouring overt marking, see vangelder2009. This question cannot be examined here in detail.

⁵The C head is specified as [wh] and the complementiser has the feature [Q]. The two features are not fully incompatible, though, as [Q] is a subset of [wh] (cf. bayer2004). The problem with inserting the complementiser is the deactivation of the feature, as described above, not feature incompatibility.

⁶Optionality arises in certain dialects with head-sized wh-phrases that may be inserted into either the specifier or the head, see bacskaiatkari2018sardis, following bayerbrandner2008. Not all dialects have optionality, though. As there is no interpretive difference between con-

Doubling is possible in polar interrogatives as well if the operator is overt. In English, the operator *whether* can appear in embedded clauses overtly and doubling with *that* can be observed both historically and synchronically (see vangeldereren2009 for modern substandard varieties); in main clauses, its appearance is restricted to historical examples.⁷ Consider:

- (7) a. **Whether** did he open the Basket?

(*The Tryal of Thomas Earl of Macclesfield*; source: Salmon, Thomas and Sollom Emlyn (1730) A complete collection of state-trials, and proceedings for high-treason, and other crimes and misdemeanours: 1715–1725)

- b. I wot not **whether that** I may come with him or not.

'I do not know whether I may come with him or not.'

(*Paston Letters XXXI*)

As can be seen, *whether* is similar to ordinary wh-operators in triggering verb movement to C in main clauses and in allowing the insertion of *that* in embedded clauses; hence, its behaviour contrasts with that of *if*. Importantly, just like in constituent questions, there is no interpretive difference between the version with *that* and the version without *that* of the same sentence.

Regarding the separation of [wh] and [Q] mentioned above, it must be mentioned that the co-occurrence of two interrogative elements is possible in certain languages (bayer2004). This can be observed in Dutch dialects in examples like (8) below:

- (8) Ze weet wie of dat hij had willen opbellen

she knows who if that he had want call

'She knows who he wanted to call.'

(bayer2004, citing hoekstra1993)

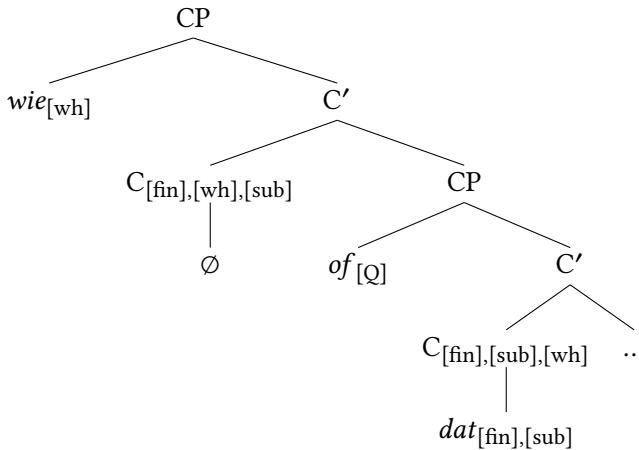
As can be seen, in this case three overt elements appear in the CP-domain: the wh-operator itself, the Q-element of 'if' and the finite complementiser *dat* 'that'.

figurations with and without the complementiser, it is actually expected that at least some dialects show optionality; note that while optionality is considered to be problematic for minimalist approaches, dialect data and diachronic data in fact support the view that at least some optionality is allowed in language, to allow gradual variation and change. These issues cannot be pursued here in detail.

⁷ As mentioned above, verb movement to C in embedded clauses is subject to restrictions (due to the matrix predicate).

Again, no interpretive difference can be attributed to the insertion of multiple elements: clauses with the combination *wie dat* ‘who that’ and clauses with a single *wie* ‘who’ have the same interpretation, too. The structure for the CP-domain in (8) is shown below:

(9)



The polar operator is in the scope of a wh-operator, and the clause is ultimately specified as [wh]: hence, even if the Q-element *of* is inserted into the lowest SpecCP, [wh] is not checked off and the CP projects further (essentially, the [wh] feature of the lower C is inherited by the higher C).

To conclude this section, it can be established that doubly filled COMP patterns in Germanic interrogatives follow from a requirement on lexicalising [fin] on C, which ultimately follows from the V2 property of Germanic languages, whereby English is slightly exceptional in that V2 is no longer attested, but the same applies to T-to-C movement in interrogatives. The expectation is therefore that genuine doubly filled COMP patterns should be different or not available in languages where there is no lexicalisation requirement on [fin] in main clause interrogatives.⁸

⁸Note that while V2 (or T-to-C) is probably necessary for genuine doubly filled COMP, it is not true the other way round: it is indeed possible that the lexicalisation of [fin] does not hold in all constructions and a language may be V2 without showing doubly filled COMP effects: for instance, Standard German (and any variety of German lacking doubly filled COMP patterns) is such a language.

3 Czech

In this section, I am going to overview the possible patterns in Czech main and embedded questions. I will show that doubling is possible, yet while the resulting combinations are in part surface-similar to their Germanic counterparts, they are associated with a particular (echo) interpretation.

Just like in English, constituent questions in Czech contain an overt wh-element fronted to the left edge of the clause:⁹

- (10) a. **Kdo** přijel?
who arrived.3SG
'Who arrived?'
b. Ptala se, **kdo** přijel.
asked.3SG.F REFL who arrived.3SG
'She asked who arrived.'

I assume that the wh-element moves to SpecCP, following **rudin1988** and **kaspar2015**.

Regarding doubly filled COMP patterns, the insertion of *že* 'that' is possible. However, this results in an interpretive difference from ordinary questions and essentially renders echo questions where the speaker asks for the value of the wh-element¹⁰ (see **kaspar2015**, **gruetskrabalova2011**):

- (11) a. **Kdo že** přijel?
who that arrived.sg.M
'WHO has arrived?'

⁹Note that I am only considering questions involving a single wh-phrase in this paper and do not venture to examine multiple wh-fronting. As argued by **boskovic2012**, multiple wh-questions actually involve the movement of a single wh-phrase due to a [wh] feature, and the remaining wh-elements are either located in situ or are fronted as focused phrases: crucially, the CP does not contain multiple [wh] features attracting various wh-elements. See also **gruetskrabalova2011** on Czech and **mismas2016** on Slovenian. In this sense, further wh-phrases and their position in the clause are not relevant to the present discussion, which is centred on clause-typing issues.

¹⁰As Jiri Kaspar (p.c.) informs me, constituent questions with *že* can be interpreted as canonical echo questions (where the value of the wh-element was inaudible), reminder questions (the speaker has forgotten the value), verification questions (the speaker is unsure about the value), and surprise questions (the speaker assumes a different value). Since all these types have been subsumed under the umbrella term "echo questions" in the literature, as opposed to ordinary questions, I will simply use the label "echo questions" in this paper but it should be kept in mind that this term subsumes various subtypes (this applies to the Slovenian data, too).

- b. ?Ptala se, **kdo že** přijel.
 asked.SG.F REFL who that arrived.SG.M
 ‘She asked who was said to have arrived.’

The sentence in (11a) is an appropriate reaction to a statement such as ‘Peter arrived’. The sentence in (11b) is the embedded version thereof; its markedness stems from the fact that it is relatively difficult to find contexts in which an embedded echo is felicitous. As far as the status of *že* is concerned, I follow kaspar2015 in assuming that this element is located in C;¹¹ hence, its co-occurrence with the wh-element in SpecCP makes the doubly filled COMP effect possible.

Consider now the following polar questions:

- (12) a. Přijela Marie?
 arrived.SG.F Mary
 ‘Has Mary arrived?’
 b. Ptala se, **jestli** Marie přijela.
 asked.SG.F REFL if Mary arrived.SG.F
 ‘She asked if Mary arrived.’

As can be seen, the embedded polar question in (12b) is introduced by *jestli* ‘if’, while its matrix interrogative counterpart in (12a) has no morphophonological marker.

The insertion of *že* ‘that’ into clauses with *jestli* is impossible:

- (13) *Ptala se, **jestli že** Marie přijela.
 asked.SG.F REFL if that Mary arrived.SG.F
 ‘She asked if Mary arrived.’

The elements *že* and *jestli* are in complementary distribution regarding their syntactic position (but not their function¹²); hence, since *že* is in C, it can be con-

¹¹As kaspar2015 shows, there is in fact more than one *že* element in Czech, see also gruetskrabalova2012; I will only concentrate on the declarative complementiser appearing in the clauses under scrutiny.

¹²This means that while they occupy the same position, C, in syntax, they do not have the same distribution and *že* cannot introduce questions by itself:

- (i) *Ptala se, **že** Marie přijela.
 asked.SG.F REFL if Mary arrived.SG.F
 ‘She asked if Mary arrived.’

cluded that *jestli* is in C, too. This is in line with the etymology of *jestli*, a grammaticalised form of the question particle *li* and the verb ‘be’: in Czech, if C is filled by the clitic *-li*, the verb moves up to C to host the clitic (schwabe2004).

In addition to the constructions so far, it should be mentioned that wh-elements may appear in polar questions headed by *jestli*, rendering an echo reading:

- (14) a. **Kdo** *jestli* přijel?
who if arrived.SG.M
'Did WHO arrive?'
b. * Ptala se, **kdo** *jestli* přijel.
asked.SG.F REFL who if arrived.SG.M
'She asked about whom the question arose whether they arrived.'

The sentence in (14a) is an appropriate reaction to a question such as ‘Did Peter arrive?’, and hence is an echo of a polar question.¹³ As can be expected, the insertion of *že* ‘that’ is again impossible:¹⁴

- (15) a. * **Kdo** *jestli že* přijel?
who if that arrived.SG.M
'Did WHO arrive?'
b. * Ptala se, **kdo** *jestli že* přijel.
asked.SG.F REFL who if that arrived.SG.M
'She asked about whom the question arose whether they arrived.'

Regarding the interrogative patterns in Czech, the following points can be established. First, doubly filled COMP effects are possible with *že* ‘that’ and with *jestli* ‘if’: both render echo questions (though these echo questions are licensed in two different kinds of context) and the elements *že* and *jestli* cannot occur together. Second, the insertion of the complementiser (in addition to the element in the specifier) is not attested in ordinary constituent questions. Third, the insertion of either complementiser (in addition to the wh-element) triggers an echo interpretation. Fourth, the complementiser is available in main clause echo questions,

¹³The impossibility of embedding such an echo, as in (14b), may well have pragmatic reasons, i.e. such a sentence is not felicitous in any context. Note that if the Czech pattern were an ordinary doubly filled COMP pattern, such as in (substandard) West Germanic, then (14b) should be grammatical and (14a) should be ruled out.

¹⁴Note that the impossibility of the combinations discussed in this paper is not merely due to their relative order: changing their relative order (e.g. *že jestli*) results in an ungrammatical configuration, too.

contrary to ordinary main clause questions, and in this way the echoed statement/question is surface-similar to an embedded clause, in line with the fact that it is dependent on a particular context in order to be felicitous.¹⁵ This is contrary to what was seen in Germanic, where no echo interpretation is attested and where complementisers are not inserted in main clause constituent questions. Fifth, the patterns in Czech suggest that the clause type reflects the properties of the complementiser, not those of the wh-element (see the discussion in §5); this is again contrary to Germanic, where the presence of a wh-element indicates that the clause is a true interrogative.

4 Slovenian

This section is going to overview the possible patterns in Slovenian main and embedded questions. I will show that doubling is possible in similar ways to what was attested in Czech; again, the resulting combinations are in part surface-similar to their Germanic counterparts, yet they are associated with a particular (echo) interpretation.

Just like in English and Czech, constituent questions in Slovenian contain an overt wh-element fronted to the left edge of the clause:

- (16) a. **Kdo** pride?
who comes
'Who is coming?' (hladnik2010)
- b. Vprašal je, **kdo** pride.
asked.SG.M AUX.3SG who comes
'He asked who was coming.' (based on hladnik2010¹⁶)

I follow golden1997 and hladnik2010 in assuming that the wh-element moves to SpecCP.

Just like in Czech, the insertion of *da* 'that' is possible; this renders echo questions (see hladnik2010):¹⁷

¹⁵Note that there are other instances of subordinating C-elements appearing in main clauses, as is the case for German *ob* 'if' in V-final main clause questions that are pragmatically distinct from ordinary questions, see e.g. zimmermann2013. Naturally, the discussion of this issue would go far beyond the scope of the present paper.

¹⁶As noted, the data are essentially taken from hladnik2010; however, the translations have been changed in accordance with what my informants gave as more natural translations.

¹⁷Just like in the Czech examples, the verb immediately follows the wh-element; however, this is not an effect of V2 in either language. In Slovenian, certain clitics, including auxiliaries, appear

- (17) a. Kdo da pride?
who that comes
'WHO is coming?' (hladnik2010)
- b. ?Vprašal je, kdo da pride.
asked.SG.M AUX.3SG who that comes
'He asked who was said to be coming.'

(based on hladnik2010)

The sentence in (17a) is an appropriate reaction to a statement such as 'Peter is coming'; the sentence in (17b) shows the embedded version and is marked for pragmatic reasons, just as was the case for its Czech counterpart. Regarding the

in a second position, as in (i):

- (i) Deček, katerega sem srečal včeraj, me je prepoznał.
boy that AUX.1SG met yesterday me AUX.3SG recognized
'The boy that I met yesterday, recognized me.' (marusic2008)

As can be seen, the clitic *je* follows the element *me*, and is hence the second element in the clause. However, as shown by (ii), it appears that *je* can follow both *kdo* and *da* in doubly filled COMP patterns:

- (ii) Kdo da je prišel?
who that AUX.3SG come.SG.M
'WHO came?'

Since *je* appears after the elements *kdo* and *da*, one might wonder whether *kdo da* is a constituent or whether *kdo* is in a higher clause. However, both options are unlikely: an element in the specifier cannot form a constituent with the C head, and postulating a higher clause to locate a single element would be highly problematic, too. I assume that *kdo* is in SpecCP and *da* in the C head of the same CP, whereby the two elements neither form a constituent nor are they located in different clauses. There is in fact no need to assume a strict surface second-position requirement on Slovenian clitics. As shown by marusic2008, analyses assuming a fixed syntactic position such as C for clitics, as by goldenmilojevicsheppard2000, face a number of problems and the relative position of the clitic should rather be considered phonological in nature (in line with general "Wackernagel" phenomena). In this case, the clitic naturally follows the element in the C head even if the specifier of the CP is filled by some additional element since there is no way of inserting the clitic in between the element in the specifier and the element in the head of a single CP projection. If the wh-element and the complementiser were located in separate projections, one might expect the clitic to intrude, which is not the case. Note that, strictly speaking, the same holds even if one assumes a fixed syntactic position for the clitic (a projection below CP or another CP, resulting in a split CP) since the filling of the specifier in a higher projection does not influence the realisation of the clitic in some lower projection.

status of *da*, I follow **hladnik2010** in assuming that it is located in C; hence, when appearing together with a wh-element, (surface) doubly filled COMP effects are possible.¹⁸

Consider now the following polar questions:¹⁹

- (18) a. A pride?
 Q comes
 ‘Is he coming?’ (based on **hladnik2010**)
- b. Vprašal je, če pride.
 asked.SG.M AUX.3SG whether comes
 ‘He asked whether he was coming.’ (based on **hladnik2010**)

As can be seen, a question particle – *a* or *če* – is licensed both in main clause and in embedded interrogatives. The insertion of *da* ‘that’ is possible in both cases and it renders an echo reading (cf. **hladnik2010**):

- (19) a. A da pride?
 Q that comes
 ‘Is it true that he is coming?’ (based on **hladnik2010**)
- b. ?Vprašal je, če da pride.
 asked.SG.M AUX.3SG whether that comes
 ‘He asked whether it was true that he was coming.’ (based on **hladnik2010**)

The sentence in (19a) is an appropriate reaction to a statement such as ‘He is coming’. Importantly, *da* and *a/če* are not in complementary distribution, which suggests that *a/če* are not in C, contrary to Czech *jestli*. Instead, in the given

¹⁸ Again, one might wonder whether the wh-element is indeed in the same CP as the complementiser *da*. In Slovenian, a null complementiser is licensed only if the wh-element is in the relevant specifier: it is not possible if the wh-phrase undergoes long distance movement, and in these cases *da* is inserted, see **golden1997**, **marusic2008fdsl**. Hence, one might think that the doubly filled COMP effect in echo questions arises merely because the complementiser has to be overt if the wh-element is in a higher clause. However, as shown by **mismastoappear**, echo questions in Slovenian are in fact possible even without *da*, which indicates that the wh-element does not move out of the clause where it is base-generated.

¹⁹ Again, I cannot examine the distribution of *a* and *če* beyond the constructions under scrutiny and will discuss only the differences within the given syntactic paradigm.

constructions they are rather operators located in SpecCP, similarly to English *whether*.²⁰

Finally, it must be mentioned that wh-elements may appear in polar questions; this renders an echo interpretation, similarly to what was observed in Czech. Note that the acceptability of these constructions in Slovenian is dependent on the dialect/idolect, as also indicated by [hladnik2010](#) in connection with all the doubling patterns, and this seems to be especially true in the case of the triple combination in (20b) below (this was not accepted as grammatical by my main informant).²¹ Consider the following examples:

The sentence in (20a) is an appropriate reaction to a question such as ‘Is Peter coming?’, and the sentence in (20b) is an appropriate reaction to a question such as ‘Is it true that Peter is coming?’. Crucially, in both sentences in (20), the Q-element is *če* and not *a*, as opposed to ordinary main clause interrogatives.²² This indicates that the difference from ordinary questions is encoded morphosyntactically, too.²³

²⁰Note that *če* can appear in conditional clauses, too; however, the discussion of this falls outside the scope of the present paper.

²¹Unfortunately, since the focus of **hladnik2010** is relative clauses, the exact geographical distribution of the interrogative patterns cannot be recovered from his thesis, and it remains unclear whether the acceptability of (20) shows relatively clear regional differences or whether the differences hold rather between idiolects. As **hladnik2010** describes in the introduction, he conducted a larger pilot study of Slovenian dialects, whereby the focus was on syntactic doubling and on variation in dialects. Altogether, over 70 responses were collected from 55 test locations; further, since Slovenian speakers acquire a regional dialect as a rule, the data are quite reliable in that they reflect regional varieties rather than the standard language.

²²As one of the reviewers informs me, this is true also if the clause is sluiced: the element *kdo* can be followed by *če* but not by *a*. This is expected if sluiced clauses are derived from regular interrogatives. Note also that in cases like (20a), the wh-element may remain in situ, in line with the assumption that the movement involved here is not genuine wh-movement but rather focusing (which preferably involves fronting); see the discussion in §5.

²³As was noted before, certain contexts license clauses that are surface-similar to ordinary embedded clauses, such as matrix questions with *ob* ‘if’ in German. The pattern in (20) again indicates that the particular echo constructions are discourse-dependent and cannot appear in the same environments as ordinary main clause questions.

Regarding the interrogative patterns in Slovenian, the following points can be established. First, doubly filled COMP effects are possible with *da* ‘that’ and *a/če* ‘if’. Second, the complementiser (in addition to the element in the specifier) is not inserted in ordinary constituent questions and may be inserted in ordinary polar questions. Third, the insertion of either complementiser (in addition to the wh-element or the Q particle in the specifier) triggers an echo interpretation. Unlike Czech, the echo of a question (a “double echo” in [hladnik2010](#)) is possible in Slovenian (at least dialectally, see (20) above). Fourth, the complementiser is available in main clause echo questions, contrary to ordinary main clause questions, and in this way the echoed statement/question is surface-similar to an embedded clause, in line with the fact that it is dependent on a particular context in order to be felicitous. This is similar to Czech and contrary to what was seen in Germanic, where no echo interpretation is attested and where complementisers are not inserted in main clause constituent questions. Fifth, the patterns in Slovenian, just like in Czech, suggest that the clause type reflects the properties of the complementiser, not those of the wh-element (see §5); this is again contrary to Germanic, where the presence of a wh-element indicates that the clause is a true interrogative.

5 The analysis

The present paper investigates various patterns involving wh-elements, Q elements and finite subordinators in Germanic and in Slavic languages. In this section, I am going to overview the behaviour of these combinations first.

The combinations observed in Germanic are given in Table 1; these combinations are attested in embedded clauses only.

Table 1: Clause typing and Germanic doubly filled COMP

sequence	clause-typing feature	clause type	examples
WH Q FIN	[wh]	constituent question	(8)
WH Q	[wh]	constituent question	–
WH FIN	[wh]	constituent question	(2a)
WH	[wh]	constituent question	(1c)
Q FIN	[Q]	polar question	(7b)
Q	[Q]	polar question	(1d)

As can be seen, the type of the clause always matches the leftmost element in the linear sequences. That is, once a wh-element is inserted, the clause can only be a constituent question. If there is no wh-element but a Q element is present, the clause can only be a polar interrogative. Naturally, a clause is always typed by the C head but certain features on the C head are checked off by elements moving to the specifier, as in wh-questions (yet the wh-elements do not themselves type the clause).

The combinations observed in Slavic (Czech and Slovenian) are given in Table 2; these combinations are attested both in embedded and in matrix clauses.

Table 2: Clause typing and Slavic doubly filled COMP

sequence	clause-typing feature	clause type	examples
WH Q FIN	[FIN]	declarative, double echo	(20b)
WH Q	[Q]	polar question, echo	(14a), (20a)
WH FIN	[FIN]	declarative, echo	(11a), (17a)
WH	[wh]	constituent question	(10b), (16b)
Q FIN	[FIN]	declarative, echo	(19a)
Q	[Q]	polar question	(12b), (18b)

As indicated, the type of the clause always matches the rightmost element in the linear sequences, contrary to the Germanic pattern. That is, once the finite complementiser is inserted, the clause is typed as a declarative, but the presence of the interrogative elements leads to an echo interpretation. Consequently, there is a split between form and function that is not attested in Germanic. If there is no finite complementiser but a Q element is present, the clause is a polar interrogative, but the presence of the wh-element leads to an echo interpretation. Again, a clause is always typed by the C head but the Slavic pattern is crucial because the insertion of an operator into the specifier does not involve feature checking with the head: the C head lacks the features associated with the operator. Ordinary questions are possible only when a single interrogative element is present.

Regarding Germanic doubly filled COMP patterns, the following can be established. On the one hand, the movement of the wh-operator or the insertion of the polar operator into SpecCP take place for clause-typing reasons and can be thus drawn back to question semantics and to the requirement on feature checking with C. On the other hand, the insertion of the finite complementiser takes place in order to lexicalise [fin] in C.

By contrast, regarding Slavic doubly filled COMP patterns, the following can

be established. On the one hand, the insertion of the operator (either a wh-operator or the polar operator) into SpecCP takes place due to an [EDGE] feature on the C head containing the elements introducing the echoed question, and there is no feature checking with C (given that there is no interrogative feature to be checked, as echo questions are not typed as interrogatives, see **boskovic2002**).²⁴ On the other hand, the insertion of the complementisers into C takes place because they type the echoed clause.

As far as echo questions are concerned, I assume that they are not true questions and are closer to focus constructions (cf. **boskovic2002**, **artsein2002**). This is in line with the analysis of **boskovic2002**, who claims that the fronting of echoed wh-phrases, as well as that of non-first wh-phrases in multiple fronting constructions, are independent of a strong [wh] feature on C. Accordingly, **boskovic2002** analyses the relevant constructions as instances of focus fronting. Hence, the interrogative interpretation arises locally, similarly to English, where there is no wh-movement in echo questions, indicating that there is no [wh] feature on the C head (cf. **boskovic2002**).

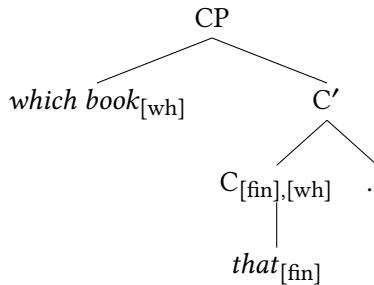
We saw earlier that Slavic languages may allow embedded echo questions, even though these configurations are marked compared to their matrix counterparts. That is, the clause can be taken by a predicate taking interrogative complements (e.g. *ask*), which is normally possible if the clause is typed as [wh]. I assume that in echo clauses this is related to feature percolation: namely, the features of the element in the specifier can percolate up and hence the interrogative property, which is interpretable on the wh-element itself, is visible to the matrix predicate.²⁵ However, there is no percolation downwards, and hence the echoed clause itself is not affected.

²⁴Note that the WH Q sequence is special in this respect because the clause is typed as a polar interrogative by the Q-element, just as the declarative clause is typed as declarative by the relevant element in C. However, this configuration is also regular in the sense that the wh-element itself does not type the clause. Importantly, there is no incompatibility between an interrogative clause type and an echo reading, provided that the interrogative is typed independently of the echoing wh-phrase.

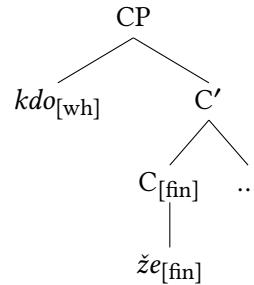
²⁵The idea of feature percolation is well known in the syntactic literature and is subject to debates concerning its exact application and restrictions. As described by **heck2008**, pied-piping has been treated in terms of feature percolation of the wh-feature since **chomsky1973**, whereby the wh-feature projects to the DP-level and then percolates up to the PP level, that is, it is allowed to cross a phrase boundary. Essentially the same is proposed here in terms of the wh-feature percolating up to the CP, without causing changes in the C head itself (just like in the case of PPs, where feature percolation does not change the properties of the P). Naturally, this again raises the question how far a feature is allowed to percolate, the discussion of which clearly cannot be carried out in the present paper.

Consider now the structures for WH FIN sequences in Germanic (here: English) and Slavic (here: Czech), respectively:

(21) a.



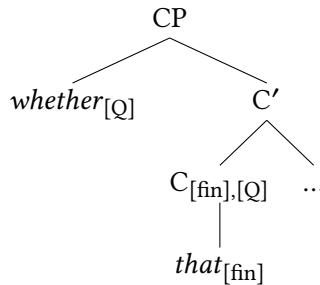
b.



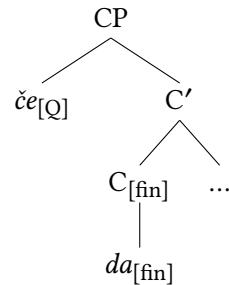
As can be seen, both configurations result in a doubly filled COMP pattern. However, the C is specified as [wh] only in (21a), which is a true interrogative, while the Slavic pattern in (21b) is an echo question. The complementiser is inserted in certain dialects in Germanic to lexicalise [fin], while Slavic complementisers are inserted to type the clause.²⁶

Consider now the structures for Q FIN sequences in Germanic (here: English) and Slavic (here: Slovenian), respectively:

(22) a.



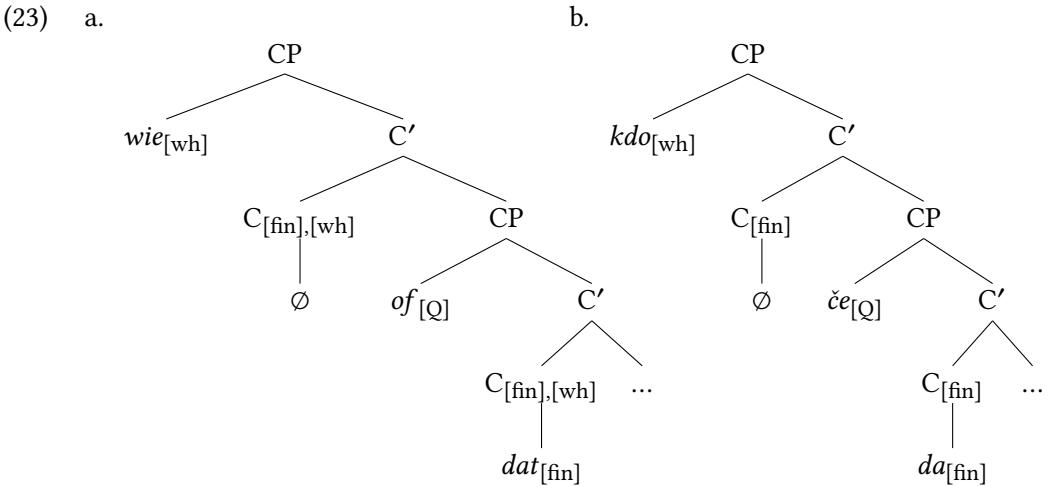
b.



Again, the surface doubling configuration results in doubly filled COMP patterns in both cases. The C is specified as interrogative, this time as [Q] , only in Germanic, see (22a), while in Slavic the question is merely echo, see (22b). Further, the complementiser is inserted in certain dialects in Germanic to lexicalise [fin], while Slavic complementisers are inserted to type the clause.

Finally, consider the structures for WH Q FIN sequences, in Germanic (here: Dutch) and Slavic (here: Slovenian), respectively:

²⁶Note that this does not mean that the complementiser is always overt. Declarative complementisers tend to have zero counterparts cross-linguistically and the same applies to e.g. že and da, too. This means that echo questions are possible without the insertion of an overt že, too. This option has not been discussed in detail here because the present paper is devoted to doubling patterns in the CP-domain.



As can be seen, the CP is split in both cases,²⁷ yet the C head is specified as [wh] only in the Germanic case, see (23a), while the Slovenian configuration represents an echo, see (23b). In (23a), the [wh] feature of the lower C head is not checked off, since the polar operator in SpecCP is merely [Q], a subset of [wh]; hence, the CP projects further. In (23b), there is no feature checking associated with either of the operators; they are inserted to render the echo reading. Again, the finite complementiser is inserted in certain dialects in Germanic to lexicalise [fin], while Slavic complementisers are inserted to type the clause.

The differences between Germanic and Slavic essentially go back to differences in the requirement of lexicalising [fin]: since this requirement is present in Germanic, the finite complementiser is inserted merely due to this requirement, while its appearance in Slavic doubly filled COMP constructions contributes to the echo reading by way of typing the clause merely as [fin] but not as [wh] or [Q].

6 Conclusion

This paper investigated doubly filled COMP effects in Germanic and Slavic (more precisely, Czech and Slovenian). It was shown that while the two language groups represent similar surface configurations, they differ crucially in the distribution

²⁷In the model adopted here, based on bacskaiatkari2018sardis, the CP is split if certain features have to project further to be checked off but there is no predefined cartographic template in the sense of rizzi1997. However, the assumption that there can be multiple CPs (similarly to VPs) is widespread in the literature.

and the interpretation of these structures. In Germanic, doubly filled COMP arises due to a requirement on filling a C head specified as [fin]; this is in line with the general properties of V2 (e.g. in German) and T-to-C (English). Importantly, the insertion of the finite complementiser takes place only in embedded questions and it brings interpretive differences from complementiser-less clauses. In Slavic, doubly filled COMP arises in echo questions and the complementiser is inserted to type the clause, while the element in the specifier does not check off its features with the head. The insertion of the complementiser involves an important interpretive difference from complementiser-less clauses, since the lack of the complementiser is associated with ordinary questions, while the presence of the complementiser triggers an echo interpretation. Taking all this into account, it can be concluded that the differences between Germanic and Slavic doubly filled COMP structures can be accounted for in a principled way.

Abbreviations

3	third person	PTCP	participle
AUX	auxiliary	Q	question particle/marker
F	feminine	REFL	reflexive
M	masculine	SG	singular

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Tatiana Bondarenko

Keywords: ditransitives, repetitives, datives, small clauses, Russian

Chapter 2

Russian datives again: On the (im)possibility of the small clause analysis

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In this paper I use the interpretation of the repetitive adverb *opjat'* ‘again’ in Russian to argue that ditransitive structures in this language do not involve a small clause structure (Beck-Johnson 2004; *Kayne* 1984; a.o.). Under the syntactic approach to the semantics of repetitives that I adopt (von Stechow 1996; Beck 2005; a.o.), the interpretation of repetitives is determined by their attachment in the syntactic representation. I show that in Russian ditransitives, unlike in English ones (Beck-Johnson 2004), only the repetitive reading of ‘again’ is possible, and argue that no reason other than a difference in the syntactic structures of ditransitives in two languages can account for that. I also observe that unlike datives that are found in ditransitives, “higher” dative arguments and locative applicatives in Russian can occur in constructions where there is a syntactic constituent denoting the resultant state, and thus the restitutive reading of repetitives is available.

1 Introduction

In this paper I will discuss applicability of the small clause analysis (Beck-Johnson 2004; Pylkkänen 2008; *Kayne* 1984; Harley 1996, among others) that has been proposed for the English double object construction (1) to constructions with dative arguments in Russian (2).¹

- (1) John gave Mary a letter.

¹All examples in this paper are either in English or in Russian, unless explicitly indicated otherwise.

- (2) Vasja otdal {Maše pis'mo / pis'mo Maše}.
 Vasja gave Masha.DAT letter.ACC letter.ACC Masha.DAT
 'Vasja gave Masha a letter.'

The small clause analysis involves the idea that in ditransitive constructions a direct object and an indirect object are merged together forming a small clause excluding the verb. This idea is shared by a variety of approaches (Beck-Johnson 2004; Jung-Miyagawa 2004; Pylkkänen 2008; Schäfer 2008; HarleyJung 2015; Kayne 1984; Pesetsky 1995; Harley 1996; 2002; Cuervo 2003; McIntyre 2006; Lomashvili 2010, among others), which diverge on the exact nature of this formation (small clause / low applicative / PP / HaveP) and a few other details of the derivation. The tree in Figure 1 (adapted from Harley 2002) illustrates a version of this analysis for the English double object construction in (1): the direct object (*a letter*) and the indirect object (*Mary*) are combined with the help of a special P_{HAVE} , and the resulting PP becomes a complement of the verb.

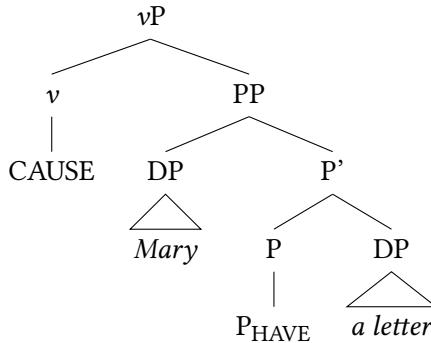


Figure 1: Double object construction (adapted from Harley 2002: 4)

The small clause analysis makes use of lexical decomposition in syntax: different subevents of a predicate are represented by different projections in syntax ($v_{DO/CAUS}P$ for a causing subevent, SC / $ResultP$ / $HaveP$ / PP for a result state subevent, among some others). Under such approach to the syntax-semantics interface, indirect objects differ with respect to where they are introduced in the syntactically represented lexical decomposition of a given verb (Schäfer 2008; Cuervo 2003; among others). Their positions account for different interpretations and different syntactic properties. Indirect objects in the English double object construction are participants of the result state subevent under the small clause analysis.

The aim of this paper is to argue that Russian ditransitive verbs like *otdavat'*

‘give’ in (2) should not be analyzed as involving a small clause structure. While English might decompose ditransitive verbs in syntax (*give* as CAUSE to HAVE), Russian does not exhibit the decomposition of this sort. My argumentation employs the idea that repetitive morphemes like *again* single out subevents in the semantics of a predicate, and thus, are able to detect the exact placement of indirect objects in syntactic structures with lexically decomposed verbs. If an indirect object denotes a participant of some subevent e_1 , then it should be in the scope of a repetitive adverb that singles out that subevent e_1 . I will try to show that Russian has constructions where a dative argument is a participant of a stative subevent of a predicate, but ditransitive sentences are not among such constructions.

The crucial observation for my proposal is that the restitutive reading of AGAIN is available in English ditransitive sentences – in both the DOUBLE OBJECT CONSTRUCTION, see (3), and the TO-PP CONSTRUCTION, see (4), but not in Russian, no matter if the dative argument precedes the accusative one, as in (5), or conversely, see (6).^{2,3}

- (3) Thilo gave Satoshi the map again. DOUBLE OBJECT CONSTRUCTION

 - a. **Repetitive:** Available
'Thilo gave Satoshi the map, and that had happened before.'
 - b. **Restitutive:** Available
'Thilo gave Satoshi the map, and Satoshi had had the map before.'

(Beck-Johnson2004: 113)

(4) Thilo gave the map to Satoshi again. TO-PP CONSTRUCTION

 - a. **Repetitive:** Available
'Thilo gave Satoshi the map, and that had happened before.'
 - b. **Restitutive:** Available
'Thilo gave Satoshi the map, and Satoshi had had the map before.'

(Beck-Johnson2004: 116)

(5) Maša opjat' otdala Vase knigu. DAT > ACC

Masha again gave Vasja.DAT book.ACC

²I do not want to imply that (5) and (6) are equivalents of English double object construction and *to*-PP construction correspondingly. The sentences in (5)-(6) just show that the availability of the restitutive reading does not depend on the relative word order of dative and accusative arguments in Russian.

³I use AGAIN to refer to this kind of repetitive adverbs generally and words in italics (English *again*, Russian *опять*) to refer to concrete lexical items of languages.

- a. **Repetitive:** Available
‘Masha gave Vasja the book, and that had happened before.’
 - b. **Restitutive:** Unavailable
‘Masha gave Vasja the book, and Vasja had had the book before.’
- (6) Maša opjat' otdala knigu Vase. ACC > DAT
Masha again gave book.ACC Vasja.DAT
- a. **Repetitive:** Available
‘Masha gave Vasja the book, and that had happened before.’
 - b. **Restitutive:** Unavailable
‘Masha gave Vasja the book, and Vasja had had the book before.’

Under the restitutive reading, the subevent that is singled out by AGAIN is the state of possession between the indirect object and the direct object. For example, in (3) and (4) it is the reading when a state of Satoshi having the map is being repeated.⁴ This reading is impossible for Russian ditransitives: in (5) and (6) AGAIN cannot single out the state of Vasja having the book. The example in (7) illustrates that providing more context does not increase the availability of the restitutive reading in Russian ditransitives.

- (7) *Context:* Vasja had always had the book *Two captains* by Kaverin; he had never given it to anyone. One day he accidentally left the book at Masha's place...

⁴An anonymous reviewer asks whether the presence of the restitutive reading entails the small clause analysis for the PP datives, given the logic of Beck-Johnson2004. While the analysis for the PP datives is not spelled out in detail in Beck-Johnson2004, one can infer from the discussion therein that the authors propose distinct syntactic structures for the double object construction and the *to*-PP construction, both of which include a small clause. Given the logic of Beck-Johnson2004, the double object construction includes a small clause that consists of the two objects merging with the help of a functional projection (XP), which is then combined with the verb. The *to*-PP construction under their view presents a subcase of a more general NP + PP pattern. In sentences of this sort V merges directly with a PP and takes an NP as its specifier. The PP under consideration contains a null PRO as its subject that corefers with the NP that is the specifier of the verb. Thus, as the authors themselves put it, the PP becomes in effect a small clause (Beck-Johnson2004: 118). In other words, the presence of the restitutive reading in (4) under the logic of Beck-Johnson2004 does entail the presence of a small clause in the syntactic structure but does not necessarily entail that the syntactic structures of the double object construction and the *to*-PP construction are identical.

2 Russian datives again: On the (im)possibility of the small clause analysis

- a. # I togda Maša opjat' {otdala / otpravila / vernula} Vase
and then Masha again gave sent returned Vasja.DAT
knigu.
book.ACC

Intended: ‘And then Masha gave / sent / returned Vasja the book,
and Vasja had had the book before.’

- b. # I togda Maša opjat' {otdala / otpravila / vernula} knigu
and then Masha again gave / sent / returned book.ACC
Vase.
Vasja.DAT

Intended: ‘And then Masha gave / sent / returned the book to Vasja,
and Vasja had had the book before.’

Why does Russian differ from English with respect to the availability of the restitutive reading in ditransitives? Does this difference reflect different syntactic structures of ditransitive sentences in these languages? Does Russian have constructions with dative arguments where AGAIN is able to single out the stative subevent of a predicate? These questions will be central to the forthcoming discussion.

This paper is structured as follows. In §2 I will introduce the syntactic approach to the meaning of AGAIN and discuss how the availability of the restitutive reading in English ditransitives argues for the small clause analysis. In §3 I will argue against Russian ditransitives involving a small clause structure. I will consider different potential reasons for the unavailability of the restitutive reading in Russian ditransitive sentences and conclude that it has a syntactic explanation. In §4 I will discuss constructions with higher dative arguments and show that in these sentences the stative subevent can be singled out, but the dative argument is not a participant of it. In §5 I will provide evidence that dative arguments in Russian can in principle be participants of the stative subevent of a predicate and that a construction with locative applicatives exemplifies such a case. §6 concludes the paper.

2 The small clause analysis of ditransitives: Evidence from AGAIN

In this paper I will assume the syntactic approach to the ambiguity of repetitive adverbs (Beck-Johnson2004; Alexiadou-etal2014; Lechner-etal2015; von

Stechow 1996; Beck 2005; among others), according to which different readings of AGAIN are attributed to different attachments of AGAIN in the syntactic representation. Under this approach the semantics of AGAIN is taken to be always the same and involve repetition of some event:⁵

- (8) $\llbracket \text{again} \rrbracket(e)(P)$
 - a. = 1 iff $P(e) \wedge \exists e' [e' <_{\tau} e \wedge P(e')]$
 - b. = 0 iff $\neg P(e) \wedge \exists e' [e' <_{\tau} e \wedge P(e')]$
 - c. undefined otherwise

The semantics in (8) states that AGAIN takes an event e and a property of events P as its arguments and returns 1 if the property is true of the event and 0 if the property is not true of the event. The crucial part of AGAIN's meaning is a presupposition that there is another event that temporally precedes ($<_{\tau}$) the event under consideration of which the property is true. If the presupposition is not met, the meaning of AGAIN is undefined. Under the syntactic approach different readings of AGAIN arise due to its modification of different subevents in the syntactically represented lexical decomposition: the subevent that is modified by AGAIN is understood as being repeated.

Beck-Johnson2004 claimed that the presence of the two readings of *again* with the double object construction provides support for the small clause analysis of English ditransitives. If ditransitive verbs such as *give* are lexically decomposed into the subevent denoting the action undertaken by an agent (represented in syntax by v) and the stative subevent (represented in syntax by a small clause – HaveP), then *again* should be able to attach to both vP and HaveP and modify the respective subevents, giving rise to the repetitive-restitutive ambiguity. This expectation is borne out, as we have observed in (3) (repeated here as (9)). The fact that indirect objects are understood as participants of stative subevents of ditransitive verbs suggests that they are inside a small clause that represents a given stative subevent syntactically. The analysis that Beck-Johnson2004 propose for sentences like (9) is sketched out in (10) and (11) (for the repetitive and the restitutive reading, respectively).⁶

⁵There is a competing semantic approach to the ambiguity of repetitives (FabriciusHansen2001; Jäger-Blutner2000; among others), according to which different readings of AGAIN emerge due to the lexical ambiguity of repetitive morphemes. In this paper I will not discuss the applicability of the semantics approach to the data under consideration.

⁶Smallcaps in semantic formulas indicate metalinguistic translations of object language. For instance, $\llbracket \text{Satoshi} \rrbracket = \text{SATOSHI}$. This means that AGAIN in semantic formulas equals $\llbracket \text{again} \rrbracket$ (the meaning of the word *again*) and not the cover term for English *again* and Russian *опять*, used elsewhere in the body of the paper.

- (9) Thilo gave Satoshi the map again.

a. **Repetitive**

‘Thilo gave Satoshi the map, and that had happened before.’

b. **Restitutive**

‘Thilo gave Satoshi the map, and Satoshi had had the map before.’

(Beck-Johnson2004: 113)

- (10) **Repetitive reading**

a. $[\nu P \ [\nu P \text{ Thilo } [\text{give} \ [\text{BECOME} \ [\text{HaveP} \text{ Satoshi HAVE the map}]]] \text{ again}]$

b. $\lambda e. \boxed{\text{AGAIN}}(e)(\lambda e_1. \text{GIVE}(e_1)(\text{THILO})$

$\wedge \exists e_2 [\text{BECOME}(e_2)(\lambda e_3. \text{HAVE}(e_3)(\text{THE MAP})(\text{SATOSHI}))$

$\wedge \text{CAUSE}(e_2)(e_1)]$

c. ‘Once more, a giving by Thilo caused Satoshi to come to have the map.’

(Beck-Johnson2004: 114)

- (11) **Restitutive reading**

a. Thilo [give [BECOME [HaveP [HaveP Satoshi HAVE the map] again]]]

b. $\lambda e. \text{GIVE}(e)(\text{THILO}) \wedge \exists e_1 [\text{BECOME}(e_1)$

$(\lambda e_2. \boxed{\text{AGAIN}}(e_2)(\lambda e_3. \text{HAVE}(e_3)(\text{THE MAP})(\text{SATOSHI})))$

$\wedge \text{CAUSE}(e_1)(e)]$

c. ‘A giving by Thilo caused Satoshi to come to once more have the map.’

(Beck-Johnson2004: 114)

In (10) *again* attaches to the *vP* denoting the whole event of Thilo giving Satoshi the map, giving rise to the repetitive interpretation. In (11) *again* attaches to the small clause that denotes the stative event of Satoshi having the map, thus the restitutive reading arises.

For Beck-Johnson2004 there are no elements CAUSE and BECOME in the syntactic representation of ditransitive sentences. Syntax provides a verb that takes a small clause as its complement, and it’s the semantic component that is responsible for introducing components like CAUSE and BECOME that are required for deriving the correct interpretations. It was proposed by von Stechow (1995) (and further employed in Beck-Johnson2004 and Beck 2005) that the following special semantic principle is at work in structures with small clauses:

- (12) **Principle R**

If $\alpha = [\nu \gamma [\text{sc} \beta]]$ and β is of type $\langle s, t \rangle$ and γ is of type $\langle e, \dots \langle e, \langle s, t \rangle \rangle \rangle$ (an n -place predicate), then

$$\llbracket \alpha \rrbracket = \lambda x_1 \dots \lambda x_n \lambda e . \llbracket \gamma \rrbracket(e)(x_1) \dots (x_n) \\ \wedge \exists e_1 [\text{BECOME}(e_1)(\llbracket \beta \rrbracket) \wedge \text{CAUSE}(e_1)(e)].$$

(adapted from Beck 2005: 7)

This principle ensures that a verb (an n -place predicate) is properly “glued” with a small clause (a property of events) by inserting CAUSE and BECOME components into the semantics representation.

This line of reasoning (Beck-Johnson 2004), which makes use of the syntactic decomposition of ditransitive verbs into a verb and a small clause and of the syntactic approach to the ambiguity of repetitive morphemes, allows naturally to explain the possible interpretations of English *again* in the double object construction.⁷ In the next section I will discuss why a similar logic is not applicable to the case of Russian ditransitives.

3 Russian ditransitives: Against the small clause analysis

There could be potentially different reasons for why restitutive readings are not available in Russian ditransitive clauses. The first hypothesis that I will explore is that the Russian repetitive adverb *opyat'* has different properties than English *again*. It has been observed that not all repetitive morphemes across languages have the ability to access different subevents inside decomposition structures (Rapp-vonStechow 1999; Alexiadou-etal 2014; Lechner-etal 2015; Beck 2005). For example, the German repetitive adverb *erneut* ‘again’ cannot have restitutive readings with lexical accomplishment verbs like *öffnen* ‘open’, unlike another repetitive adverb *wieder* ‘again’; see (13) and (14).⁸

⁷ There has been another attempt to explain the repetitive-restitutive ambiguity of *again* in the English double object construction by Bruening (2010), who argues for the asymmetrical applicative analysis of English ditransitives: a verb merges with a direct object first, and then the VP combines with an applicative head that introduces an indirect object as its specifier. Unlike under a small clause analysis, under this syntactic analysis the two interpretations of *again* do not fall out for free: special assumptions about verb head movement, object movement and interpretation of copies are required in order to obtain both repetitive and restitutive readings in ditransitive structures.

⁸ Note that the unavailability of the restitutive reading in (13) cannot be due to its verb form (which is different from the one in (14)), since the use of the same form as in (14) does not lead to the availability of the restitutive reading:

- (i) ... dass Maria die Tür erneut öffnete. (German)
that Maria the door again opened
 - a. Repetitive: Available
‘...that Maria opened the door, and that had happened before.’

2 Russian datives again: On the (im)possibility of the small clause analysis

- (13) Maria hat die Tür erneut geöffnet.
Maria has the door again opened
- Repetitive:** Available
'Maria opened the door, and that had happened before.'
 - Restitutive:** Unavailable
'Maria opened the door, and the door had been open before.'
- (German; Beck 2005: 12)
- (14) ... dass Ali Baba Sesam wieder öffnete
that Ali Baba Sezam again opened
- Repetitive:** Available
'...that Ali Baba opened Sezam, and that had happened before.'
 - Restitutive:** Unavailable
'...that Ali Baba opened Sezam, and Sezam had been open before.'
- (German; adapted from von Stechow 1996: 3)

This variation with respect to the ability of adverbs to single out different subevents in the syntactically represented lexical decomposition of predicates was captured by the Visibility Parameter (Rapp-vonStechow1999; Beck 2005):

- (15) **The Visibility Parameter for decomposition adverbs**
A D(ecomposition)-adverb can / cannot attach to a phrase with a phonetically empty head.
- (Rapp-vonStechow1999 via Beck 2005: 13)

Under the assumption that lexical accomplishments in (13) and (14) involve a small clause with a null head that corresponds to the stative subevent of the door / Sezam being open, the Visibility Parameter states that the difference between German *wieder* and *erneut* is that the former, but not the latter can attach to a phrase with a phonetically null head, hence only the former can have the restitutive reading in sentences with lexical accomplishments.

The following question can then be asked about Russian *opjat'*: Is it an adverb that can attach to a phrase with a phonetically empty head? It turns out that *opjat'* can single out the stative subevent of lexical accomplishments, see (16) and (17), thus classifying as a decomposition adverb that can "look inside" the

b. **Restitutive:** Unavailable
'...that Maria opened the door, and the door had been open before.'

decomposition structure and modify subevents that are not expressed by overt phonetic material. *Opjat'* is not different from German *wieder* or English *again* in this respect.

- (16) Vasja opjat' otkryl dver'.
Vasja again opened door.ACC
a. **Repetitive:** Available
'Vasja opened the door, and that had happened before.'
b. **Restitutive:** Available
'Vasja opened the door, and the door had been open before.'
- (17) Vasja opjat' opustošil butylku.
Vasja again emptied bottle.ACC
a. **Repetitive:** Available
'Vasja emptied the bottle, and that had happened before.'
b. **Restitutive:** Available
'Vasja emptied the bottle, and the bottle had been empty before.'
- (18) Ali Baba opened Sezam again.
a. **Repetitive:** Available
'Ali Baba opened Sezam, and that had happened before.'
b. **Restitutive:** Available
'Ali Baba opened Sezam, and Sezam had been open before.'

Note that unlike *wieder* and *again*, Russian *opjat'* occurs preverbally, see (5)–(7), (16), and (17), which does not prevent it from being able to have restitutive readings see (16) and (17).⁹ The fact that *opjat'* generally allows for restitutive readings

⁹The situation is different for English and German, where the pre-object position of repetitive adverbs makes the restitutive reading unavailable, see (i) and (ii).

- (i) Ali Baba again opened Sezam.
a. **Repetitive:** Available
'Ali Baba opened Sezam, and that had happened before.'
b. **Restitutive:** Unavailable
'Ali Baba opened Sezam, and Sezam had been open before.'
- (ii) ... dass Ali Baba wieder Sesam öffnete. (German)
that Ali Baba again Sezam opened
a. **Repetitive:** Available

when it precedes the verb suggests that the word order in (5)–(7) cannot be the reason for the unavailability of restitutive readings in ditransitive clauses. To sum up, it seems highly unlikely that the properties of *opjat'* prevent restitutive readings in Russian ditransitives.

A second hypothesis that I will consider is that restitutive readings are unavailable in Russian ditransitives due to the absence of a stative subevent in semantics of ditransitive verbs. I will argue that this hypothesis is also wrong: ditransitives have a stative subevent in their semantics, which can independently be detected by another Russian adverb, namely *obratno* ‘back’/‘again’, and can be introduced into syntax with the help of an eventive goal PP. Crucially, I will argue that the stative subevent is not represented in the syntactic decomposition of ditransitive verbs that take just an accusative argument and a dative one.

The Russian adverb *obratno* ‘back’/‘again’ (glossed below simply as OBRATNO), although similar in its meaning to *opjat'*, has different semantics, which involves a return to a state in which an entity had been before (as observed already by Tatevosov 2016). As a consequence, it can modify only descriptions with a target state in the sense of (Kratzer 2000) and allows for restitutive readings only (19).

- (19) *Context* (after Lechner-etal2015): Three students – Masha, Vasja, and Petja – were studying in the library. They wanted the window in the library to be open, but the librarian wanted the window to be closed. Masha opened the window, but the librarian closed it. Vasja opened the window, but the librarian closed it. Petja opened the window, but the librarian closed it. Finally, Masha opened the window for the second time.
- a. # Rovno odin student otkryl okno obratno.
exactly one student opened window.ACC OBRATNO
'Exactly one student opened the window again.'
 - i. **Repetitive reading:** Unavailable

'... that Ali Baba opened Sezam, and that had happened before.'

- b. **Rstitutive:** Unavailable
'... that Ali Baba opened Sezam, and Sezam had been open before.'

Unlike English *again* and German *wieder*, Russian *opjat'* is generally not very good in a sentence-final position and is mostly used in the preverbal position.

‘There exists a student that opened the window and had opened it before, and it is not true that other students opened the window and had opened it before.’

(exactly one x > again > x opened the window > the window was open)

ii. **Restitutive reading:** False

‘There exists a student that opened the window and no other student opened the window and the window had been open before.’

(exactly one x > x opened the window > again > the window was open)

b. Rovno odin student opjat' otkryl okno.

exactly one student again opened window.ACC

‘Exactly one student opened the window again.’

i. **Repetitive reading:** True

‘There exists a student that opened the window and had opened it before, and it is not true that other students opened the window and had opened it before.’

(exactly one x > again > x opened the window > the window was open)

ii. **Restitutive reading:** False

‘There exists a student that opened the window and no other student opened the window and the window had been open before.’

(exactly one x > x opened the window > again > the window was open)

(adapted from Tatevosov 2016: 31)

Alexiadou-etal2014 and Lechner-etal2015 observed that the repetitive and the restitutive readings exhibit different truth conditions in contexts with non-monotone quantifiers like ‘exactly’ or ‘only one student’. For the context in (19), sentences with subjects that are non-monotone quantifiers are true only under the repetitive reading of AGAIN, see (19b-i) vs. (19b-ii). While *opjat'* can have repetitive readings and thus (19b) is appropriate in the context provided, *obratno* is illicit in this context because it cannot have repetitive readings.

Obratno “looks into” the semantics of a verbal phrase with which it merges and searches for a target state in this semantic representation that it can modify. As the sentence in (20) shows, *obratno* is able to find a target state in the semantic representation of Russian ditransitives.

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- (20) Maša {otdala / otpravila / vernula} Vase knigu obratno.
 Masha gave sent returned Vasja.DAT book.ACC OBRATNO
 'Masha gave / sent / returned Vasja the book, and Vasja had had the book before.'

Elaboration of the analysis of properties of Russian *obratno* is beyond the scope of this paper. What is important for us here is that *obratno* can serve as a diagnostic for a stative subevent: it shows us that a result state is present in semantics of ditransitive predicates.¹⁰

Another piece of evidence that Russian ditransitive verbs have a stative subevent in their semantics comes from the comparison of ditransitive constructions with a dative and an accusative argument with constructions with the same verbs that take an accusative argument and a goal PP. Consider the following two sentences with the verb *otpravlyat* 'send':

- (21) Maša opjat' otpravila {Vase igrušku / igrušku Vase}.
 Masha again sent Vasja.DAT toy.ACC toy.ACC Vasja.DAT
 a. Available: 'Masha sent Vasja the toy, and that had happened before.'
 b. Unavailable: 'Masha sent Vasja the toy, and Vasja had had the toy before.'
- (22) Rukovoditel' opjat' otpravil sotrudnika v Moskву.
 manager again sent employee.ACC in Moscow

¹⁰There could be different plausible explanations for the unavailability of repetitive readings with *obratno*. For example, it could be the case that *obratno* is actually not a VP-level adverb but a PP modifier which in some cases signals the presence of a silent PP. Some support in favor of this hypothesis is provided by examples like (i) and (ii), where *obratno* seems to form a constituent with an overtly realized PP (the examples involve a movement of *obratno* + PP – scrambling and wh-movement, respectively):

- (i) [Obratno v Moskву] Vasja rešil prixat'.
 OBRATNO to Moscow Vasja decided come.INF
 'Vasja decided to come back to Moscow.'
- (ii) [Obratno v kakoj gorod] oni otpravilis'?
 OBRATNO in what city they went
 'What city did they go back to?'

If *obratno* is a PP modifier, then it follows that it can have exclusively restitutive readings. Under this hypothesis, *obratno* signals the presence of a silent goal PP in (20), which introduces the stative subevent into the syntactic representation that was otherwise not present. I will not pursue this idea here, leaving it for the future research.

- a. Available: ‘The manager sent the employee to Moscow, and that had happened before.’
- b. Available: ‘The manager sent the employee to Moscow, and the employee had been in Moscow before.’

When this verb takes an accusative argument and a dative one (21), the restitutive reading of *opjat'* is unavailable. When, however, it takes an accusative argument and a goal PP (22), *opjat'* is able to single out the subevent that denotes the state of the theme argument (the employee) being at the location specified by the goal PP (Moscow).

This difference can also be observed with PPs headed by *k* ‘to’, which can take animate noun phrases as their complements. Sentences with ditransitive verbs that take a direct object and a *k*-PP, see (24), seem almost synonymous to those with ditransitive verbs that take two objects, see (23); but the restitutive reading is available only in the former construction.

- (23) Maša opjat' otpravila knigu Kate.
Masha again sent book.ACC Katja.DAT
- a. **Repetitive:** Available
‘Masha sent the book to Katja, and that had happened before.’
 - b. **Restitutive:** Unavailable
‘Masha sent the book to Katja, and Katja had had the book before.’
- (24) Maša opjat' otpravila knigu k Kate.
Masha again sent book.ACC to Katja.DAT
- a. **Repetitive:** Available
‘Masha sent the book to Katja, and that had happened before.’
 - b. **Restitutive:** Available
‘Masha sent the book to Katja, and Katja had had the book before.’

If we assume that ditransitive verbs like *otpravljalat'* ‘send’ have uniform semantics across their uses, then it follows that they should have a stative subevent in their semantic representation, since it is visible in some clauses with these verbs.

Why does the presence of a goal PP make the restitutive reading available in sentences with ditransitive verbs? I would like to suggest that the reason for that is that PPs, unlike dative arguments, can be eventive (see McIntyre 2006) and introduce subevents that are present in the semantics of a predicate into the syntactic representation. This difference between dative arguments and goal PPs, as well as the fact that they can co-exist in the same clause, see (25) (cf. English (26)),

suggests that PP ditransitives and ditransitives with dative arguments cannot be derivationally related.

- (25) a. Oni otpravili {ej vrača / vrača ej} v školu.
they sent her.DAT doctor.ACC doctor.ACC her.DAT in school
'They sent a doctor into the school for her.'
 - b. Ja brosil {Vasje mjač / mjač Vasje} v ruki.
I threw Vasja.DAT ball.ACC ball.ACC Vasja.DAT in hands
'I threw a ball to Vasja, into his hands.'
- (26) a. * They sent her a doctor into the building.
b. * I threw Fred a ball into his hands.

(McIntyre 2011)

To sum up, sentences with Russian ditransitive verbs can have restitutive readings in two cases. First, the adverb *obratno* can access a target state in the semantic representation of a verbal phrase. Second, a goal PP can introduce a target state into the syntactic representation, making the restitutive reading available even with the repetitive adverb *opjat'*, which requires a syntactic constituent corresponding to the result state. This suggests that the unavailability of restitutive readings with dative arguments cannot be explained by the absence of a stative subevent in the semantics of Russian ditransitives.

If Russian *opjat'* has the same properties as English *again* and Russian ditransitives have a stative subevent in their event structure, then we have to conclude that for some reason this stative subevent is not represented in syntax. In other words, no small clause (or HaveP / PP / LowApplP) is present in Russian ditransitive sentences with dative arguments. Why is it the case that such a small clause cannot be built? I will first explore a semantic hypothesis: the relevant structure can be built, but cannot be interpreted due to absence of the interpretation Principle R in Russian.

It has been argued (Beck-Snyder 2001; Snyder 2001; Beck 2005) that the interpretation Principle R is not universal: languages differ with respect to whether they have a principle allowing to successfully interpret the combination of a verb and a small clause, and this variation is responsible for the (un)availability of a number of constructions, including resultatives, verb-particle constructions, *put*-locative constructions, *make-causative* constructions and the double object construction, among others. Could it be the case that Russian is one of the languages that do not have the Principle R?

This hypothesis is dubious, since Russian seems to require some version of this principle independently for interpreting other constructions.¹¹ One example of a case where such a principle would be needed is sentences with verbs that take lexical prefixes.

- (27) Vasja za-brosil mjač v vorota.
 Vasja PVB-throw ball in goal
 ‘Vasja threw the ball into the goal.’

Svenonius (2004) has proposed that lexical prefixes in Russian, such as *za* in (27), enter the derivation as heads of small clauses that are complements of verbs. Under this view, lexical prefixes head their own projections and take PPs as their complements and direct objects as their subjects (Figure 2).

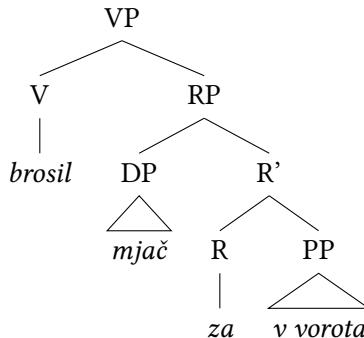


Figure 2: Lexical prefixes as heads of small clauses

This analysis receives additional support from the fact that *opjat'* can have the restitutive reading in sentences with verbs with lexical prefixes. Consider (28):

- (28) *Context:* This ball was lying inside the goal for as long as we can remember. For the first time someone threw the ball out of the goal. But five minutes later...
 Vasja opjat' za-brosil mjač v vorota.
 Vasja again PVB-throw ball in goal
 ‘Vasja threw the ball into the goal, and the ball had been in the goal before.’

¹¹As an anonymous reviewer points out, Russian does have resultative constructions. For example, one type of Russian resultatives is discussed in Tatevosov (2010). I am grateful to the anonymous reviewer for this observation, which provides an additional argument against the inaccessibility of Principle R in Russian.

Opjat' in (28) has the interpretation under which an event that has occurred before is the event of the ball being inside the goal. Under the syntactic approach to the ambiguity of AGAIN, this suggests that there is a syntactic constituent – a small clause, which represents the stative subevent of the predicate and to which *opjat'* can attach (Figure 3).

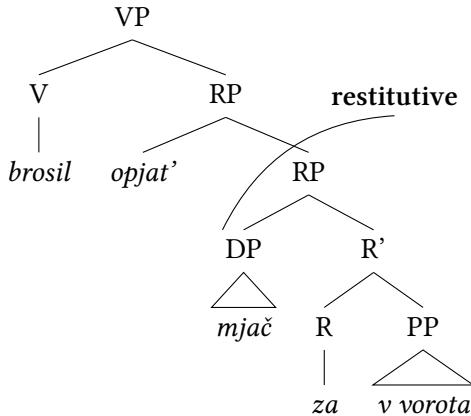


Figure 3: The small clause analysis of Russian *zabrosit* ‘throw’

If Russian did not have means of interpreting the combination of a verb and a small clause (the Principle R or its equivalent), then the sentence in (28) should be uninterpretable and thus lead to a derivation crash. This implies that uninterpretability cannot be the problem that prevents building a small clause structure for sentences with ditransitive verbs in Russian.

This brings us to the conclusion that ditransitive sentences with dative arguments in Russian do not contain a small clause for syntactic reasons: the structure with SC / HaveP / LowApplP / particular kinds of null P/R cannot be built. As a consequence, under our assumption that the availability of the restitutive reading entails lexical decomposition in syntax,¹² the syntax of ditransitive clauses in Russian significantly differs from the syntax of similar sentences in English. If English might decompose *give* syntactically as CAUSE to HAVE, this sort of decomposition does not take place in Russian. A more general consequence follows from this difference between the two languages: the lexical decomposition for a given predicate cannot be universal; languages differ with respect to how

¹²An anonymous reviewer reasonably points out that this assumption is not shared by everyone working on double object constructions. The conclusions that I argue for in this paper follow only if this assumption is retained.

they map event structures of similar predicates onto syntactic representations.

4 Restitutive readings with Russian datives: Higher datives

Dative arguments can differ with respect to how they are related to a result state of a given predicate. In this section I will show that restitutive readings of *opjat'* are available in sentences with higher, non-subcategorized dative arguments, but that in these clauses dative noun phrases do not denote participants of stative subevents singled out by *opjat'*.

Clauses with non-subcategorized dative arguments and predicates like *otkryt' dver'* ‘open the door’ do not exhibit the restitutive reading when dative arguments follow the verb (29), but are able to escape the scope of AGAIN when they are scrambled to the left of it, in which case the restitutive reading becomes available (30):

- (29) Vasja opjat' otkryl {Maše dver' / dver' Maše}.
Vasja again opened Masha.DAT door.ACC door.ACC Masha.DAT
- a. **Repetitive:** Available
‘Vasja opened the door for Masha, that had happened before.’
 - b. **R^{estitutive}:** Unavailable
‘Vasja opened the door for Masha, the door had been open before.’
- (30) Vasja Maše opjat' otkryl dver'.
Vasja Masha.DAT again opened door.ACC
- a. **Repetitive:** Available
‘Vasja opened the door for Masha, and that had happened before.’
 - b. **R^{estitutive}:** Available
‘Vasja opened the door for Masha, and the door had been open before.’

As can be seen from the restitutive reading of (30), the dative argument is not interpreted as a participant of the stative subevent of the predicate *otkryt' dver'* ‘open the door’. The interpretation in (30b) states that Vasja did some activity for Masha that resulted in the repeated state of the door being open. This suggests that non-subcategorized datives are introduced higher than the syntactically represented stative subevents.

Note that scrambling of dative arguments to the left of *opjat'* in ditransitive sentences does not feed the restitutive reading:

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- (31) *Context:* Vasja had always had the book *Two captains* by Kaverin; he had never given it to anyone. One day he accidentally left the book at Masha's place...

I togda Maša Vase opjat' {otdala / otpravila / vernula}
 and then Masha Vasja.DAT again gave sent returned
 knigu.
 book.ACC

Intended: 'And then Masha gave / sent / returned Vasja the book, and Vasja had had the book before.'

This means that stative subevents are not represented in the syntax of ditransitives with dative arguments. If they were present in the syntactic representation, they could be singled out at least in cases when datives are scrambled.

The fact that the restitutive reading of *opjat'* is available in sentences with non-subcategorized datives, in contrast to ditransitive sentences with datives, is concordant with the proposal that non-subcategorized dative arguments are introduced higher than VPs (Boneh-Nash2017). One piece of evidence for this comes from the fact that sentences with non-subcategorized datives show asymmetrical binding: only the dative argument can bind the accusative one, but not the other way around:

- (32) a. * Šaman zakoldoval oxotnikov drug drugu.
 shaman jinxed hunters.ACC each other.DAT
 b. Šaman zakoldoval oxotnikam drug druga.
 shaman jinxed hunters.DAT each other.ACC
 c. * Šaman zakoldoval drug drugu oxotnikov.
 shaman jinxed each other.DAT hunters.ACC
 d. ?? Šaman zakoldoval drug druga oxotnikam.
 shaman jinxed each other.ACC hunters.DAT

(Intended:) 'The shaman jinxed the hunters for each other.'

(Boneh-Nash2017)

It can be shown that evidence from binding and from the scope of *opjat'* go hand in hand: sentences with non-subcategorized datives, in which the dative argument asymmetrically binds the direct object, exhibit restitutive readings when the dative argument is scrambled outside the scope of *opjat'*:

- (33) *Context:* Two hunters have been born jinxed and have been this way for a long time. One day a good witch relieved them from the jinx. But after

some time, they had a huge fight and were very angry with each other.
Each of them came to the shaman to ask him to jinx the other one.

Šaman oxotnikam opjat' zakoldoval druga
shaman hunters.DAT again jinxed each other.ACC

'Shaman jinxed the hunters for each other, and the hunters had been
jinxed before (but the shaman had never jinxed them before)'

Thus, non-subcategorized datives are introduced higher than VPs and cannot be understood as participants of stative subevents of predicates. But if a predicate has a stative subevent, it can be successfully singled out by *opjat'* in case the dative argument is scrambled to the left of the repetitive adverb.

5 Restitutive readings with Russian datives: Locative applicatives

In the previous section I have discussed a case of the restitutive reading in structures with a dative argument which was not a participant in the stative subevent singled out by *opjat'*. In this section I will show that Russian also has a construction in which a dative argument is a participant of the stative subevent detected by the restitutive *opjat'*.

The construction under consideration, which I will call the LOCATIVE APPLICATIVE CONSTRUCTION ("N-applicatives" in the terminology of Pshekhotskaya 2012), usually involves a motion verb that takes a direct object, a goal PP and an optional dative argument:

- (34) Maša opjat' položila knigu Vase na stol.
Masha again put book.ACC Vasja.DAT on table
- a. **Repetitive:** Available
'Masha put the book on the table for Vasja, and that had happened before.'
 - b. **Restitutive:** Available
'Masha put the book on the table for Vasja, and Vasja had had the book on the table before.'

In (34) the dative argument is interpreted as a possessor of the small clause that represents the stative subevent "the book is on the table": Vasja's having the book on the table is being repeated.

The locative applicative construction is not found exclusively with motion verbs, it is also sometimes possible with lexical causatives (35) and change-of-state predicates (36).

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- (35) Vasja opjat' posadil dočku Maše na stul.
 Vasja again seated daughter.ACC Masha.DAT on chair
- a. **Repetitive:** Available
 ‘Vasja seated the daughter on the chair for Masha, and that had happened before.’
 - b. **Restitutive:** Available
 ‘Vasja seated the daughter on the chair for Masha, and Masha had had the daughter sit on the chair before.’
- (36) Maša opjat' pobelila stenu mame v komnate.
 Masha again whitened wall.ACC mother.DAT in room
- a. **Repetitive:** Available
 ‘Masha whitened the wall in the room for the mother, and that had happened before.’
 - b. **Restitutive:** Available
 ‘Masha whitened the wall in the room for the mother, and the mother had had the wall white in the room before.’

The dative argument in this structure is merged lower than the direct object, as the evidence from binding suggests: the dative reciprocal can be bound by the direct object, but the accusative reciprocal cannot be bound by the dative argument:

- (37) a. Vasja posadil devoček drug drugu na stulja.
 Vasja seated girls.ACC each other.DAT on chairs
 ‘Vasja seated the girls – A and B – in such a way that A has B sitting on A’s chair and B has A sitting on B’s chair.’
 (Literally: Vasja seated the girls_i to each other_i on the chairs.)
- b. *Vasja posadil drug druga devočkam na stulja.
 Vasja seated each other.ACC girls.DAT on chairs
 Intended: ‘Vasja seated the girls – A and B – in such a way that A has B sitting on A’s chair and B has A sitting on B’s chair.’
 (Literally: Vasja seated each other_i to the girls_i on the chairs.)

The example in (38) shows that the dative reciprocal that is bound by the direct object can be a participant of the stative subevent identified by *opjat’*:

- (38) Vasja opjat' posadil devoček drug drugu na stulja.
 Vasja again seated girls.ACC each other.DAT on chairs

a. **Repetitive:** Available

'Vasja seated the girls – A and B – in such a way that A has B sitting on A's chair and B has A sitting on B's chair, and that had happened before.'

(Literally: Vasja seated *girls_i* to each other_i on the chairs, and that had happened before.)

b. **Restitutive:** Available

'Vasja seated the girls – A and B – in such a way that A has B sitting on A's chair and B has A sitting on B's chair, and there was a situation before where A had B sitting on A's chair, and B had A sitting on B's chair.'

(Literally: Vasja seated *girls_i* to each other_i on the chairs, and the *girls_i* had sat by each other_i on the chairs before.)

It can also be demonstrated that the dative argument forms a constituent with the locative phrase. When a dative argument is a wh-word, it can pied-pipe the prepositional phrase to the left periphery:

- (39) a. [Komu na stol] Maša položila knigu?
who.DAT on table Masha put book.ACC

'Which person *x* is such that Masha put a book for *x* on *x*'s table?'

- b. [Komu na stul] Vasja posadil devočku?
who.DAT on chair Vasja seated girl.ACC

'Which person *x* is such that Vasja seated a girl for *x* on *x*'s chair?'

- c. [Komu v školu] Maša otdala syna?
who.DAT in school Masha gave son.ACC

'Which person *x* is such that Masha gave her son to *x*, to *x*'s school?'

I would like to propose that in the locative applicative construction the dative noun phrase is an applicative argument that is introduced on top of the PP that introduces a stative subevent into the syntactic representation. Since applicative heads introduce an abstract HAVE relation between the applied argument and the complement of Appl (Cuervo 2003; McIntyre 2006; among others), the fact that the dative argument in Russian locative applicatives is interpreted as a holder of the state that the PP denotes is expected if the dative argument is applied to an eventive PP; see (40) and Figure 4.¹³

¹³The structure in Figure 4 feeds the relevant (restitutive) interpretation. In order to derive the

- (40) Vasja opjat' povesil kartinu Kate na stenu.
 Vasja again hung picture Katja.DAT on wall
- Repetitive:** Available
 ‘Vasja hung the picture for Katja on the wall, and that had happened before.’
 - Restitutive:** Available
 ‘Vasja hung the picture for Katja on the wall, and Katja had the picture on the wall before.’

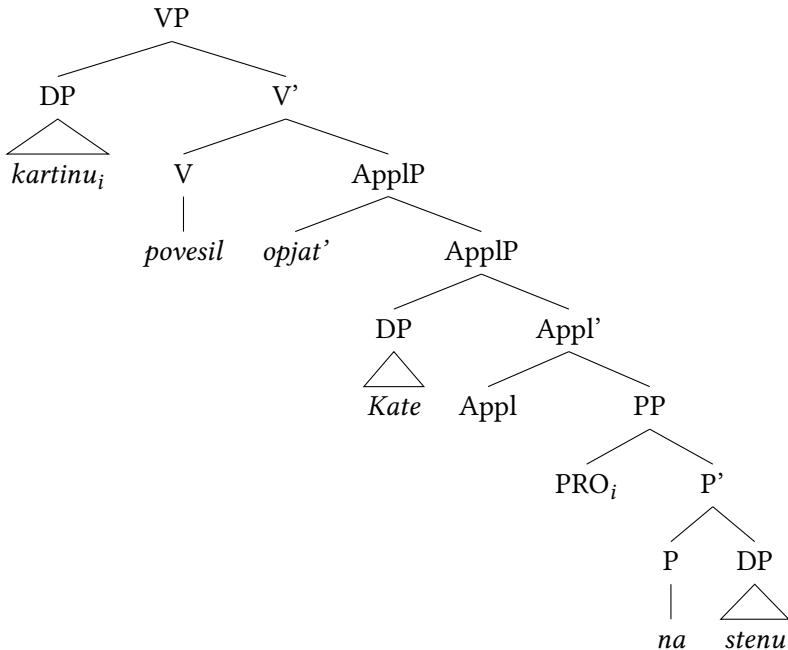


Figure 4: The locative applicative construction (40)

The restitutive reading of *opjat''* in this construction arises when *opjat''* attaches to an applicative phrase (Figure 4) and takes scope over the stative subevent denoted by a goal PP. The dative argument falls inside the scope of *opjat''* since it is an applied argument of an eventive PP and not an argument of the verb.

attested word order, cf. (40), I assume that later in the derivation the lexical verb *povesil* ‘hung’ undergoes further movement to Asp (see Harizanov-Gribanova 2018 for discussion), and the repetitive adverb *opjat'* moves to a position before the verb (the arguments for a movement analysis of repetitives that were proposed in Xu 2016 for Chinese hold for Russian as well), with subsequent reconstruction into its base position at LF.

6 Conclusions

In this paper I have argued against the small clause analysis of Russian ditransitives. I have observed that although Russian repetitive adverb *opjat'* has the same ability to look inside the decomposition structure as English *again*, it cannot have the restitutive reading in clauses with ditransitive verbs that take two objects, in contrast to *again* in the English double object construction. I have shown that Russian ditransitives have stative subevents in their semantics and that the unavailability of a small clause structure for Russian ditransitives cannot be explained by a semantic restriction, since the Principle R or its equivalent that allows to interpret a combination of a verb and a small clause is independently required for other constructions of Russian. I have concluded that the small clause structure is not present in Russian ditransitives due to syntactic reasons: the syntax cannot build such a structure. The unavailability of the restitutive reading in Russian ditransitives suggests that they are not equivalent to the English double object construction or the *to*-PP construction. They also cannot be analyzed as involving a silent (incorporated) P, since the structure with a PP would make the restitutive reading available. Although the new empirical data discussed in this paper is compatible with several analyses of ditransitives (for example, with applicative analysis (Bruening 2010) or non-derivational analysis along the lines of (Boneh-Nash2017) and does not settle on a particular one, it clearly shows that Russian ditransitives do not involve a small clause structure and differ from English ditransitives significantly.

I have also examined two other constructions with dative arguments in Russian, both of which allow for the restitutive reading of *opjat'*. In sentences with “high” datives the restitutive reading is available if the dative argument escapes the scope of *opjat'*. The dative does not denote a participant of the stative subevent in this case, which means that it cannot be introduced into the structure lower than the first subevent of the predicate. In the locative applicative construction, the dative argument is a participant of the subevent introduced by a PP and is inside the scope of the restitutive *opjat'*. I have argued that in this construction the dative is an applied argument to the PP, and therefore is always lower than the direct object, forms a constituent with the PP and can be inside the scope of *opjat'* under the restitutive reading.

Abbreviations

ACC	accusative
DAT	dative

INF	infinitive
PVB	preverb

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Chapter 3

Imperfective past passive participles in Russian

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Contra the received view that Russian past passive participles (PPPs) can only be derived from perfective verb forms, we show that imperfective (IPF) PPPs can be found in corpora as well. A substantial subset of these should receive a compositional analysis, given that they can be used in periphrastic passive constructions with predictable meaning contribution. However, these IPF PPPs commonly require a modifier and occur with a particular information structure, often accompanied by a marked word order, where the event described by the PPP is backgrounded (occurs first) and focus is on the modifier (appearing somewhere after the PPP). We propose an analysis, under which such uses of the IPF are parallel to definite descriptions, in the sense that the IPF signals an anaphoric link to a previously introduced or inferable eventive discourse referent, and the modifier provides new information about this event.

Keywords: presuppositional imperfective, passive, past passive participle, Russian

1 Introduction

In Russian, as in other Slavic languages, there are two types of passives. The REFLEXIVE PASSIVE is formed by the reflexive marker/postfix *-sjá*, whereas the PERIPHRASTIC PASSIVE combines a past passive participle (PPP) with a form of *byt'* ‘be’. It is generally assumed for Russian (but not necessarily for other Slavic languages; see §4) that the two types of passives are aspectually restricted (babbybrecht⁷⁵),

in the sense that imperfectives only appear in reflexive (1), perfectives only in periphrastic passives (2).

- (1) a. Storož otkryval vorota.
watchman.NOM opened.IPF gates.ACC
'The watchman opened/was opening a/the gate.'
- b. Vorota otkryvalis' storožem.
gates.NOM opened.IPF.RFL watchman.INSTR
'The gate was (being) opened by a/the watchman.'
- c. *Vorota byli otkryvany storožem.
gates.NOM were opened.IPF.PPP watchman.INSTR
- (2) a. Storož otkryl vorota.
watchman.NOM opened.PF gates.ACC
'The watchman opened a/the gate.'
- b. Vorota byli otkryty storožem.
gates.NOM were opened.PF.PPP watchman.INSTR
'The gate was opened by a/the watchman.'
- c. *Vorota otkrylis' storožem.
gates.NOM opened.PF.RFL watchman.INSTR

In this paper, we show that this is an oversimplified view. In particular, we address the occurrence of imperfective PPPs in Russian periphrastic passives, such as (3), which, according to the generalization exemplified above should either not exist at all or be at most exceptional.¹

- (3) Oni byli šity kornjami berezy ili vereska i byli očen'
they were sewn.IPF roots.INSTR birch.GEN or heather.GEN and were very
krepki.
tough
'They were sewn with birch or heather roots and were very tough.'

From a purely morphological perspective, and also from a cross-Slavic perspective, nothing is wrong with imperfective PPPs per se. While (4) shows that PPPs are regularly derived from perfective verbs, we can see in (5) that imperfective ones exist as well.²

¹There are also possibly exceptional examples for reflexive passives of perfective verbs; see, e.g., *schoorlemmer95* and *fehrmann+10* for relevant examples.

²In this paper we set aside long form PPPs and focus on short form PPPs only, such as those in (4) and (5), since these are the ones used in passives (see *borik14* for further discussion).

- (4) a. *sdelat'* ‘make.PF’ > *sdelan* ‘made.PF’
 - b. *rasserdit'* ‘make.angry.PF’ > *rasseržen* ‘made.angry.PF’
 - c. *zakryt'* ‘close.PF’ > *zakryt* ‘closed.PF’
- (5) a. *delat'* ‘make.IPF’ > *delan* ‘made.IPF’
 - b. *slyšat'* ‘hear.IPF’ > *slyšan* ‘heard.IPF’
 - c. *krasit'* ‘paint.IPF’ > *krasen* ‘painted.IPF’

Nevertheless, the received view is that imperfective PPPs like those in (3) and in (5) are rare, idiomatic or frozen forms that function like adjectives (svedova80; schoorlemmer95). A common strategy in the discussion of periphrastic passives in Russian is therefore to completely ignore such participles (babbybrecht75; paslawskastechow). A non-standard and somewhat more refined view, and one that we share, is found in knjazev07, who notes that imperfective PPPs are somehow restricted in use, in comparison to more “regular” perfective ones. However, he does not give a formal account of their semantics, nor a detailed description of when and why such participles appear.

Our goal in this paper is to show, based on naturally occurring data in a corpus, that imperfective past passive participles are indeed participles, not only by name and by their morphology, but also by their distribution. We show that they can be participles, not adjectives, based on their predictable compositional semantics, as well as their occurrence in regular periphrastic passive constructions, both verbal and adjectival. We argue that a subgroup of such participles constitutes a case of the presuppositional imperfective (gronndiss), a subtype of the so-called general-factual imperfective, which expresses the sheer fact that an/the event took place.

Among the readings generally associated with the imperfective aspect in Russian, the general-factual reading, which we will have more to say about in §2.3, is the most well-studied one. It is usually characterized as a non-canonical reading, in which the imperfective aspect is in “aspectual competition” with the perfective aspect (mathesius38). Canonical imperfective meanings that in Russian are expressed almost exclusively by imperfective forms are process and habitual readings.

As a side note we want to emphasize that we reserve the terms (im)perfective for morphological forms of a given verb, regardless of the semantics associated with such forms in a given context. In particular, we study imperfective forms used in contexts that might semantically be called perfective, namely completed bounded events in the past.

The paper is structured as follows. §2 outlines the empirical generalization from our corpus study and establishes that imperfective PPPs appear in regular periphrastic passives. We also show that the imperfective contexts that such participles are found in express non-canonical imperfective meanings, and we hypothesize that they always involve either the existential or the presuppositional subtype of the general-factual imperfective. §3 provides an analysis of presuppositional imperfective PPPs and provides further arguments in favour of such an analysis. Finally, §4 concludes and gives an outlook on further research questions and open issues.

2 The data

We extracted data from the Russian National Corpus (RNC) (ruscorpora.ru) of 109,028 documents, which contained 22,209,999 sentences and 265,401,717 words. Based on the grammatical features `partcp,praet,pass,ipf`, we focused on imperfective past passive participles directly preceding or following a finite form of *byt* ‘be’ (BE). Respectively, we found 2,632 and 17,015 contexts, and this reflects the unmarked word order status of BE preceding the participle. Our search thus excludes participles with non-finite or a null form of BE (i.e. present tense), participles as second conjuncts in coordination with, e.g., other participles, etc. Since we used the non-disambiguated corpus version, we manually excluded biaspectral forms, which are marked as imperfective in the RNC, such as *obeščan* ‘promised’, *velen* ‘ordered’, and verbs in *-ovat*’ (e.g. *ispol'zovan* ‘used’, *realizovan* ‘realized’). We furthermore excluded all long form participles, given that only short form participles canonically appear in Russian periphrastic passive constructions. Finally, we excluded errors in tagging, such as *Sezan* (the French painter Cézanne), *strašen* ‘terrible/scary.ADJ’ (tagged as a participle), or perfective participles erroneously tagged as imperfective (e.g. *otvečen* ‘answered.PF’). Given these limitations, we will not provide a quantitative analysis.

In the following, we will show that imperfective PPPs are not limited to idiomatic expressions, but that we find regular, repeated forms with predictable compositional meaning (§2.1) that occur in both adjectival and verbal passives (§2.2). We will therefore conclude that such participles (both adjectival and verbal ones) need to be accounted for, uniformly, and not just discarded as exceptions.³

³A reviewer points out that our data sound archaic. However, we carefully separated all the truly archaic examples (e.g., 17th–18th century and before); only one of those appears in the paper, in (10), and we state explicitly that this is an archaic example. All the other examples here are mostly from literary sources from the 1950s–60s, so they cannot be classified as ‘archaic’. We

In §2.3 we will conjecture that imperfective PPPs always involve the general-factual meaning of the imperfective aspect.

2.1 Non-idiomatic, regular imperfective past passive participles

A first research question was to see whether the widespread assumption, briefly outlined in §1, according to which all imperfective PPPs are idiomatic or frozen forms that should be analyzed as adjectives, withstands closer data scrutiny. Of course we found idiomatic participles, such as the idiom *ne lykom šit*, which is literally ‘not sewn with bast fiber’ but means ‘not simple(-minded)’. There are also fixed expressions, such as *rožden/kreščen* ‘born/baptized’, and genuine adjectives, such as *viden*, literally ‘seen’ but actually meaning ‘visible’.

However, we found a number of regular, repeated forms with predictable meaning. A non-exhaustive list of such participles is given in (6).

- (6) *pisan* ‘written.IPF’, *čitan* ‘read.IPF’, *pit* ‘drunk.IPF’, *eden* ‘eaten.IPF’, *delan* ‘made.IPF’, *šit* ‘sewn.IPF’, *čekanen* ‘minted.IPF’, *bit* ‘beaten.IPF’, *strižen* ‘haircut.IPF’, *myt* ‘washed.IPF’, *brit* ‘shaved.IPF’, *kormlen* ‘fed.IPF’, *nesen* ‘carried.IPF’, *govoren* ‘said.IPF’, *prošen* ‘asked.IPF’, *zvan* ‘called.IPF’, *kusan* ‘bitten.IPF’, *kryt* ‘covered.IPF’, *njuxan* ‘smelled.IPF’

We take these forms to be regular because we found various occurrences (tokens) of a given participle (type), in combination with different types of arguments. We furthermore take them to be compositional because we could not detect any idiomatic or idiosyncratic meaning in the contexts we found them in, when compared to the base verbs they are derived from. In particular, their meaning is composed of the meaning of the underlying verb and the meaning of the past passive participle (under any account of such participles; see §2.2 for further discussion).

To get a first impression of the data, some relevant examples in context are given in (7)–(9), which we leave uncommented at this moment but will come back to in later discussion.

- (7) V silu delikatnosti situacii gosti zvany byli s
in power delicacy.GEN situation.GEN guests called.IPF were with
osobym razborom.
particular selection

‘Due to a delicate situation the guests were invited upon careful selection.’

think that the reviewer might not be used to these kinds of examples because they are not part of the literary norm.

- (8) Ništo vam, prinjuxaetes', i ne takoe njuxano bylo.
nothing you.DAT.PL sniff.PF and not such smelled.IPF was
'It does not matter, you will get used to the smell, there are worse smells.'
- (9) Bylo pito, bylo edeno, byli slezy prolijy.
was drunk.IPF was eaten.IPF were tears poured.PF
'(Things) were drunk, (things) were eaten, tears were shed.'

As (6)–(9) show, compositional imperfective past passive participles are not limited to one particular verb class. Nevertheless, our manual check reveals that they are often formed from verbs of saying ('say', 'ask', etc.) and incremental verbs ('write', 'sew', etc.), though not exclusively. This suggests that there might still be lexical restrictions, but this could also be due to limitations of the corpus. In §4 we speculate why this might be the case.

We furthermore found no contemporary participles derived from secondary imperfectives. The ones we did find are all archaic, i.e. at least from before the 19th century, such as the biblical (10).

- (10) V leto 7010 mesjaca avgusta v šestoe na Preobraženie
in summer 7010 month.GEN august.GEN in sixth on transfiguration
Gospoda našego Iisusa Xrista načata byst' podpisvana
lord.GEN our.GEN Jesus.GEN Christ.GEN begun.PF be.AOR signed.si
cerkov' [...]
church

'In the summer of 7010 on August 6th, on the day of the transfiguration of our Lord Jesus Christ they begun to decorate the walls of the church (lit.: the church was begun to be painted).'

We therefore conclude for now that PPPs formed from secondary imperfectives are at most extremely rare, and in §4 we will provide some informal discussion as to why this may be.

To sum up, there are clearly compositional imperfective PPPs, which cannot simply be discarded as exceptional but need to be accounted for. Let us then turn to the kinds of passives that imperfective PPPs occur in.

2.2 Imperfective past passive participles in periphrastic passives

In this section we address the question whether imperfective PPPs can be found in all kinds of passives. For example, if there were only adjectival participles, proponents of a lexical approach to such participles could still maintain that they are

adjectives, not related to imperfective verbs. This would then still be in line with the widespread assumption that there are no imperfective PPPs in periphrastic passives, which are then always verbal. It should be noted, however, that we do not take adjectival participles to be non-decomposable adjectives, so ultimately we would want to provide a compositional account that also covers adjectival participles.

Let us give some general background on verbal vs. adjectival passives. We follow the, by now, standard assumption that adjectival participles involve adjec-tivization and combine with a copula, whereas verbal participles ‘stay’ verbal and combine with an auxiliary. For languages like English, German, and Spanish, it has been argued (*gehrkesub15; gehrkenllt; gehrkemarcolingua; alexiadou+lingua*) that unlike with verbal passives, the underlying event in adjectival passives lacks spatiotemporal location or referential event participants, and only the state associated with the adjectival participle can be located temporally. Therefore, spatiotemporal event modifiers, referential by-/with-phrases, and similar such expressions that need to access an actual event, can only appear with verbal participles. In (11), this contrast is illustrated with examples from German, which makes a formal distinction between verbal and adjectival passives: the former appear with the auxiliary *werden* ‘become’ and the latter with the copula *sein* ‘be’.⁴

- (11) a. Der Mülleimer {*ist / wird} {von meiner Nichte / mit der Heugabel} geleert.
 the rubbish bin is becomes by my niece with the pitchfork emptied
 ‘The rubbish bin is *(being) emptied {by my niece / with the pitchfork}.’
- b. Der Computer ist vor drei Tagen repariert #(worden).
 the computer is before three days repaired become.PPP
 ‘The computer {#is / has been ~ was (being)} repaired three days ago.’

The modifiers in (11) relate to a spatiotemporally located event token with referential event participants, and we assume, following the above-mentioned literature, that only verbal participles make available such an event token. In contrast, non-referential by-phrases, (12a), and manner modifiers, (12b), which, we assume, derive an event subkind, are acceptable with adjectival participles.

⁴These and the following German examples are based on examples discussed in *gehrkenllt* and literature cited therein.

- (12) a. Die Zeichnung ist / wird von einem Kind angefertigt.
the drawing is becomes by a child produced
'The drawing is (being) produced by a child.'
- b. Das Haar war / wurde ziemlich schlampig gekämmmt.
the hair was became rather slopp(il)y combed
'The hair was (being) combed in a rather sloppy way.'

Finally, since adjectival passives always make available a state, any state-related modification is acceptable as well (see op.cit. for examples).

For Russian, we follow schoorlemmer95 and borik13; borik14 in taking short form perfective PPPs to be either verbal or adjectival; in principle, this should also hold for imperfective ones. We take the same modifier restrictions illustrated for German in (11)–(12) to hold for Russian adjectival participles, even if we cannot see from the form of BE alone whether we are dealing with an adjectival or a verbal participle. For example, the temporal modifier in (13) (discussed in borik14, after an example from paslawskastechow) does not locate the state associated with the participle but the underlying event, and therefore, irrespective of the presence/absence of BE, we have to be dealing with a verbal participle that makes available an event token for modification.

- (13) Dom (byl) postroen v prošlom godu.
house.NOM was built.PF in last year
'The house was built last year.'

Thus, if we find such event-related modifiers in our data with imperfective PPPs, we can take these to be verbal. This would then refute (or at least seriously jeopardize) the claim that they can appear only in adjectival passives.

As the examples in (14) show, we indeed found imperfective PPPs co-occurring with such event-related modifiers, highlighted in boldface. In (14a) we find a temporal modifier that locates the underlying event. (14a)–(14c) contain by-phrases (in Russian: instrumental-marked nominals), which are referential, since they contain a proper name, a personal pronoun, and an (inherently definite) possessive pronoun, respectively. In (14d) we have a definite spatial expression locating the underlying event.

- (14) a. Pisano éto bylo Dostoevskim v 1871 godu [...]
written.IPF that was Dostoevskij.INSTR in 1871 year
'That was written by Dostoevskij in 1871.'

- b. Recepty im pisany byli i na drugoe imja [...]
prescriptions he.INSTR written.IPF were and on other name
'The prescriptions were written by him for different names as well.'
- c. Éto [...] vedeno bylo moeju rukoj!
this led.IPF was my.INSTR hand.INSTR
'This was orchestrated by me (lit. led by my hand)'
- d. [...] sleduja tem putem, kotorym neseno bylo v
following that.INSTR path.INSTR which.INSTR carried.IPF was in
Gefsimaniju dlja pogrebenija telo Bogomateri
Gethsemane for burial body Mother of God
'...on the same path on which the body of the Mother of God was
brought to Gethsemane for the burial'

We thus conclude that imperfective PPPs can appear in unambiguously verbal passives and can therefore not be reduced to adjectives.

On the other hand, it is also not the case that all imperfective PPPs are verbal. The following two examples illustrate adjectival PPPs: (15a) involves a non-referential instrumental case-marked NP that characterizes the state that the house is in,⁵ and the adverbial manner modifier in (15b) can only describe a resulting haircut 'style', but not the process of cutting hair.

- (15) a. Kryt byl dom solomoj [...]
covered.IPF was house hay.INSTR
'The house was covered with hay.'
- b. My oba byli striženy nagolo [...]
we both were haircut.IPF bald
'We were both shorn / we both had shaven heads.'

We therefore conclude this section by stating that imperfective PPPs appear in both verbal and adjectival passives in Russian, and that their distribution is not limited to a specific passive construction. In the next section, we turn to the meaning expressed in such passives, namely the general-factual meaning of the imperfective aspect.

⁵We take 'cover' here to be used as a stative extent predicate, rather than an eventive change-of-state predicate; see gawron09.

2.3 General-factual imperfective past passive participles

In this section, we discuss the imperfective contexts that the participles in question appear in. We could corroborate knjazev07's (knjazev07) generalization that they are found in non-progressive imperfective contexts only. In particular, we hypothesize that all the examples with imperfective PPPs that we found can be analyzed as one or the other type of the general-factual meaning of the imperfective. In the following, we give a brief introduction to this kind of reading.

2.3.1 The general-factual meaning of the Russian imperfective

The term GENERAL-FACTUAL (*obščefaktičeskoe*) goes back to maslov59 (mehlig16). While this is a well-discussed imperfective meaning, there is no real consensus in the literature (gronndiss) as to the precise empirical delineation of this meaning, the question whether or not there are subtypes and if there are, how many, or the theoretical account: Is this an imperfective meaning in its own right, or is it a subtype of core imperfective meanings (i.e. process or iterative/habitual)? What most authors agree on, however, is that factual imperfectives are in aspectual competition with their perfective counterparts, in the sense that in many such contexts the imperfective can be replaced by the perfective, with only subtle meaning differences. In particular, if we are to find a meaning difference at all, it has nothing to do with, e.g., a completed event for the PF and an incompletely completed one for the IPF. We illustrate this with some of paduceva96's (paduceva96) classical general-factual examples in (16), and their perfective counterparts in (17).

- (16) a. Ja ubiral komnatu včera.
I cleaned.IPF room.ACC yesterday
'I cleaned the room yesterday.'
- b. Gde apel'siny pokupali?
where oranges.ACC bought.IPF.PL
'Where did they/you buy the(se) oranges?'
- (17) a. Ja ubral komnatu včera.
I cleaned.PF room.ACC yesterday
'I cleaned the room yesterday.'
- b. Gde apel'siny kupili?
where oranges.ACC bought.PF.PL
'Where did they/you buy the(se) oranges?'

In both these examples, we are dealing with one-time completed events in the past (cleaning the room and buying oranges), no matter whether the IPF or the PF is used.

gronnidiss discerns two subtypes of the general-factual meaning: EXISTENTIAL and PRESUPPOSITIONAL.⁶ Existential imperfectives often (but not always) have intonational focus on the verb and are incompatible with precise temporal expressions locating an event. Thus, if we find temporal modifiers at all, these have to be rather vague, or they are temporal frame adverbials specifying a larger interval within which a (series of) event(s) happened (at some point in time or other). There are also contexts which actually require existential imperfectives, such as the epistemically indefinite *kogda-nibud'* 'ever' in (18).

- (18) Ty kogda-nibud' {pročityval /#pročital / čital} roman Prusta
you ever read.SI read.PF read.IPF novel Proust.GEN
do konca?
until end
'Have you ever read a novel by Proust to the end?' (gronndiss)

Since we will mostly focus on the other type of factual meaning, the presuppositional one, we will not discuss theoretical accounts of existential imperfectives here. Informally this reading can be characterized as ‘there was (at least) one event of that type’, or, under negation, ‘there was no (~ never any) event of that type’ (mehlig01; mehlig13; muellerkrat; muellerPI; gehrkemueller). We follow a more general assumption in the literature that the use of existential imperfectives is due to the non-uniqueness, or temporal indefiniteness / non-specificity of the event; when this is marked explicitly, e.g. by *kogda-nibud* in (18), the use of the perfective becomes impossible (see op.cit. for further discussion).

Presuppositional imperfectives, in turn, come with a different information structure: The verb is never accentuated, and focus is on some other constituent in the sentence. This imperfective use is found in the examples in (16) and is furthermore illustrated by the boldfaced verb form in (19), where focus is on the clefted pronoun *ty* ‘you’ (focus is marked by subscript F).

- (19) Anna otkrovenno brosila emu v lico obvinenie: éto ty_F ubival Anna openly threw.PF him in face accusation that you killed.IPF

⁶These roughly correspond to paduceva96's (paduceva96) existential/concrete general-factual vs. actional distinction.

ix, a ispol'zoval dlja étogo menja!

them and used.(i)PF for that me

'Anna openly accused him: It was you who killed them, and you used me
to achieve your goal'

(gronndiss)

The second sentence in (20) (forsyth70) is another case of the presuppositional imperfective, as discussed in gronndiss. The first sentence introduces the completed past event 'write my first love letter' with a perfective verb form (*napisal*). The second sentence is still about this very same event, picked up by the imperfective 'write'; the event, however, is backgrounded and the intonational focus is on the modifier *karandašom* 'with pencil'.

- (20) V étoj porternoj ja [...] napisal pervoe ljubovnoe pis'mo. Pisal
in this tavern I wrote.PF first love letter wrote.IPF
karandašom_F.
pencil.INSTR

'In this tavern, I wrote my first love letter. I wrote it with a pencil.'

gronndiss assumes that at the VP level this information structure leads to a background–focus division (krifka01). Backgrounded material is argued to be transformed into a presupposition, following The Background/Presupposition Rule in geurtssandt97. gronndiss's DRT formalization of the semantics of the VP in this second sentence in (20), after application of the Background/Presupposition Rule, is given in (21) (gronndiss).⁷

- (21) $\llbracket \text{VP} \rrbracket = \lambda e[x | \text{INSTRUMENT}(e, x), \text{PENCIL}(x)] [| \text{WRITE}(e)]$

The subscripted part of (21) is argued to introduce presupposed content into the DRS: the writing event is in the background and thus presupposed, whereas 'with

⁷Instead of the probably more familiar box notation for DRSs, gronndiss employs a linear simplified notation: To the left of | are the discourse referents one normally finds at the top of a DRS box (x in (21)) and to the right of it are the conditions on such discourse referents, separated by commata (gronndiss).

The VP in (21) is further embedded under AspP. gronndiss argues for an underspecified meaning of the imperfective, with the event time overlapping the reference time (klein95). He assumes that this meaning can be strengthened, in the right context, to the kind of perfective meaning we get with factual IPFs. In a more recent paper, gronn15 refrains from giving the Russian IPF a uniform denotation, and factual IPFs are argued to have the same denotation as PFs (the event time is included in the reference time). For the full formalization of this example, which also takes into account the contribution of Aspect, Tense and the overall discourse, see op.cit.

pencil' is in focus and part of the assertoric content. According to gronndiss, "the verbal predicate has an eventive argument, an instantiation of which is presupposed, i.e. given (more or less entailed) in the input context". Presuppositions are treated as anaphora, which can be bound to an antecedent, e.g. the perfective *napisal* in the first sentence in (20), or justified by the input context, as in (22).

- (22) Dlja bol'sinstva znakomyx vaš [ot"ezd]_(pseudo-)antecedent stal_{PF} polnoj neožidannost'ju...Vy [uezžali_{IPF}] anaphora v Ameriku [ot čego-to, k čemu-to ili že prosto voznamerilis' PF spokojno provesti_{PF} tam budučuju starost']_F?
 'For most of your friends your departure to America came as a total surprise ... Did you leave for America for a particular reason or with a certain goal, or did you simply decide to spend your retirement calmly over there?'
 (gronndiss)

The nominalization *vaš ot"ezd* 'your departure' (lit. 'off-drival') in the first sentence of (22) introduces a (one-time, completed) departure event by the addressee. This event is picked up again by the imperfective verb form *uezžali* 'away-drove' (lit.), which contains a semantically related prefix and the same verbal root ('drive'). In this second sentence, the departure event is backgrounded with respect to the focused elements that inquire about the reason or purpose of the departure.

Returning to imperfective PPPs, a crucial indication that they express a (sub-type of the) general-factual imperfective meaning is the following. Recall from the beginning of §2.3.1 that it holds for the general-factual meaning more generally that (in most cases) both imperfective and perfective word forms can be used, with only subtle meaning differences. When we compare our imperfective participles with their perfective variants (in those cases where a perfective option exists), we get the same effect. This is true of both verbal and adjectival participles, hence we classify them as factual imperfectives. (23) illustrates this for some of the examples in (14) and (15) (other examples that we identified as presuppositional imperfectives behave similarly).

- (23) a. (Na)pisano éto bylo Dostoevskim v 1871 godu [...]
 (PF)written.IPF that was Dostoevskij.INSTR in 1871 year
 'That was written by Dostoevskij in 1871.'
 b. (Po)kryt byl dom solomoj [...]
 (PF)covered was house hay.INSTR
 'The house was covered with hay.'

- c. My oba byli (po)striženy nagolo [...]
we both were (PF)haircut.IPF bald
'We were both shorn / we both had shaven heads.'

The meaning differences between imperfective and perfective participles are, as expected, very fuzzy and difficult to describe, since in all these cases we have one-time, completed events or states located in the past.

In the following, we will first briefly describe existential imperfective PPPs, although an account of this class is left for future research. Then we zoom in on the presuppositional ones and their analysis.

2.3.2 Existential imperfective past passive participles

Typical imperfectivity-inducing contexts discussed in the literature include negation, repetition, and habituality. Some of the contexts in which we found imperfective participles could, in principle, be described as such. For example, (24) illustrates negated or negative events.

- (24) a. [...] i ja uže ne byl zvan v gosti [...]
and I already not was called.IPF in guests
'And I was not invited anymore.'
- b. Mojka byla perepolnena nemytoj posudoj. Ne
sink was overflowed.PF unwashed.INSTR dishes.INSTR not
myto bylo davno.
washed.IPF was long-time
'The sink was overflowing with unwashed dishes. The dishes had not been done in a long time.'

The following examples involve event repetition (in the broadest sense), evidenced by pluractional markers (25) or markers of repeatability/iterativity (26) (in boldface).

- (25) Vsego nagljadelsja – i golodal, i syt **byval** po gorlo, i
all.GEN saw.IPF and starved.IPF and full was.FREQ until throat and
bit byl, i sam bil [...]
beaten.IPF was and self beat.PST.IPF
'[I] experienced it all – I starved, and I was full to the top, I was beaten, and I did the beating myself.'

- (26) a. **Ne raz** ja byl učen, molču i znaju [...]
 not once I was educated.IPF silent.1SG and know.1SG
 ‘Not just once was I lectured, I remain silent and know ...’
- b. Za čto **neodnokratno** byla bita [...]
 for what not-once was beaten.IPF
 ‘For what she was beaten more than once.’

We propose that all these contexts have the informal characteristics of existential imperfectives, outlined in the previous section. In particular, they state that ‘there were no events of that type (at some point in time or other)’ (for the negated examples) and ‘there were events of that type (at some point in time or other)’ (for the other examples). We conjecture that among our previous examples, also (8) (negation) and (9) (event repetition) contain existential imperfectives, but we will leave this for further research. The main focus of this paper are presuppositional imperfective PPPs, to which we turn now.

2.3.3 Presuppositional imperfective past passive participles

We argue that a prominent subset of the imperfective PPPs we found should be analyzed as presuppositional imperfectives, because they display hallmark properties of presuppositional imperfectives: Intonational focus is never on the verb but on some other element in the sentence, and a completed event is backgrounded and presupposed. In focus we find modifiers specifying the manner, quality, purpose or other aspect of the event itself (and not its culmination).⁸ In fact, removing the modifiers sufficiently decreases the acceptance of these examples, though it might be possible to leave them out in the right context. Relevant examples are given in (27).

- (27) a. Stroeno bylo éto [ploxo, xromo, ščeljasto]_F.
 built.IPF was that badly lamely with.holes
 ‘It was built badly, lamely, with holes.’
- b. Zapiski byli pisany ne dlja pečati_F [... no...]
 notes were written.IPF not for print but
 ‘The notes were written not for print, but ...’

⁸An anonymous reviewer pointed out that our corpus only contains written texts so that we cannot know where focus is in these sentences. We are reporting here the native Russian intuitions of the first author of this paper.

The kind of background–focus division typical for presuppositional imperfectives, as described in the previous subsection, is thus also found in our examples. This information structure is frequently accompanied by a marked word order that has the participle (i.e. the backgrounded material) in sentence-initial topic position and the modifier (i.e. the focused material) at the end, after BE, or in some other prominent position, see (28a). This word order is marked with respect to the unmarked order of the participle following BE, which is otherwise much more frequent (recall our context count in the beginning of §2). More such examples are given in (28).

- (28) a. [...] ne skazal, čto vagon-to naš učebnikami_F gružen byl?
not said.PF that waggon-PTL our textbooks.INSTR loaded.IPF was
'He did not tell us that our waggon was loaded with textbooks?'
- b. Znamenityj pokojnik nesen byl do mogily
Famous deceased.NOM carried.IPF was until grave
[na rukax]_F [...]
on arms
'The famous deceased was carried in arms until the grave.'

We also find this word order in examples already discussed, namely (7), (14a)–(14c), (15a), and (27a), which, we argue, also involve presuppositional imperfectives, evidenced by the focussed additional modifiers. However, this marked word order is not obligatory for presuppositional imperfective participles, as we see in (27b); what is relevant is the background–focus division described above. Finally, this marked word order is also found not only with presuppositional imperfectives. For example, in (25), which was argued to involve an existential imperfective, we find the same marked word order. This example is crucially different from the presuppositional imperfectives discussed here, though, in that there is no modifier in focus and instead the intonational focus is on the predicate.

3 The semantics of presuppositional imperfective past passive participles

We propose to extend gronndiss's (gronndiss) account of presuppositional imperfectives, which originally only covered active cases and which was illustrated

in (21), to passives.⁹ For example, the analysis of the VP in (27a), repeated as (29), is given in (30).

- (29) Stroeno bylo éto ploxo, xromo, ščeljasto.
 built.IPF was that badly lamely with.holes
 'It was built badly, lamely, with holes.'

- (30) $\llbracket \text{VP} \rrbracket = \lambda e [\mid \text{BAD}(e), \text{LAME}(e), \text{WITH HOLES}(e)] [\mid \text{BUILD}(e)]$

Under this analysis, the completion/culmination of the event is not part of the asserted meaning, and the imperfective shifts the focus to another aspect of the event, expressed by the modifier, instead of the culmination of the event itself.

The presuppositional account makes a number of predictions. One is that presuppositions project, in the sense that, e.g., negation affects only the asserted but not the presuppositional content. Thus, if the existence of a completed event is presupposed in the positive counterpart, as illustrated in (27), the same holds in a corresponding negated sentence in (31).

- (31) a. Stroeno éto ne bylo ploxo, xromo, ščeljasto.
 built.IPF that not was badly lamely with.holes
 'It was not built badly, lamely, with holes.'
 b. Zapiski ne byli pisany ne dlja pečati [... no ...]
 notes not were written.IPF not for print but
 'It is not the case that the notes were written not for print, but ...'

From both the original and the negated examples we infer the existence of a (completed) event, and what is negated in (31) is only the contribution of the modifier.¹⁰

Furthermore, if our imperfective PPPs are indeed presuppositional, the presupposed events should be bound to a perfective in the context or justifiable by

⁹Note that gronndiss acknowledges that factual IPFs are not restricted to past tense contexts but that he only concentrated on such contexts for convenience. In gronn15 he briefly mentions other IPF forms that could be analyzed along the same line, including, e.g., past active participles like *čitavšij* 'having read'. Our contribution in this respect is that we broaden the empirical coverage to include the passive data that has previously gone unnoticed, due to the (we hope to have shown) erroneous assumption that IPF PPPs do not deserve a proper compositional analysis.

¹⁰The negated examples in (31) (in particular (31b) with the double negation) sound somewhat unnatural, due to the fact that sentential negation usually negates the whole predicate, including the event. Nevertheless, to the extent that they are ok, they still imply event completion.

the input context, as we briefly discussed in §2.3.1. It is important to note at this point that many of Grønn's presuppositional imperfective examples in context do not pick up an identical perfective verb form, as in Grønn's (20), rather they seem to be merely 'justifiable in context', as in Grønn's (22). What does it mean, then, to be justifiable in context?

In the nominal domain, anaphora to previously introduced discourse referents can be expressed by pronouns or by definite descriptions. For example, in (32), the indefinite *a sister* in the first sentence introduces a new discourse referent. The second sentence shows that this discourse referent can be picked up by a pronoun, by a definite description with identical lexical material (*sister*), but also by a definite description that merely contains a related lexical noun, the hyperonym *girl*.

- (32) Bruno has a sister that lives in London. He loves {her / his sister / the girl} a lot.

Definite descriptions (but not pronouns) can also be used as bridging anaphora, such as *the window screen* in (33).

- (33) Carla was driving to work. The window screen was full of dead bugs.

In the verbal domain, pronominal (i.e. pro-verbal) anaphora do not really exist, apart maybe from the event kind anaphora *so/such*. Thus, presuppositional imperfectives have to be the event counterpart of definite descriptions. These pick up previously introduced event referents, either with identical lexical material or with a hyperonym or a hyponym. Alternatively, they are "justifiable by the context", which we then take to be parallel to bridging.

Do we find such anaphoric relations of our presuppositional imperfective participles in the broader contexts they appear in? Some examples showing that we do are given in (34).

- (34) a. čto kasaetjsa platy deneg, to plačeny byli
what concerns payment.GEN money.GEN then paid.IPF were
naličnymi šest' tysjač rublej [...]
in cash six thousand roubles
'As for the payment, six thousand roubles were paid in cash...' b. Ėto – ne ja sdelal, ēto – vedeno bylo moju rukoj!
this not I did.PF this led.IPF was my.INSTR hand.INSTR
'It wasn't me who did that, it was orchestrated by me (lit. led by my hand)'

Example (34a) is similar to Grønn's (22), in the sense that here the presuppositional imperfective participle *plačeny* 'paid' refers back to the event inside the related nominalization 'payment'. In (34b), the imperfective 'led' does not lexically repeat the perfective 'did'; nevertheless, we argue that semantically this is a subtype of doing event and thus a hyponym, so that we are again dealing with an anaphoric relation.

Finally, let us say a bit more about examples like (35) (and similarly (14a), (14b), (27b)).

- (35) Pis'ma ego pisany byli černo i kruglo [...]
 letters his written.IPF were black and round
 'His letters were written in black and round letters.'

We suggest that in (35), the created object *pis'ma* 'letters' can serve as anaphor for the writing event. In this case, *pis'ma* also happens to be morphologically related to *pisat'* 'write' (similarly *za-pis-ki* 'notes' in (27b)), though this is obviously not a general requirement, see (14a) and (14b).

A future task will be to check the contexts more thoroughly and systematically to see which of our imperfective PPPs really involve presupposed events, and furthermore to provide an analysis of other occurrences of such participles that do not lend themselves to an analysis in terms of presuppositional imperfectives. As we hypothesized in §2.3, they might very well turn out to all be instances of the existential meaning of the imperfective aspect, but this will have to be confirmed in further research.

4 Conclusion and open issues

In this paper we have shown, based on naturally occurring data, that there are fully compositional imperfective past passive participles in Russian, which occur in regular periphrastic passives (both adjectival and verbal). We therefore refuted the widespread assumption that such participles are non-compositional and should rather be analyzed as adjectives. We have shown that a representative subset of these participles come with a special information structure in which the verb is not accentuated but focus lies on a quasi obligatory modifier; this often comes with a marked word order in which the participle appears in sentence-initial position or at least in a position before BE, and the modifier in focus after BE. We implemented these findings in an account of such participles as involving the presuppositional imperfective aspect, where the event (completion) is presupposed and thus backgrounded, signalled by the use of the imperfective.

Several issues remain. First, if the empirical finding reported in §2 is indeed correct, **why are there no (contemporary) secondary imperfective past passive participles?** According to gronndiss, there are no morphological or lexical restrictions on factual imperfectives, so that both simple as well as secondary imperfectives should be possible. An impressionistic view in the literature, however (see also discussion in gronndiss, ch. 4), is illustrated by the following quote from comrie76: “The use of the Imperfective as a general-factual is particularly common with non-prefixed verbs, and rather less common with Imperfective verbs that owe their imperfectivity to a suffix that derives them from a Perfective.” At this point we can only speculate that presuppositional imperfectives are most common with simple imperfectives because these verb forms are morphologically the least marked for grammatical or lexical aspect, and presuppositional imperfectives generally do not focus on any aspectual meaning in particular. This line of argumentation, however, would not necessarily extend to existential imperfective participles. Another possibility could be that factual imperfectives historically first arose with a core group of imperfectives (which are all simple) and then spread to others; since imperfective PPPs are already quite restricted, maybe only the core verbs are affected. Yet another option could be that there is a real grammatical/morphological restriction on secondary imperfective PPP formation in Modern Russian (as opposed to earlier stages, as evidenced by our data), though we do not really know why that would be.

A further open issue is **why we do not find more cases of imperfective past passive participles**, i.e. why the number is so low, and why we find them more frequently only with a handful of verbs, as tentatively suggested in §2. The impression that many verbs of creation appear in this context could be due to the fact that we can infer the event already from the objects themselves, as alluded to at the end of §3. In addition, we have the intuition that passives are generally not that widely used in Russian, though we do not have statistical data to back this up. A potential (informal) explanation for this could be that in languages with a fixed word order, such as English, passives take on particular information structural functions that languages with a freer word order, such as Russian, can express in active sentences with different word orders. This, then, could lead to a more restricted use of the passive, so that it is only limited to aspectual/event structural functions (see abraham06 for argumentation along these lines). Another restricting factor which is suggested by our analysis comes from the specific licensing requirements for the presuppositional imperfective passives: if the anaphoric treatment of the presuppositional meaning is correct, these passives can only appear in contexts which can provide a discourse antecedent for the

passive sentence.

Finally, there is the issue of **cross-Slavic variation in the expression of passives**. From a cross-Slavic perspective, the aspectual restrictions on the formation of PPPs reported for Russian but partially refuted in this paper, is rather surprising. If we look at Czech, for example, PPPs can be derived from both imperfective and perfective verbs, across the board, and without the limited productivity of imperfective ones that we clearly find in Russian. Furthermore, such participles express verbal or adjectival passives, including passive “events in process” when we are dealing with imperfective ones (Radek Šimík, p.c.).¹¹ We can think of several possible research questions to be explored in this domain. One could be that languages with “fully productive” imperfective and perfective PPPs (e.g. Czech) form regular periphrastic verbal passives with all imperfective and perfective meanings. For languages like Russian, then, two options are conceivable. According to the first, combinations of BE with PPPs are adjectival, and only reflexive passives are verbal. Given the availability of event token modification (recall §2.2), we find this option less convincing. The second option is that combinations of BE and past participles are either verbal or adjectival, but can only express result states (*kratzer00’s kratzer00 TARGET STATES*). Reflexive passives, then, which are always verbal, fill the gap, for verbs that do not have target states, as well as for passive event-in-process readings. Under this hypothesis, though, it is still unclear why the Russian periphrastic passive cannot have a process meaning, especially in the cases of verbal/eventive passives. However, there is a split in “imperfective meanings” conveyed by different passives, in the sense that the process meaning is only conveyed by reflexive passives but other, sometimes called “peripheral” imperfective meanings, specifically habituality/iterativity and (all types of) factivity, are expressed by periphrastic passives (and then usually with perfective participles). What seems to be needed to explain this distribution is a competition-based analysis, possibly launched in an optimality theoretic framework.

¹¹Similarly, there are cross-Slavic differences in the properties of reflexive passives, which should also be taken into account; see **fehrmann+10** and **schaefner16** for further discussion.

Abbreviations

ACC	accusative	NOM	nominative
AOR	aorist	PF	perfective
DAT	dative	PL	plural
F	focus	PPP	past passive participle
GEN	genitive	PST	past tense
INSTR	instrumental	PTL	particle
IPF	imperfective	RFL	reflexive
FREQ	frequentative	RNC	Russian National Corpus
MOD	modal	SI	secondary imperfective

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Chapter 4

Event and degree numerals: Evidence from Czech

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In this paper, we bring in novel data concerning the distribution and semantic properties of two classes of adverbs of quantification in Czech, i.e., event numerals such as *dvakrát* ‘twice/two times’ as opposed to degree numerals such as *dvojnásobně* ‘doubly/twofold’. We explore the contrasts between the expressions in question including the interaction with comparatives and equatives as well as scope asymmetries. We propose that degree numerals target values on a provided scale and are, hence, best analyzed as predicates of degrees whereas event numerals have a more general semantics which primarily allows for quantification over individualized events, but also enables to operate on degrees.

Keywords: numerals, comparative, equative, degrees, scales, events, Czech

1 Introduction

Lexicons of many natural languages distinguish between two types of expressions involving quantification which correspond to English adverbs such as *twice* and *doubly*, see (1). Surprisingly, though cardinal numerals have received a lot of attention in the semantic literature on quantification ([landman2004indefinites](#), [ionin_composition_2006](#), [hofweber2005number](#), and [rothstein2012numericals](#) among many others), expressions such as those in (1) remain strikingly understudied both from a descriptive and theoretical perspective (with notable exceptions).

tions of *landman_indefinite_2006*, *bhatt2007degree*, and *donazzan_ways_2013*).¹

- | | | | |
|-----|----|----------------------|--------------|
| (1) | a. | twice/doubly | (English) |
| | b. | deux fois/doublement | (French) |
| | c. | dvaždy/vdvojne | (Russian) |
| | d. | kétszer/kétszeresen | (Hungarian) |
| | e. | hai-lân/gáp-dôi | (Vietnamese) |

The aim of this paper is to present novel data concerning the distribution and semantic properties of such expressions in Czech, exemplified in the text by (2). In recent years the meaning of different types of Slavic derived numerals has attracted considerable attention (see *docekal2012atoms*; *docekal2013numerals* for Czech, *wągiel2014dwoje*; *wągiel2015sums* for Polish, and *khrizman2015cardinal* for Russian), and thus the analysis of the presented data regards a broader enterprise intended to examine numeral quantification from the perspective of morphologically complex languages.

- | | | | |
|-----|----|-----------------|---------|
| (2) | a. | dvakrát | (Czech) |
| | | twice/two.times | |
| | b. | dvojnásobně | (Czech) |
| | | doubly/twofold | |

In this paper, we will refer to Czech adverbs of quantification such as (2a) as EVENT NUMERALS (ENs), whereas expressions like (2b) will be called DEGREE NUMERALS (DNs). Our goal is primarily empirical, hence we will focus our attention on discussing novel data. More particularly, we will concentrate on constructions in which the degree argument is being manipulated, specifically on the interaction with comparatives and equatives. We claim that ENs are best analyzed as adverbs of quantification whose semantics is general enough to allow for counting distinctive events in terms of iteration as well as operations on degree intervals. On the other hand, DNs are in fact degree predicates which makes their distribution more restricted.

The article is outlined in the following way. In §2, we will discuss the distribution of Czech ENs and DNs based on the corpus study we have conducted. In §3, we will examine the key environments in which such expressions occur. In §4, we will focus on categorial and typal differences and we will bring in additional

¹*wągiel-toappear-entities* proposes an analysis of Slavic adjectival multipliers similar to English *double*, however, we are not aware of any semantic treatment of adverbial expressions corresponding to English *doubly*.

contrasts involving ENs and DNs whereas §5 will discuss the properties of adjectival and nominal DNs. §6 will summarize the data and in §7, we will propose a predicative semantics for DNs as well as suggest an analysis of ENs. §8 concludes the paper.

2 Distribution

At first blush, Czech numerals such as *dvakrát* ‘twice/two times’ and *dvojnásobně* ‘doubly/twofold’ appear to be synonymous in some contexts.

- (3) a. Petrovi se to vyplatio **dvakrát / dvojnásobně**.
for.Petr REFL this paid.off twice doubly
'For Petr it paid off twice.'
- b. Ceny tady jsou **dvakrát / dvojnásobně** vyšší než tam.
prices here are twice doubly higher than there
'The prices here are two times higher than there.'

However, a more careful investigation reveals that there are multiple environments in which they are not. In order to determine the distribution of ENs and DNs and to define the properties of the contexts in which they occur, we conducted a corpus study based on the Czech National Corpus (CNC).² The selected corpus samples contained 100 random occurrences of the EN *dvakrát* and the DN *dvojnásobně*, which were reduced to 98 and 99 occurrences, respectively, after filtering. Figures 1 and 2 present the preferred environments in which the numerals in question appear in the samples.

The results show a significant difference in the distribution of ENs and DNs that, in our opinion, unveils the real nature of these expressions. Whereas in 77% of occurrences, *dvakrát* targets event-denoting VPs as well as temporal AdvPs and PPs,³ *dvojnásobně* tends to modify comparatives, APs, and secondary predicates as well as degree-related VPs.⁴ In total, it targets scales in 90% of the studied cases.

²The CNC is a representative corpus of contemporary Czech. We have selected the SYN2015 sub-corpus (kren-etal2015), which is the largest reference corpus of contemporary written Czech consisting of more than 100 million tokens. We searched for the lemmas *dvakrát* and *dvojnásobně*.

³Following *doetjes_adverbs_2007*, we assume that adverbials such as *dvakrát denně* ‘twice a day’ and *dvakrát za týden* ‘twice a week’ are similar to frequency expressions in the sense that their interpretation is dependent on the time interval they introduce.

⁴Out of 30 VPs modified by *dvojnásobně* 9 were headed by deadjectival verbs, e.g., *zvětšit* ‘enlarge’ and *zvýšit* ‘raise’, whereas 11 involved predicates inherently associated with scales in-

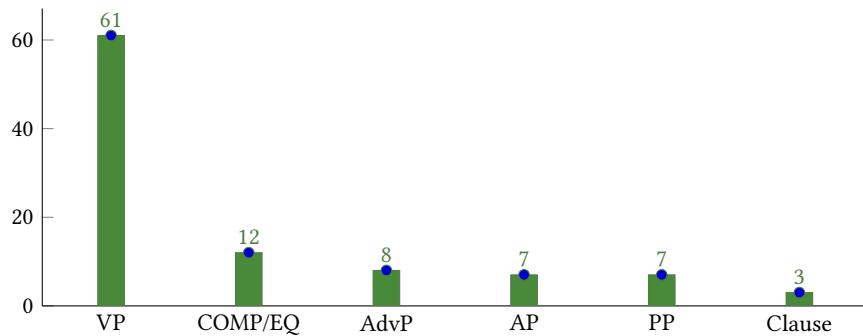


Figure 1: Distribution of *dvakrát*

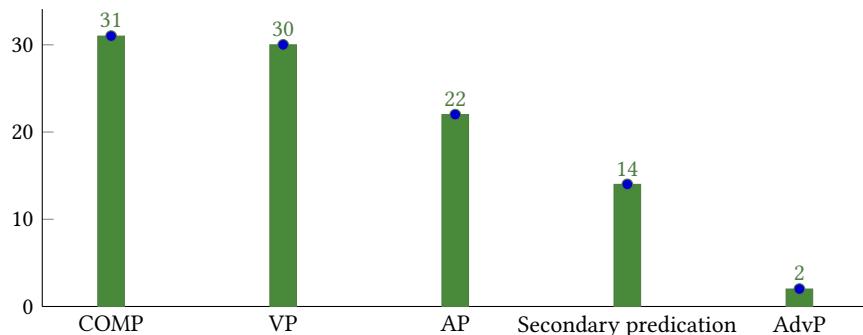


Figure 2: Distribution of *dvojnásobně*

The observed contrast suggests that *dvakrát* naturally favors event-denoting environments (though it can appear in comparatives and equatives) whereas *dvojnásobně* exhibits a very strong tendency to select for degree expressions.

In the following sections, we will examine two contexts we assume to be crucial for understanding the character of the EN/DN alternation as well as further contrasts and differences between those expressions.

cluding verbs operating on degrees such as *zvednout* and *vzrůst* ‘increase’. The remaining 10 examples involved predicates such as *platit* ‘pay’, *trestat* ‘punish’, and *jásat* ‘rejoice’ which arguably at least to some extent also pertain to the notion of gradability.

3 Key contexts

3.1 Degrees and differentials

The first environment to be discussed is constituted by degree constructions involving comparison. Both ENs and DNs can appear in comparatives as differentials, as attested by the examples from the CNC corpus in (4).

- (4) a. ... je dnes až **dvojnásobně** větší nebezpečí ničivých povodní
is today even doubly bigger danger destructive floods
než před 20 lety.
than before 20 years
'... today, the danger of destructive floods is two times bigger than 20 years ago.'
- b. ... a tak se dokážou **dvakrát** rychleji ohřát nebo zchladit
and thus REFL manage twice faster heat or cool.down
než běžné žehličky.
than ordinary irons
'... and thus they can heat or cool down two times faster than ordinary irons.'

Furthermore, both ENs and DNs are unacceptable in superlatives.⁵

- (5) *Petr je **dvakrát / dvojnásobně** nejvyšší.
Petr is twice doubly tallest

Nevertheless, an interesting contrast arises when we consider equatives. Though Czech ENs are perfectly fine in such an environment, see (6), DNs are significantly less acceptable in equatives than in comparatives, as witnessed by the oddity of (7b).⁶ In addition, there are no attested occurrences of equatives with DNs in CNC.

- (6) a. Petr je **dvakrát** vyšší než Marie.
Petr is twice taller than Marie
'Petr is two times taller than Marie.'

⁵ENs may appear as superlative modifiers, e.g., in the past tense. However, a sentence such as *Petr byl dvakrát nejvyšší* 'Petr was the tallest twice' has only an event reading which states that there were two occasions on which Petr was the tallest one among the compared individuals. Therefore, it seems that in such cases the EN modifies the whole phrase, i.e., the copula and the superlative, rather than the superlative alone.

⁶A similar contrast between *twice* and *two times* in English has been observed in gobeski2011twice.

- b. Petr je **dvakrát** tak vysoký jako Marie.
Petr is twice so tall how Marie
'Petr is twice as tall as Marie.'
- (7) a. Petr je **dvojnásobně** vyšší než Marie.
Petr is doubly taller than Marie
'Petr is two times taller than Marie.'
- b. * Petr je **dvojnásobně** tak vysoký jako Marie.
Petr is doubly so tall how Marie

This property of DNs corresponds to the behavior of standard differentials, which, as indicated in (8), although frequently attested in comparatives, are not possible in equatives.⁷

- (8) a. Petr je **o 10 cm** vyšší než Marie.
Petr is by 10 cm taller than Marie
'Petr is 10 cm taller than Marie.'
- b. * Petr je **o 10 cm** tak vysoký jako Marie.
Petr is by 10 cm so tall how Marie

These data seem to suggest that though both ENs and DNs can operate on scales, they differ in that they employ distinct strategies to modify the degree they target. On the basis of the presented evidence, we assume it is plausible to hypothesize that DNs share core semantic properties with differentials. On the other hand, the compatibility of ENs with equatives seems to imply that they are expressions of a very distinct type.

3.2 Count events

The second key environment to be discussed here involves VPs referring to individuated count events. Multiple examples attested in the CNC corroborate the well-known fact that ENs can combine with VPs in order to quantify over eventualities. Interestingly, as witnessed by the ungrammaticality of (9b), DNs cannot be used to count events.

⁷ As an anonymous reviewer points out it seems that (8b) is out because equatives need to apply the AP internally, before the degree variable *d* is bound, for instance by the POS operator (e.g., kennedy_mcenally2005scale).

- (9) a. **Dvakrát** se přesvědčím, že jsou dvířka zavřená. (CNC)
twice REFL I.will.ensure that are door closed
'I will make sure twice that the door is closed.'
- b. ***Dvojnásobně** se přesvědčím, že jsou dvířka zavřená.
doubly REFL I.will.ensure that are door closed

Not surprisingly, neither ENs nor DNs modify VPs denoting homogeneous eventualities such as static states, as demonstrated in (10). As expected, no such examples were found in the CNC samples.

- (10) * Petr **dvakrát / dvojnásobně** zná Marii.
Petr twice doubly knows Marie

Another observation concerns VPs referring to values on scales. While both ENs and DNs can modify verbs such as *vzrůst* ‘increase’, there is an asymmetry with respect to possible readings of sentences containing such phrases. Let us consider the contrast between (11b) from the CNC and the corresponding example in (11a). As indicated in the translation, (11a) is ambiguous between the quantified-degree and the quantified-event interpretation, i.e., it is either true of a scenario where the demand increased by two times irrespective of the number of times it increased, or of a situation where there were two events of increasing the demand, irrespective of the value by which the demand was increased. Crucially, (11b) lacks the quantified-event interpretation and can only be true of a scenario in which the degree of increase was multiplied by two.

- (11) a. Poptávka po dotacích vzrostla **dvakrát**.
demand after subsidies increased twice
‘The demand for subsidies increased twice / by two times.’
- b. Poptávka po dotacích vzrostla **dvojnásobně**. (CNC)
demand after subsidies increased doubly
‘The demand for subsidies increased doubly.’

The discussed observations further support the semantic nature of the EN/DN alternation. At this point, it seems innocuous to state that the distinction relies on the strategy the expressions in question make use of in terms of quantification. Whereas DNs are unable to count events and are restricted to operations on degrees, ENs seem to employ a more general semantics which allows for quantification over both events and degrees. Further differences will be examined in the next section.

4 More contrasts

4.1 Categorial differences

Another difference between Czech ENs and DNs concerns their derivational potential. Both classes involve morphologically complex expressions derived from a numeral root, e.g., *dv-* (corresponding to English *tw-*), by different suffixes, i.e., *-krát* and *-násobn-*.⁸ However, the contrast between (12) and (13) indicates an apparent categorial asymmetry. Unlike DNs, which employ distinct morphology to display a broad range of syntactic categories including adverbial, adjectival, and nominal forms (all derived from the same stem), ENs are defective in the sense that they have only adverbial forms and cannot appear in syntactic contexts which are sensitive for adjectives and nominals.⁹

(12)	<i>dvakrát</i>		(13)	<i>dvojnásob-</i>	
a.	pršelo dvakrát	Adv	a.	dvojnásobně dlouhý	Adv
	rained twice			doubly long	
	'it rained twice'			'two times longer'	
b.	* dvakrát(ní) objem	A	b.	dvojnásobný objem	A
	twice.A capacity			double capacity	
	'double the capacity'				
c.	* dvakrát(ek) rychlosti	N	c.	dvojnásobek ceny	N
	twice.N speed			double.N price	
	'double the price'				

Although the categorial asymmetry provided in (12) and (13) may suggest that ENs and DNs are exponents of distinct semantic objects, as such it is, of course, insufficient to draw a typal distinction between the two. In the next section, we will investigate such a possibility in more detail.

⁸In fact, *-násobn-* can be further decomposed at least to *-násob-*, as attested in *násobit* 'multiply', and *-n-*. For the sake of simplicity, we will ignore the morphological complexity here.

⁹It should be noted that the inability of ENs to take adjectival and nominal morphology seems to be a Czech idiosyncrasy since, for instance, Polish allows for forms such as *dwukrotny* 'twice.A' and *dwukrotność* 'twice.N'. Similar, there is adjectival *dvukratnyj* in Russian and *dvakratni* in Slovenian. However, a detailed cross-linguistic comparison of ENs and DNs is beyond the scope of this paper and constitutes a challenge for further research.

4.2 Typal compatibility

A further observation concerns the fact that ENs and DNs in Czech can be stacked, as witnessed by the grammaticality of examples such as (14a). This suggests that Czech expressions of those kinds are compatible in terms of their semantic types. Moreover, the reversed order of numerals, as provided in (14b), is not possible, which further suggests different input requirements.

- (14) a. Petrovi se to třikrát dvojnásobně vyplatilo.
 for.Petr REFL this thrice doubly paid.off
 ‘For Petr it paid off doubly three times.’
- b. * Petrovi se to dvojnásobně třikrát vyplatilo.
 for.Petr REFL this doubly thrice paid.off

Furthermore, there is solid evidence that unlike ENs, DNs are anchored to a particular event. Let us consider possible interpretations of a sentence such as (15) in which the conjoined NP in subject position denotes a plurality of entities whereas the modified VP refers to a plurality of events. As indicated in (15a) and (15b), the sentence can either have a distributive reading where the events of paying off doubly are distributed equally onto each of the individuals, i.e., Petr and Honza, or a collective reading in which it payed off doubly three times for Petr and Honza as a group. Moreover, a cumulative interpretation as in (15c) is also possible. In such a scenario there was a total of three events of paying off doubly and Petr and Honza share the total gain disproportionately. Nevertheless, (15) cannot have a meaning such as the one in (15d) or in (15e). It is impossible to understand the sentence in such a way that the total gain corresponds to six units, similar to (15b) or (15c), but the total number of events is less or greater than three. Such cumulations are simply unaccessible which implies that DNs cannot outscope the event quantifier and are forced to operate on degrees within a particular event.

- (15) Petrovi a Honzovi se to třikrát dvojnásobně vyplatilo.
 for.Petr and for.Honza REFL this thrice doubly paid.off
 ‘For Petr and Honza it paid off doubly three times.’
- for Petr: $3 \times (\text{it-paid-off} \times 2)$ + for Honza: $3 \times (\text{it-paid-off} \times 2)$
 - for Petr+Honza: $3 \times (\text{it-paid-off} \times 2)$
 - for Petr: $2 \times (\text{it-paid-off} \times 2)$ + for Honza: $1 \times (\text{it-paid-off} \times 2)$
 - * for Petr+Honza: $2 \times (\text{it-paid-off} \times 3)$
 - * for Petr: $4 \times (\text{it-paid-off} \times 1)$ + for Honza: $1 \times (\text{it-paid-off} \times 2)$

The data clearly demonstrate that adverbial ENs and DNs differ with respect to their semantic type and scopal properties. The following sections will explore some additional semantic phenomena related to adjectival and nominal forms of DNs.

5 Adjectival and nominal degree numerals

5.1 Quantification over amounts and values

Let us now consider Czech adjectival DNs such as *dvojnásobný* ‘double/two-time’. The CNC data confirm our intuition that such expressions often modify amount nominals and nouns implicitly associated with scales like those in (16).¹⁰ In those contexts, the DN appears to multiply a contextually provided value on a particular scale. As a result, the predicates in (16) are true of a twice as high volume and a twice as high salary, respectively.

- (16) a. dvojnásobný objem
double volume
‘double the volume’
b. dvojnásobný plat
double salary
‘double the salary’

Interestingly, adjectival DNs are not compatible with container nouns, as the contrast between (17a) and (17b) shows. This property differentiates them from basic cardinal numerals, since in order to quantify over amounts determined by container nominals Czech requires cardinals to do the job, see (17c). Czech cardinals, however, are unable to combine with amount nouns to count quantities, as witnessed by the ungrammaticality of (17d).

- (17) a. dvojnásobné množství čaje
double amount tea
‘double the amount of tea’
b. * dvojnásobný hrnek čaje
double cup tea

¹⁰In the CNC, among the 15 most frequent collocation candidates for the lemma *dvojnásobný* (1,567 occurrences in SYN2015) one can find the followings nouns: *počet* ‘number’, *množství* ‘amount’, *cena* ‘price’, and *rychlosť* ‘speed’.

- c. dva hrnky čaje
two cups tea
'two cups of tea'
- d. * dvě množství čaje
two amount tea

The data discussed above show that DNs and cardinals are in complementary distribution with respect to container and amount nouns. This fact suggests that the two types of expressions in question make use of distinct quantificational strategies and should be analyzed differently.

5.2 Events and social roles

Amount nouns do not exhaust the combinatorial potential of adjectival DNs since they can also modify two other classes of expressions, specifically nominals referring to events, as exemplified in (18a), as well as nominals denoting social functions such as, e.g., family roles and public capacities, see (18b).¹¹ Nevertheless, the interpretation of such phrases differs from the meaning of, e.g., (16), in which the DN seems to merely multiply the value indicated by the implicit degree argument of the amount nominal. For instance, (18a) refers to a set of murdering events involving two victims in each such an event, i.e., the DN seems to access an internal argument of the deverbal nominal. On the other hand, similar to what was observed in *wagiel2015multiplicative* examples such as (18b) denote a set of individuals that have gained a particular property two times – in this case, the property of becoming a champion.¹²

- (18)
- a. dvojnásobná vražda
double murder
'double murder'
 - b. dvojnásobný mistr
double champion
'two-time champion'

Further evidence that amount NPs and nominals implicitly associated with scales substantially differ from nominals denoting events or social roles modified by

¹¹The CNC collocation candidates list includes, among others, the following examples for the first class: *vražda* 'murder', *přesilovka* 'power play', and *radost* 'joy', as well as *vítěz* 'winner', *matka* 'mother', and *účastník* 'participant' for the latter.

¹²Notice that such behavior seems to be a Czech idiosyncrasy since many other languages make use of a different adjective to express such a meaning, e.g., see the English translation in (18b).

adjectival DNs comes from the distribution of nominal DNs such as *dvojnásobek* ‘double.N’. As demonstrated in (19), such nominalizations cannot take expressions referring to events or social roles as their complements though they frequently combine with amount nominals.¹³

- (19) a. dvojnásobek rychlosti
double.N speed
'double the speed'
b. * dvojnásobek vraždy / mistra
double.N murder champion

Moreover, the asymmetry is further supported by the contrast in (20). In such examples, *je* ‘is’ is not used as a copula of predication, but rather it seems to establish the identity relation between the denotation of its complement and that of the subject NP.¹⁴ In (20a), the definiendum, i.e., the modified degree noun, is associated with the definiens comprising the comparative construction. On the other hand, (20b) and (20c) are odd since neither *mistr* ‘champion’, nor *sebevražda* ‘suicide’ provides a degree argument to be accessed by the DN, and thus the subject NPs are not equivalent to the corresponding comparatives. In other words, since the subjects and the nominals within the matrix predicates in (20b) and (20c) refer to different entities, establishing the identity relation is impossible.¹⁵

- (20) a. Dvojnásobná rychlosť je dvakrát väčšia rychlosť.
double speed is twice bigger speed
'Double the speed means two times higher speed.'
b. # Dvojnásobný mistr je dvakrát väčší mistr.
double champion is twice bigger champion
c. # Dvojnásobná sebevražda je dvakrát väčšia sebevražda.
double suicide is twice bigger suicide

The contrasts described above indicate that adjectival and nominal DNs display heterogeneous behavior in interaction with NPs implicitly associated with scales

¹³For instance, the CNC lists the following among the 15 most frequent collocation candidates for the lemma *dvojnásobek* (845 hits in SYN2015): *cena* ‘price’, *čästka* ‘sum of money’, *počet* ‘number’, and *velikost* ‘quantity’.

¹⁴Note that (20a) is ungrammatical with the instrumental *rychlosť* ‘speed.INS’, which is commonly associated with predication.

¹⁵This property seems to resemble some sort of a monotonicity constraint, as discussed in schwarzschild2002grammar. However, the exact nature of this phenomenon requires further investigation.

on the one hand and with event and social role nominals on the other. Possibly, the relationship between the two types of phrases is much less straightforward than it might initially seem. In this paper, however, we are primarily concerned with examples such as (16a) and we assume that use of adjectival DNs to be the basic one.

5.3 Predicate position

Finally, the last observation concerns the attributive and predicative use of adjectival DNs. In all the examples provided in the previous sections, *dvojnásobný* appears as a nominal modifier which seems to be the most natural syntactic context for such an expression. Nevertheless, it is not unusual to find *dvojnásobný* in predicate position as well, as attested in an CNC sentence in (21). Here, the DN serves as the main predicate of a sentence and assigns a property to a subject denoting an amount, i.e., *hodnota* ‘value’. In particular, it is predicated of the value of saved property it is twice as high relative to the value corresponding to the damages, i.e., it amounts to 100 000 CZK.

- (21) ... škoda dosahuje asi 50 tisíc korun. Hodnota
 damage reaches approximately 50 thousand crowns value
 uchráněného majetku je **dvojnásobná**. (CNC)
 saved property is double
 ‘... the damages reach approximately 50 000 CZK. The value of saved
 property is twice as high.’

Sentences such as (21) are far less frequent in the CNC than examples with adjectival DNs in attributive position. However, we regard their existence as an important piece of evidence, supporting the predicative nature of DNs.

6 Data summary

Before we move on to the analysis of the EN/DN distinction, let us briefly recapitulate the empirical findings. Table 1 summarizes the observed contrasts.¹⁶ In brief, ENs are able to target both events and degrees. They have only adverbial forms and tend to appear in eventive environments though they can also modify degree constructions including comparatives and equatives. On the other hand, DNs cannot scope over events and they heavily favor scalar contexts excluding

¹⁶The most frequent environments based on the CNC corpus study are in bold.

Table 1: Properties of event and degree numerals

Property	Event numerals	Degree numerals
Morphology	Adv	Adv/A/N
Degree	yes	yes
Differential in comparatives	yes	yes
Differential in superlatives	no	no
Differential in equatives	yes	no
Modify count events	yes	no
Modify degree events	yes	yes
Events (N)	no	yes
Roles (N)	no	yes

equatives. Not only can they take adverbial and nominal, but also adjectival morphology and as such they can quantify over amounts, arguments of events, as well as time intervals associated with social roles specified by nominals they modify. In the next sections, we attempt to account for at least some of the puzzling differences between the two classes of expressions in question. We will propose an analysis of adverbial DNs and suggest possible directions of development to account for the meaning of ENs as well as adjectival DNs.

7 Proposal

7.1 Degree numerals

On the basis of the distributional evidence, we argue that the comparative examples introduced in §3.1 reveal the true nature of DNs. Let us now consider more closely the example in (7a), repeated here as (22). The truth conditions of the sentence are specified informally in (22a) and (22b) gives an exemplary situation in which the sentence would be true.

- (22) Petr je dvojnásobně vyšší než Marie.
 Petr is doubly higher than Marie
 ‘Petr is two times taller than Marie.’
- a. True in all situations where the height of Petr is equal to the height of Marie multiplied by 2
 - b. $\mu_{\text{HEIGHT}}(\text{PETR}) = 180 \wedge \mu_{\text{HEIGHT}}(\text{MARIE}) = 90$

Building on the observations discussed in §3.1, we acknowledge that DNs seem to behave similarly to differentials in that they define the difference between compared values on a scale provided by the comparative. Nonetheless, we argue that the underlying mechanism which yields such a result is distinct. DNs differ from typical differentials in that they do not determine the gap in terms of some absolute value, e.g., 10 cm as in (8a). Instead, they provide information about the degree corresponding to a correlate in terms of the value related to a standard of comparison. For instance, in (22) the DN specifies the height of the correlate, i.e., Petr, in terms of the multiplied height of the standard of comparison, i.e., Marie.

We are now ready for the first approximation. Based on the observation discussed in §5.3, namely that *dvojnásobný* can occur in predicate position, see (21), we propose that the primary interpretation DNs have is the predicative one. Furthermore, based on the morphological evidence examined in §4.1, we assume that Czech DNs are compositional. We posit that numeral roots simply refer to numbers modeled as abstract entities and as such are expressions of type n . On the other hand, the suffix *-násobn-* introduces an operation involving multiplication of a degree by a number denoted by the root. Therefore, we model DNs as degree predicates, i.e., expressions denoting a characteristic function of degrees (type $\langle d, t \rangle$). We posit that such a function yields the truth value True iff a selected degree d is two times higher than some contextually determined value g . The semantics for *dvojnásobný* is proposed in (23a) whereas (23b) gives the abstracted meaning of DNs in general.

- | | | |
|------|--|--|
| (23) | a. $\llbracket \text{dvojnásobně} \rrbracket = \lambda d[d = 2 \times g]$ | type $\langle d, t \rangle$ |
| | b. $\llbracket \text{Degree Numeral} \rrbracket = \lambda n \lambda d[d = n \times g]$ | type $\langle n, \langle d, t \rangle \rangle$ |

Let us now consider how (23a) accounts for the meaning of (21). The denotation of the subject NP (an expression of type d), i.e., the value of saved property, has the property of being equal to the value corresponding to the damages multiplied by two. The logical type of the DN is $\langle d, t \rangle$, hence the composition of (21) proceeds via the standard rule of Function Application. The predicate of degrees is applied to the degree denoting subject (type d) and after the degree variable is saturated a truth value is obtained.

7.1.1 Comparatives

Before we demonstrate how the proposed semantics fits into the big picture involving comparatives and equatives, let us introduce several assumptions concerning gradability and comparison. First of all, we adopt the standard view

and assume an ontology including degrees, i.e., objects of a primitive type d , which are ordered into scales. A scale is modeled as a triple $\langle D, >, \text{DIM} \rangle$ where D is a set of degrees, $>$ is an ordering relation on D , and DIM represents a dimension of measurement such as height or weight. Notice, however, that we embrace the interval-based approach to degrees (e.g., `kennedy2001polar` and `schwarzschild_wilkinson2002quantifiers`).

Second, following `solt2015q-adjectives` we assume that individuals are associated with scales via measure functions that map an entity to the unique degree on the scale corresponding to the particular dimension. For instance, the measure function μ_{HEIGHT} yields the measure of an individual with respect to the dimension of height. Thus, the semantics of a gradable adjective such as *tall* looks like (24).

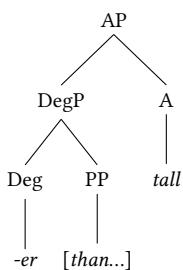
$$(24) \quad [\![\text{tall}]\!] = \lambda d \lambda x [\mu_{\text{HEIGHT}}(x) \geq d]$$

However, we slightly diverge from the standard semantics for comparatives (e.g., `von_stechow_comparing_1984`, `heim_degree_2000`, and `schwarzschild_semantics_2008`) in that we model the comparative marker in constructions such as (22) as involving the \geq (rather than $>$) relation between maximal degrees corresponding to compared entities on a provided scale, as in (25) (a similar treatment of *-er* in English percentage differential comparatives was assumed by `gobeski_morzycki2017percentages`). What is important is that the \geq relation may be pragmatically strengthened to $=$ unless a suitable context prevents strengthening. We will discuss this issue in more detail below.

$$(25) \quad [\![-\text{er}_x]\!] = \lambda D' \lambda D [\text{MAX}(D) \geq \text{MAX}(D')] \quad \text{type } \langle\langle d, t \rangle, \langle\langle d, t \rangle, t \rangle\rangle$$

Furthermore, we assume the standard syntactic analysis of comparatives. In particular, we adopt the so-called small DegP view on which the comparative marker *-er* and the than-clause form a constituent at LF and the entire DegP serves as an argument of the gradable predicate (e.g., `heim_degree_2000`), as illustrated in (26).

(26)



Finally, following **pancheva2006phrasal** we assume that Slavic comparatives such as (22) involve an elided clause introducing the maximal interval corresponding to a standard of comparison on a proper scale. Within such an approach, Czech clausal comparatives like (27a) are analyzed as in (27b).

- (27) a. Petr je vyšší než Marie.
 Petr is taller than Marie
 ‘Petr is taller than Marie.’
 b. LF: [_{IP} [_{IP} Petr is d_1 -tall] [_{DegP} -er₁ [_{PP} than [_{CP} Marie is d -tall]]]]]

In the assumed structure, the comparative morpheme is interpreted as a quantifier over degrees, i.e., it takes a set of degrees and returns a function from a set of degrees to a truth value (type $\langle\langle d, t \rangle, \langle\langle d, t \rangle, t \rangle\rangle$). As discussed in detail in **pancheva2006phrasal**, such typing is incompatible with the denotation of the than-clause since as a free relative it is interpreted as a definite description, i.e., a degree denoting expression of type d (**heim_degree_2000**). To remedy such a type clash, some approaches (e.g., **von_stechow_comparing_1984** and **rullmann1995maximality**) attribute a non-trivial semantics to *than*.¹⁷ We follow this line of analysis. In particular, we adopt **pancheva2006phrasal**’s (**pancheva2006phrasal**) treatment of *than* as a partitive preposition in the domain of degrees which in clausal comparatives gets the semantics in (28).

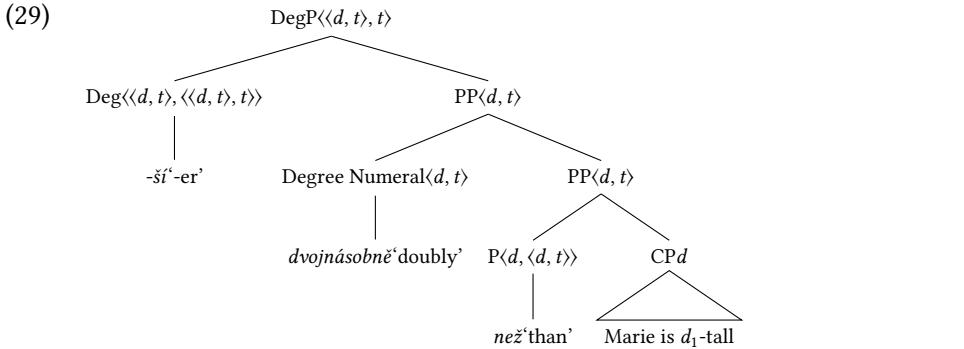
$$(28) \quad [\text{than}] = \lambda d' \lambda d [d \text{ is part of } d'] \quad \text{type } \langle d, \langle d, t \rangle \rangle$$

In prose, *than* takes a denotation of a free relative clause, i.e., a degree d , and yields a set of degrees which d is member of. For instance, if the standard of comparison in (27a), i.e., Marie, corresponded to, e.g., 170 cm, then the entire than-clause would denote a set of degrees in the interval between 0 and 170 on the scale of height calibrated in centimeters. In terms of semantic types, the result of *than* being applied to the standard of comparison is an expression of type $\langle d, t \rangle$ which can serve as the first argument of the comparative morpheme. We assume that the same mechanism applies to the Czech preposition *než* ‘than’.

With all the ingredients in place, let us now consider how the pieces fit together. Assuming that **heim_kratzer1998semantics**’s (**heim_kratzer1998semantics**) rule of Predicate Modification applies also to degree predicates, the adopted analysis creates a plausible attachment site for DNs. Since they are expressions of

¹⁷This contrasts with the standard view assuming that *than* is semantically vacuous (e.g., **heim_degree_2000**, **kennedy2001polar**, and **schwarzschild_wilkinson2002quantifiers**).

type $\langle d, t \rangle$, we propose that they can modify the PP node resulting in a syntactically more complex argument for Deg, as illustrated in the tree in (29). Crucially, the derived expression is also of type $\langle d, t \rangle$ which is suitable for the interpretation by the comparative morpheme.



The composition proceeds as follows. The preposition *než* takes the maximal interval to which Marie is tall as its input and yields a set of degrees which are part of that interval. Subsequently, the DN combines with the PP via Predicate Modification, and thus multiplies each member of the set by two. The output is a set of intervals that are two times bigger than the intervals corresponding to Marie's height and can serve as the first argument of the comparative morpheme -ši'. The comparative morpheme applies the maximization operation MAX which picks the degree, i.e., the maximal interval, to which Marie is tall multiplied by two. As a result, the whole sentence is true iff the degree on a scale of height corresponding to the correlate, i.e., Petr, is equal or exceeds the value corresponding to Marie, as stated in the truth-conditions in (30a). However, this is not the way one would normally understand a sentence such as (22). In order to account for that deficiency, we propose that (30a) gets strengthened to (30b), i.e., the \geq relation is replaced by $=$, which finally gives rise to an expedient result. We assume that the pragmatic enrichment results from a scalar implicature, a consequence of the competition between *dvojnásobně* and higher DNs similar to what has been proposed in the neo-Gricean theories of cardinals (e.g., horn1972semantic).

- (30) [[(22)]] =
- $\text{MAX}(\lambda d[\mu_{\text{HEIGHT}}(\text{PETR}) \geq d]) \geq \text{MAX}(\lambda d'[d' = 2 \times \mu_{\text{HEIGHT}}(\text{MARIE})])$
 - $\rightsquigarrow \text{MAX}(\lambda d[\mu_{\text{HEIGHT}}(\text{PETR}) \geq d]) = \text{MAX}(\lambda d'[d' = 2 \times \mu_{\text{HEIGHT}}(\text{MARIE})])$

On the other hand, in a sentence such as (31a) where *aspoň* 'at least' prevents from the pragmatic inference the unstrengthened meaning unearths and we obtain the

at least interpretation given in (30a). The lack of pragmatic enrichment in such examples is parallel to well-studied cases like *more than three boys* where the modified numeral never gives rise to a scalar implicature (see, e.g., krifka_at_1999 and schulz_pragmatic_2006). Another observation concerns the disappearance of scalar implicatures in downward-entailing contexts, as in (31b). Unlike (22), (31b) does not suggest that Petr's height cannot correspond to Marie's height multiplied by three or more. We regard it as an argument in favor of the competition account resulting in the strengthening of (30a) to (30b).

- (31) a. Petr je aspoň dvojnásobně vyšší než Marie.
Petr is at.least doubly taller than Marie
'Petr is at least two times taller than Marie.'
- b. Petr není dvojnásobně vyšší než Marie.
Petr isn't doubly taller than Marie
'Petr is not two times taller than Marie.'

The developed account seems to deliver desirable results. Not only have we provided an explanation of the semantic composition of DNs within the structure of the DegP but also we have proposed a plausible analysis of how comparatives modified by DNs are being interpreted.

7.1.2 Equatives

So far we have demonstrated how our proposal accounts for the interaction between DNs and comparatives. Let us now turn to one of the main puzzles of the paper, namely the incompatibility of DNs with equatives, as witnessed by the ungrammaticality of (7b) repeated here as (32).

- (32) * Petr je dvojnásobně tak vysoký jako Marie.
Petr is doubly so tall how Marie

We assume that similar to comparatives equative sentences involve a CP with elided material. Unlike comparatives, however, equatives lack an element such as *than* which would shift the type of a free relative of degrees to $\langle d, t \rangle$. Therefore, at LF an equative sentence such as (33a) gets the structure in (33b) where the DegP takes the CP as its argument directly (see gobeski_morzycki2017percentages for a similar analysis of equatives).

- (33) a. Petr je tak vysoký jako Marie.
Petr is so tall how Marie
'Petr is as tall as Marie.'

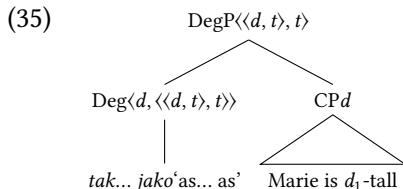
- b. LF: $[\text{IP} [\text{IP} \text{ Petr is } d_1\text{-tall}] [\text{DegP as... as}_1 [\text{CP} \text{ Marie is } d\text{-tall}]]]$

Additional evidence suggesting that the proposed analysis is on the right track comes from the morpho-syntax of Slavic equatives. In Czech, the equative contains only the wh-element *jako* ‘how’ and the non-obligatory demonstrative pronoun *tak* ‘so’ (lit. ‘like this’) which precedes the adjective. Unlike in the comparative, there is no preposition or complementizer.

The final assumption concerns the denotation of the equative marker. We follow the standard view that the meaning of *as... as* differs from the semantics of the comparative morpheme. However, we argue that it is not the case that the only difference between the two lies in employing the = or \geq relation instead of $>$, as often assumed (see [rett_measure_2015](#)). On contrary, we propose that unlike *-er* which requires a set of degrees as its first argument, see (25), *as... as* yields a function from sets of degrees to truth values for a particular degree (type $\langle d, \langle\langle d, t\rangle, t\rangle \rangle$), see (34). In other words, the equative operates on the maximal interval associated with a standard of comparison rather than on a set of degrees. This seems intuitively correct since equative constructions appear to evaluate values with respect to a particular degree rather than to a set of intervals. We assume the same applies to Czech *tak... jako* ‘as... as’.

$$(34) \quad \llbracket \text{as... as} \rrbracket = \lambda d \lambda D [\text{MAX}(D) = d] \quad \text{type } \langle d, \langle\langle d, t\rangle, t\rangle \rangle$$

Given the components discussed above, the reason why DNs are incompatible with equatives is simply because of type mismatch. Consider the structure of the DegP illustrated in (7.1.2). Since the equative does not involve the node of type $\langle d, t\rangle$ but rather the CP of type d , the DN cannot combine with any expression within the DegP via Predicate Modification. In principle, Function Application would still be applicable. Nevertheless, if a definite description denoted by the CP saturated the degree variable, the resulting expression could not combine with the equative marker. In any case, the derivation of (7b) would inevitably crash.



At this point, we consider the main puzzle of the paper solved. The (in)compatibility of DNs with comparatives and equatives is essentially type-driven. DNs

are of type $\langle d, t \rangle$, and thus in comparatives they modify the than-clause of the same type. On the other hand, since there is no such node available in equatives, DNs cannot find a plausible attachment site which leads to type mismatch and unacceptability of sentences such as (7b). In §7.2.2, we will demonstrate that ENs, unlike DNs, can appear in both comparatives and equatives due to the fact that they are of a different semantic type. However, before we move to *dvakrát*, let us briefly discuss adjectival DNs such as *dvojnásobný*.

7.1.3 Adjectival degree numerals

So far, the proposed semantics for DNs seems to work well. However, it is insufficient to account for the data which involve adjectival *dvojnásobný* modifying event and social role nominals, as discussed in §5.2. Inspired by **rett_polysemy_2014**'s (**rett_polysemy_2014**) M- Op_e and M- Op_d operators, we propose that the analysis of DNs can be extended by adopting operations which introduce mappings between entities, events, degrees, and time intervals.

In general, quantified NPs exhibit an individual/degree polysemy (**rett_polysemy_2014**). This is also true of Czech NPs modified by cardinal numerals. (36a) has an individual reading in which five individuated portions (or sorts) of beer were such that they were top-fermented. On the other hand, (36b) refers to an amount of beer rather than to particular entities (or sorts).

- (36) a. Pět piv bylo svrchně kvašených.
five beers was top fermented
'Five beers were top-fermented.'
- b. Pět piv {bylo pro Karla dost / Karlovi stačilo}.
five beers was for Karel enough for.Karel was.enough
'For Karel, five beers were enough.'

For DNs, we assume that the degree interpretation is the primary one, as in (37) where adjectival *dvojnásobný* modifies the amount nominal *plat* 'salary' in order to multiply the relevant degree.¹⁸ Apart from the data already introduced in favor of such a claim, further evidence comes from the fact that DNs can target gradable nouns such as *idiot* (see **morzycki2009degree**), as indicated in (38) which is an example attested in the CNC. The second clausal conjunct asserts that the speaker attributes to themselves the level of idiocy which is twice as high as the

¹⁸We assume that the composition involves at least the following steps: (i) modification of the amount noun (type $\langle d, t \rangle$) by the DN via Predicate Modification and then (ii) type-shifting of the entire phrase to the type d via the ι operation.

contextually relevant value. It is the internal degree argument of the predicate *idiot* that is targeted by the DN.

- (37) Dvojnásobný plat Karlovi stačil.
double salary for.Karel was.enough
'For Karel, double salary was enough.'
- (38) Bratr Čuchraj je idiot a lhář a já dvojnásobný idiot... (CNC)
brother Čuchraj is idiot and liar and I double idiot
'Frater Čuchraj is an idiot and a liar and I am a double idiot...'

Similarly, in the case of modified measure nouns such as *dvojnásobný objem* 'double volume', see (16a), we assume that the DN quantifies over the degree though it does not supply the dimension μ . The relevant dimension always seems to be provided by the modified predicate. For instance, in a phrase such as *dvojnásobně velký* 'twice as big' (lit. 'doubly big') it is the adjective that feeds the adverbial DN with the dimension of size. Likewise, in NPs such as *dvojnásobná délka* 'double the length' and *dvojnásobný idiot* 'double idiot' the measure noun and the gradable noun supply the dimensions of length and idiocy, respectively. In such examples, the DN simply multiplies values on a proper scale, hence it seems that the proposed degree semantics can be extended straightforwardly to capture such cases. We assume that the core of the analysis of *dvojnásobně* given in (23) would carry over to examples such as (38). In such cases, the DN predicates of a degree supplied by the adjective, measure noun, or gradable noun. However, due to the lack of space we have to postpone a thorough implementation of the general idea. Instead, in the next section we will try to suggest a way of dealing with the data that pose a more serious challenge.

7.1.4 Events and social role interpretations

In order to account for examples such *dvojnásobná vražda* 'double murder' and *dvojnásobný mistr* 'two-time champion', see (18), we assume mappings between events and entities on the one hand and entities and times on the other. Let us start with proposing a treatment for the social role interpretation. In such cases there is no internal degree argument the DN could target. Therefore, in order to approach, e.g., (18b), we adopt the notion of time trace function (e.g., *krifka_nominal_1989* and *lasersohn_plurality_1995*). A standard time trace function is an operation which maps an event onto its running time, i.e., the smallest time at which it occurs. For our purposes, however, this is insufficient since in

order to explain the behavior of phrases such as (18b) we need to relate events with entities. Therefore, we assume a mapping of a property P , in this case, the property of being a champion, onto its running time, i.e., the time of being a champion. Consequently, the DN counts the introduced running times which results in the predicate true of entities that repetitively gained the property of being a champion.

The proposed approach predicts that the time reading can only be obtained for nominals denoting properties which are constrained in time, i.e., either lower-bound, as in the case of *champion*, or bilaterally bound in the case of, e.g., *president*. In other words, adjectival DNs are only possible with nominals denoting a property which can be felicitously associated with fluctuation within the dimension of time (wagiel2015multiplicative). For this reason, the phrases in (39) constitute weird expressions.

- (39) # dvojnásobný Čech / člověk / pes
two-time Czech.person human dog

However, the interpretation of modified deverbal nominals such as *dvojnásobná vražda* ‘double murder’, see (18a), cannot be explained in terms of time trace function. In this case, we assume a mapping between properties of events and entities related to those events as themes, i.e., such a function for a particular event would return its themes. As a result, the two victims reading is obtained.

7.2 Event numerals

Our proposal concerning ENs builds on the classification developed by *doetjes_adverbs_2007* who on the basis of French data draws a distinction between two classes of adverbs of quantification, namely degree expressions such as *a lot* and frequency adverbs such as *often*. According to this view, the division follows from the fact that the first involve degree modification whereas the latter quantify over times.

7.2.1 Frequency and scope

At first sight, ENs seem to be similar to frequency adverbs since they both imply iteration and, unlike degree expressions, can scope over indefinites. The data in (40) illustrate the distinction between frequency and degree adverbs in Czech. Since a similar contrast regards ENs and DNs, as demonstrated in (41), it might seem appealing to simply claim that they are representatives of the corresponding classes.

- (40) a. Petr **často** kupoval nějaké pivo.
 Petr twice bought.IPFV some beer
 ‘Petr often bought some beer.’
- b. *Petr **hodně** kupoval nějaké pivo.
 Petr a.lot bought.IPFV some beer
- (41) a. Petr **dvakrát** koupil nějaké pivo.
 Petr twice bought.PFV some beer
 ‘Petr bought some beer twice.’
- b. *Petr **dvojnásobně** koupil nějaké pivo.
 Petr doubly bought.PFV some beer

According to **von_fintel_restrictions_1994**, frequency adverbs including ENs can be analyzed as expressions which quantify over situations and contain a hidden domain anaphor. Following **doetjes_adverbs_2007** in assuming an abstract restrictor *times*, it is possible to analyze ENs as in (42). The example in (41a) would then be interpreted as (43) which is true of two buying events in which Petr is the agent and beer is the theme of that event.

- (42) LF of *dvakrát*: 2 [restriction *times*][[nuclear scope VP/IP]]
- (43) $\exists ex[\mu(e) = 2 \wedge \text{BUY}(e) \wedge \theta_1(e) = \text{PETR} \wedge \theta_2(e) = x \wedge \text{BEER}(x)]$

However, as **doetjes_adverbs_2007** herself observes, there is a scopal asymmetry between expressions such as *often* and ENs, specifically frequency adverbs can have a relational reading whereas ENs cannot. For instance, in (44) the frequency adverb *často* ‘often’ can be interpreted either as having a wide or a narrow scope relative to *když* ‘when’. The relational reading in (44a) could be paraphrased as ‘often when he was in Budapest, Karel visited Gellért’. On the other hand, the non-relational reading in (44b) would be interpreted as ‘Whenever he was in Budapest, Karel often visited Gellért’. Crucially, (45) has only the interpretation in (45b) and cannot mean something like ‘Twice when he was in Budapest, Karel visited Gellért’.

- (44) Když byl Karel v Budapešti, tak byl **často** v Gellértru.
 when was Karel in Budapest then was often in Gellért
 ‘When Karel was in Budapest, he often visited Gellért.’
- a. often > when
- b. when > often

- (45) Když byl Karel v Budapešti, tak byl dvakrát v Gellértu.
 when was Karel in Budapest then was twice in Gellért
 'When Karel was in Budapest, he visited Gellért twice.'
 a. # twice > when
 b. when > twice

`doetjes_adverbs_2007` attributes the lack of relational reading to the incompatibility of ENs with the stative interpretation. However, ENs differ significantly from frequency adverbs in yet another respect, i.e., they are compatible with comparatives and equatives and can access internal arguments of degree verbs, as discussed in §3.1 and §3.2. On the other hand, frequency adverbs cannot target scales of degrees, e.g., (46) cannot mean that the height of Petr exceeds>equals the height of Marie multiple times. The only possible reading would be that there are many happenings in which Petr is taller/as tall as Marie which is a very strange interpretation. Similar, (47) can only mean that there were multiple events leading to an increase of the demand, i.e., the degree reading is unavailable.

- (46) # Petr je často vyšší než / tak vysoký jako Marie.
 Petr is often taller than so tall how Marie
- (47) Poptávka po dotacích rostla často.
 demand after subsidies increased. IPFV often
 'The demand for subsidies increased often.'

In light of the discussed data, we argue that the assumption that ENs simply quantify over times (which implies iteration) is insufficient to explain all the observed contrasts. Instead, we propose that there is a scale of adverbs of quantification with respect to how wide scope they can take, see Table 2. In particular, degree adverbs including DNs have the narrowest scope, ENs rank in the middle since they can scope over indefinites, and finally frequency adverbs can have the

Table 2: Scopal properties of adverbs of quantification

Property	Degree adverbs	Event numerals	Frequency adverbs
Access degrees	yes	yes	no
Scope over indefinites	no	yes	yes
Relational readings	no	no	yes

widest scope resulting in the possibility of relational readings but cannot access internal arguments of degree predicates. Here we see a promising correlation, specifically, the scope of an expression seems to correspond to its sortal polymorphism. At this point, we can only speculate on what the cause and what the consequence is, and hence we remain agnostic with respect to the nature of the relationship in question. Nevertheless, we intend to investigate this issue in future work.

We propose that the semantics of ENs is more general than that of frequency and degree adverbs. Essentially, we assume that they are basically able to target totally ordered sets of an unspecified type. Since non-stative eventualities comprise time scales which share core properties with degree scales, ENs are, thus, able to modify both events involving duration and degree expressions such as comparatives and equatives. On the other hand, frequency expressions such as *often* can operate only on a specified scale, i.e., a time scale, whereas degree adverbs including DNs target a scale of degrees.

7.2.2 Comparatives and equatives

Finally, let us discuss how ENs differ from DNs in equatives. Consider the examples in (6), repeated here as (48). We propose that in equatives ENs do not measure the gap between the degrees associated with the standard of comparison and the correlate as standard differentials. Instead, they multiply the degree associated with the standard.

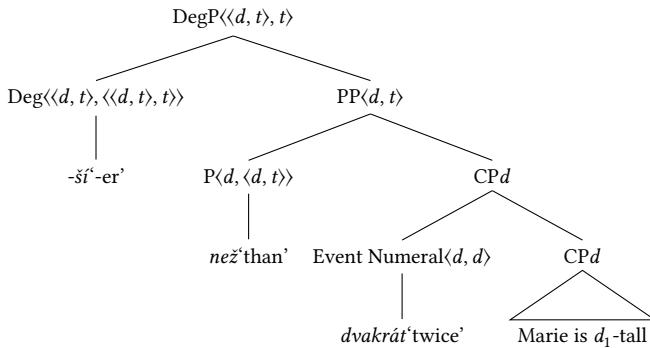
- (48) Petr je dvakrát vyšší než / tak vysoký jako Marie.
 Petr is twice taller than so tall how Marie
 ‘Petr is two times taller than / as tall as Marie.’

We assume that in comparatives and equatives, ENs are simple operators of type $\langle d, d \rangle$. They take a degree and return a value multiplied by the number corresponding to the numeral root, see (49a) for the semantics of *dvakrát* and (49b) for the generalized meaning of ENs. As a result, they are less sensitive to a particular structure of a phrase of comparison in which they can appear. We propose that within the DegP ENs pick CPs as their arguments. We hypothesize that their wider scope follows from that fact.

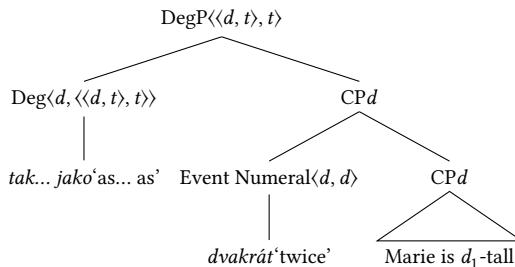
- (49) a. $\llbracket \text{dvakrát} \rrbracket = \lambda d[2 \times d]$ type $\langle d, d \rangle$
 b. $\llbracket \text{Event Numeral} \rrbracket = \lambda n \lambda d[n \times d]$ type $\langle n, \langle d, d \rangle \rangle$

Such a semantics fits nicely both with comparatives and equatives. In (50), the EN adjoins to the CP denoting the maximal interval corresponding to the standard of comparison, i.e., Marie's maximal height, before the partitive preposition applies. The EN returns the maximal degree to which Marie is tall multiplied by two and it is not until then that *než* yields a set of degrees the maximal degree corresponding to Marie is part of. The resulting $\langle d, t \rangle$ expression is compatible with the input requirement of the comparative marker *-ší*.

(50)



(51)



In the case of equatives, see (51), the composition proceeds in a parallel manner, the only difference being that there is no partitive preposition to shift the denotation of the CP to $\langle d, t \rangle$. As a result, the equative marker selects the degree provided by the outcome of the multiplication operation introduced by the EN.

Assuming pragmatic enrichment, as discussed in §7.1.1, in both cases we finally obtain the same truth conditions, as specified in (52). This corresponds to our intuition that both sentences are actually equivalent and would be judged true iff the maximal interval to which Petr is tall is equal to the maximal interval to which Marie is tall multiplied by two.

$$(52) \quad \llbracket (48) \rrbracket = \text{MAX}(\lambda d[\mu_{\text{HEIGHT}}(\text{PETR}) \geq d]) = 2 \times \mu_{\text{HEIGHT}}(\text{MARIE})$$

The proposed analysis seems to derive the desirable truth conditions and explains different behavior of ENs and DNs in constructions of comparison. Though our approach does not answer the question why ENs can be used to both modify degrees and count eventualities, we would like to speculate that a possible explanation lies in their type requirement. ENs seem to be polymorphic operators whose both domain and range consists of expressions of a primitive type *d* or *v* which allows then to target free relatives of degrees as well as event-denoting clauses. However, this hypothesis requires careful consideration and we leave this issue for further investigation.

8 Conclusion

In this paper, we have presented novel evidence from Czech concerning the distinction between two classes of adverbs of quantification, i.e., event numerals such as *dvakrát* ‘twice/two times’ and degree numerals such as *dvojnásobně* ‘doubly/twofold’. We have discussed their distribution and examined multiple contrasts in various environments including equatives and modification of count events. According to our proposal degree numerals denote properties of degrees, which explains their occurrence in predicate position as well as their ungrammaticality in equatives. On the other hand, event numerals have a more general semantics which results in wider scope as well as the ability to target both events and degrees. We have hypothesized that event numerals in comparatives and equatives behave as simple operators that yield a multiplied value of an input degree which allows for the compatibility with both comparatives and equatives. Furthermore, we have suggested a treatment for adjectival degree numerals such as *dvojnásobný* ‘double/two-time’. Nevertheless, many questions remain open. The exact and systematic representation of the meaning of event and degree numerals poses a challenge for further research. It would be also exciting to pursue a cross-linguistic investigation to explore even more properties of the discussed alternation.

Abbreviations

CNC	Czech National Corpus	EQ	equative
COMP	comparative	INS	instrumental
DN	degree numeral	(I)PFV	(im)perfective
EN	event numeral	REFL	reflexive pronoun

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Chapter 5

A thought on the form and the substance of Russian vowel reduction

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This paper is an attempt to formalize the Russian vowel reduction within a substance-free approach. My contribution consists in arguing that Russian vowel reduction is a strict quantitative phenomenon (not a qualitative phenomenon). Finally, I propose a motivation based on the representation of stress in different autosegmental frameworks.

Keywords: Russian vowel reduction, phonology, substance-free, Element Theory

[...] our mission is closer to one of revelation than of perfection.
(Hamilton 1980: 132)

1 Introduction

Russian vowel reduction is known to be a complex mechanism showing strong variations both in the realization and the neutralization of vowel phonemes. This paper is a modest contribution to the understanding of this phenomenon. My aim is to stress the difference between the SUBSTANCE and the FORM of Russian vowel reduction. In the line of Hjelmslev (1943/1971), I will assume a clear separation between the realization of distinctive units (which I call SUBSTANCE or PHONETICS) and their abstract relations (which I call FORM or PHONEMICS). Such a strong dichotomy was also recently renewed in Hale-Reiss2000 and Dresher (2008) (among others). The aim of this paper is not to compete on the same field as very valuable studies addressing the realization of Russian unstressed vowels (e.g. Crosswhite2000b; Crosswhite 2000; Padgett 2004; among others). These deal with phonetic realizations which are not central to the present paper. I rather

propose a parallel – substance-free – approach suggesting that the form of Russian vowel reduction is more consistent than its phonetic realization. More specifically, I argue that Russian vowel reduction can be interpreted as a quantitative phenomenon motivated by a length distinction between stressed and unstressed syllables.

In §2, I introduce the various substantial and formal manifestations of Russian vowel reduction. In §3, I propose to analyze Russian vowel reduction as a quantitative – rather than qualitative – phenomenon. Finally, in §4, I suggest that this quantitative phenomenon can be motivated by the representation of stress in some autosegmental frameworks.

2 The variation of Russian vowel reduction

Russian phonological inventory has five vowel phonemes in stressed syllables (1). Following Garde (1998: §19), I admit that [i] and [ɪ] are allophones of the same distinctive unit /i/: [i] occurs after hard consonants (except velars) and [ɪ] occurs elsewhere (Avanesov 1968: §8; Garde 1998: §95). The definition of vowel phonemes in terms of acoustic or articulatory features is not relevant for the substance-free approach advocated in this paper. For the time being, I simply define e.g. /i/ as a variable with relational properties $\neg/u/$, $\neg/a/$, $\neg/e/$ and $\neg/o/$.¹

(1) Russian stressed vowels

/i/	/u/
/e/	/o/
/a/	

The inventory in (1) undergoes a vowel reduction process in unstressed syllables. This process is manifested by (i) a phonetic difference between stressed and unstressed vowels and (ii) a neutralization of some phonological oppositions. Furthermore, both these substantial and formal aspects can vary according to the factors in (2).

- (2) a. prosodic context
 - b. segmental context
 - c. morphological context
 - d. dialectal context

¹I use the negation symbol \neg in order to represent oppositions: $x = \neg y$ should be read as $x \oplus y$ or “ x is right only if y is wrong.”

2.1 Phonological factors

Russian vowel reduction is conditioned by two phonological factors: (i) the segmental context (after hard consonants vs. soft consonants vs. š, ž or ts) and (ii) the prosodic context (first pretonic syllable vs. non-pretonic syllables).² I base the following description on the Standard Russian variety depicted in Avanesov (1968) and Garde (1980/1998).

2.1.1 After hard consonants

Russian vowel reduction after a hard consonant is illustrated in (3). In substantial (i.e. phonetic) terms, we observe a centralization of /a/ and /o/. The resulting vowel is realized as [e] in the first pretonic syllable (3a) and [ə] in other pretonic syllables (3b) or in post-tonic syllables (3c).³ Vowels /i/ and /u/ never reduce (Avanesov 1968: 38–42).⁴

(3)	Stressed	Unstressed
a.	gl[ˈa]z ‘eye’ n[ɔ]g-i ‘legs, feet’	gl[a]z-á ‘eye’ n[a]g-á ‘leg, foot’
b.	st[ˈa]r-yj ‘old’ g[ɔ]rod ‘city’	st[ə]r-ik-á ‘old man.GEN’ g[ə]rod-á ‘cities’
c.	šl-[ˈa] ‘walked.F’ šl-[ɔ] ‘walked.N’	upál-[ə] ‘fell.F’ upál-[ə] ‘fell.N’

In formal (i.e. phonemic) terms, the two centralization processes illustrated in (3a) and (3b)/(3c) result in the same neutralization of /a/ and /o/, represented by the merged box in (4). The place of /e/ (gray box) in this reorganization cannot be determined. Lexically, a stressed /e/ never occurs after a hard consonant (Garde 1998: §103). Even in (rare) loanwords, it never alternates with an unstressed vowel (e.g. *mér*, *mér-a*, *mér-u*, *mér-om*, *mér-e*, *mér-y*, etc. ‘mayor’). Regardless the place of /e/, the Russian vowel inventory is reduced to three distinctive units in unstressed context.

²Soft consonants are palatal or palatalized consonants. Hard consonants are non-palatal or non-palatalized consonants. Consonants š, ž and ts belong to a third category.

³However, a word-initial non pretonic /a/ or /o/ is unexpectedly realized as [ə] (e.g. [ə]tdavát’ ‘to give back’; see Avanesov 1968: §14), not [a].

⁴Default grammatical information (such as nominative or singular) is not glossed.

(4) Vowel reduction after hard consonants (Standard Russian)

[i] ^a , [i] ^b	[u]
	[e] ^c , [ə] ^d

- a. after a hard consonant (except velars)
- b. after a velar and in initial position
- c. in first pretonic syllable
- d. in other unstressed syllables

2.1.2 After soft consonants

Russian vowel reduction after a soft consonant is illustrated in (5). Substantially, /a/, /o/ and /e/ are fronted and raised to [i] in first pretonic (5a), in other pretonic syllables (5b), and in post-tonic syllables (5c).

(5) Stressed		Unstressed	
a.	p'[a]t' 'five'	p'[i]t-ók 'set of five'	
	n'[ɔ]s 'carried.M'	n'[i]s-ú 'I carry'	
	l'[ɛ]s 'forest'	l'[i]s-ók 'wood'	
b.	č'[a]s 'hour'	č'[i]s-ov-ój 'hourly.M'	
	č'[ɔ]rn-yj 'black.M'	č'[i]rn-ov-ík 'draft'	
	b'[ɛ]dn-yj 'poor.M'	b'[i]dn-otá 'poor person'	
c.	t'[a]-n-ut 'they pull'	vý-t'[i]-n-u 'I will pull out'	
	v'es'[ɔ]l-yj 'happy.M'	v'és'[i]l-o 'happily'	
	s'[ɛ]d 'grey-haired.M'	pró-s'[i]d' 'graying hair'	

Formally, the opposition between /a/, /e/, /o/ and /i/ is neutralized both in pretonic and non pretonic syllables (6a). It results that the Russian vowel inventory is reduced to two distinctive units in this context.

(6) Reduced vowels after soft consonants (Standard Russian)

	[u]
[i]	

2.1.3 After š, ž, and ts

Russian vowel reduction after š, ž, and ts is represented in (7). Substantially, /a/ is centralized to [e] in pretonic syllables (7a) and [ə] in non pretonic syllables (7b). As for /o/ and /e/, they are centralized to [i] in pretonic syllables (7c) and [ə] in non pretonic syllables (7d).

(7)	Stressed	Unstressed
a.	ž[ə]rk-ij loš[ə]d-k-a č[ɔ]n ts[ɛ]n ž[ɔ]lt-yj ts[ɛ]l-yj	'hot.M' 'little horse' 'wife.GEN.PL' 'price.GEN.PL' 'yellow.M' 'whole.M'
		ž[ə]r-á lóš[ə]d' ž[ɪ]n-á ts[ɪ]n-á ž[ə]lt-izn-á ts[ə]l-ik-óm
		'heat' 'horse' 'wife' 'price' 'yellowness' 'entirely'

Formally, the mechanisms observed in pretonic and non pretonic syllables are distinct. In pretonic syllables, a neutralization applies between /e/, /o/ and /i/ (8a). In non-pretonic syllables, a neutralization applies between /a/, /e/ and /o/ (8b). In both cases, it results that the Russian vowel inventory is reduced to three distinctive units.

(8) Reduced vowels after š, ž, ts (Standard Russian)

a. Pretonic

[i]	[u]
[ə]	

b. Non-pretonic

[i]	[u]
[ə]	

2.2 Morphological factors

The reduction patterns observed in inflectional suffixes (only after soft consonants and š, ž or ts) differ from the generalizations of §2.1.2 and §2.1.3, both substantially and formally.

Substantially, /a/ and /o/ are centralized to [ə] after soft consonants (9a) and š, ž or ts (9b). As for /e/, it is raised to [i] after a soft consonant (9c), and [i] after š, ž or ts (9d).

(9)	Stressed	Unstressed
a.	z' eml'-[a] b'el'j-[ɔ]	'earth.F' 'linen.N'
b.	duš-[a] kol'ts-[ɔ]	'soul.F' 'ring.N'
c.	b'el'j-[ɛ]	'linen.LOC'
d.	kol'ts-[ɛ]	'ring.LOC'
		dýn'-[ə] pól'-[ə] súš-[ə] lóž-[ə] pól'-[i] lóž-[i]
		'melon.F' 'field.N' 'dry land.F' 'couch.N' 'field.LOC' 'couch.LOC'

These reduction patterns have the same formal representation after a soft consonant and after š, ž or ts (8). A neutralization applies (i) between /i/ and /e/ and (ii) between /a/ and /o/. Again, it results that the Russian vowel inventory is reduced to three distinctive units in these contexts.

(10) **Reduced vowels in inflectional suffixes**

$[i]^a$, $[i]^b$	$[u]$	a. after a soft consonant
	$[ə]$	b. after š, ž, or ts

2.3 Dialectal factors

The reduction patterns described above concern the Standard Russian variety and are not shared by all dialects. In what follows, I give a brief overview of relevant dialectal features concerning the phonology of unstressed vowels.

Concerning the phonology of unstressed vowels after a hard consonant, Russian dialects can be divided into three groups: dialects with AKANYE (Avanesov 1949: §47), dialects with OKANYE (Avanesov 1949: §42), and dialects with UKANYE (Avanesov 1949: §43); see (9). I do not discuss subtypes such as varieties with DISSIMILATIVE AKANYE (Avanesov 1949: §49) and MIXED OKANYE-AKANYE (Avanesov 1949: §46).

(11) **Dialectal variations after a hard consonant**

- a. AKANYE: neutralization of /a/ and /o/
- b. OKANYE: no neutralization of /a/ and /o/
- c. UKANYE: neutralization of /o/ and /u/

Concerning the phonology of unstressed vowels after a soft consonant, Russian dialects can be divided into three other groups: dialects with YAKANYE (Avanesov 1949: §60), dialects with OKANYE (Avanesov 1949: §56), and dialects with IKANYE (Avanesov 1949: §59); see (12). Subtypes such as varieties with EKANYE (Avanesov 1949: §57) or DISSIMILATIVE YAKANYE (Avanesov 1949: §64) are not relevant to this paper.

(12) **Dialectal variations after a soft consonant**

- a. YAKANYE: neutralization of /a/, /o/, and /e/
- b. OKANYE: no neutralization of /a/, /e/, and /o/
- c. IKANYE: neutralization of /a/, /o/, /e/, and /i/

A schematic geographical distribution of the dialectal features in (9) and (12) are represented in Figure 1 (source: *Bukrinskaja-etal1994*).

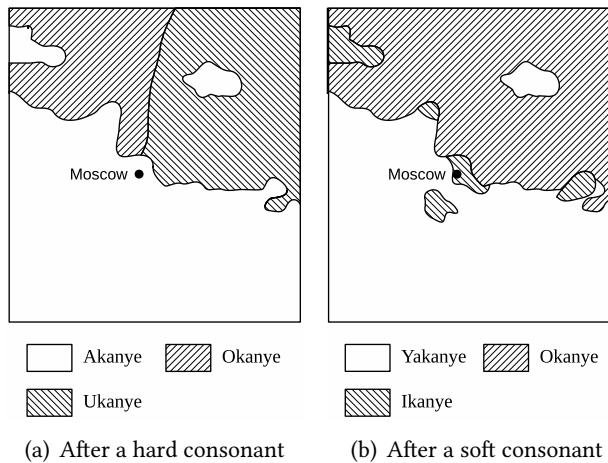


Figure 1: Distribution of dialectal variants of Russian vowel reduction

Dialects with proper Okanye have no vowel reduction (some subtypes can show some neutralizations in specific segmental contexts; see *Avanesov 1949*: §46, §56). Akanye and Ikanye refer to the reduction patterns illustrated in (4) and (6a) respectively. In what follows, I address the remaining Ukanye and Yakanye patterns.

2.3.1 Ukanye

Substantially, Ukanye is manifested by a raising of /o/ in both first pretonic syllables (13a) and other pretonic syllables (13b). A raising of /o/ can also be found in post-tonic syllables of several central and southern dialects (*Avanesov 1949*: §104) or in the Kamtchatka dialect (see *Gluschenko 2007*: 40).

Stressed		Unstressed	
a.	d[ɔ]m	'house'	d[u]m-ój 'home'
	x[ɔ]lod	'coldness'	x[u]lód-n-yj 'cold.M'
b.	g[ɔ]lub'	'dove'	g[u]lub'-éj 'dove.GEN.PL'
	[ɔ]strov	'island'	[u]strov-á 'islands'

Formally, this raising results in a reorganization of the vowel inventory into three distinctive units, due to the neutralization of the opposition between /o/ and /u/.

(14) **Ukanye**

[i]	[u]
	[a]

2.3.2 **Yakanye**

Yakanye is substantially manifested by a lowering of /o/ and /e/ after a soft consonant in pretonic syllables (12). Such a lowering of /o/ and /e/ can also be found in other pretonic syllables (see Avanesov 1949: §96) and in post-tonic syllables (Avanesov 1949: §108–112) of several central and southern dialects.⁵

(15) **Stressed**

p'[a]t'	'five'	p'[a]t-ók	'set of five'
n'[ɔ]s	'carried.M'	n'[a]s-ú	'I carry'
l'[ɛ]s	'forest'	l'[a]s-ók	'wood'

Unstressed

p'[a]t-ók	'set of five'
n'[a]s-ú	'I carry'
l'[a]s-ók	'wood'

Formally, this lowering also results in a reorganization of the vowel inventory into three distinctive units, due to the neutralization of the opposition between /a/, /o/, and /e/.

(16) **Yakanye**

[i]	[u]
	[a]

2.4 Summary

To conclude this section, we saw that the Russian vowel inventory is reduced to three distinctive units in unstressed syllables (except after a soft consonant in dialects with Ikanye; see (6a)). These three distinctive units are represented with /A/, /I/ and /U/ in (14).⁶

⁵The variation of post-tonic vowels is known to be very complex due to, e.g., morphological factors (Avanesov 1949: §107). Thus, it is only mentioned here.

⁶These symbols do not correspond to phonetic properties. They could be represented with features |A|, |B|, and |C|, or |X|, |Y|, and |Z|, etc.

(17) Russian unstressed vowels

/I/	/U/
/A/	

Now, if we assume that distinctive units are exclusively defined by a set of abstract relational properties, then the three distinctive units found in unstressed context (14) should not be assimilated to a subset of the five distinctive units found in stressed context (1). Each distinctive unit of the stressed context is defined by a set of oppositions to four other units (e.g. /i/ = $\neg/u/$, $\neg/a/$, $\neg/e/$, $\neg/o/$). But each distinctive unit found in unstressed context (14) is defined by a set of oppositions to two other units only (e.g. /I/ = $\neg/U/$, $\neg/A/$). In that sense, /I/, /A/, and /U/ are less specified than /i/, /e/, /a/, /o/, or /u/. They thus represent ARCHIPHONEMES. This notion will be discussed and defined below.

I suggest that the main formal aspect of Russian vowel reduction lies in this *underspecification* of vowel phonemes, not in the realizations that result from this underspecification.

3 Formal representation of Russian vowel reduction

In a substance-free approach, it could be tempting to interpret Russian vowel reduction as a simple redistribution of the five vowel phonemes into a reduced ternary inventory. Following such a hypothesis, every stressed vowel could freely alternate with every archiphoneme of the unstressed context. But this is not the case.

Table 1 outlines the various alternations between stressed vowels and their underspecified counterparts in unstressed syllables. It can be observed that these

Table 1: Alternation between stressed vowels and their underspecified counterparts

Stressed		Unstressed				
Type A (4)	Type B (6a)	Type C (8a)	Type D (8b), (13)	Type E (8)	Type F (11)	
/a/	/A/	/I/	/A/	/A/	/A/	/A/
/e/	-	/I/	/I/	/A/	/I/	-
/o/	/A/	/I/	/I/	/A/	/A/	/U/
/i/	/I/	/I/	/I/	/I/	/I/	/I/
/u/	/U/	/U/	/U/	/U/	/U/	/U/

alternations are constrained: e.g., /i/ and /u/ never alternate with the same archiphoneme. In order to formalize this constraint, we need to distinguish the behaviors of vowel phonemes by referring to their respective properties.

I propose to determine the formal properties of vowel phonemes based on the definition of archiphonemes in (15). According to this definition, two phonemes can alternate with the same archiphoneme iff they share a relevant feature. Thus, if /i/ and /u/ never alternate with the same archiphoneme, we can suppose that they do not share any relevant feature. The issue is that /i/ and /u/ seem to share some distinctive properties. Substantially, /i/ and /u/ are [+high]. Formally, they share relational properties such as $\neg/a/$, $\neg/e/$, and $\neg/o/$.

(18) **Definition of the archiphoneme** (Akamatsu 1988: 201)

The archiphoneme is a distinctive unit whose phonological content is identical with the relevant features common to the member phonemes of a neutralizable opposition, which is distinct from any of these member phonemes and which occurs in the position of neutralization.

One possible solution is to assume that the relational properties of phonemes are primitively organized into indivisible sets (e.g. $\{\neg/a/, \neg/u/, \neg/o/, \neg/e/\}$ for /i/ and $\{\neg/a/, \neg/i/, \neg/o/, \neg/e/\}$ for /u/). In this trivial example, /i/ and /u/ do not share any property. Such a representation of distinctive features by means of complex sets is defended in several models like, e.g., Particle Phonology (Schane 1984) or Element Theory (Kaye+etal1985). Element Theory assumes that distinctive features are organized into complex properties represented by $|A|$, $|I|$ and $|U|$.⁷ Each vowel can be defined by one or several of these properties.

Thus, based on the alternations in Table 1 (sketched in Figure 2) and the definition of archiphonemes in (15), it is now possible to determine the underlying representation of each stressed vowel in terms of abstract features $|A|$, $|I|$, and $|U|$, representing the indivisible properties of the three archiphonemes found in unstressed syllables.⁸

First, we saw that the vowels /i/ and /u/ never alternate with the same archiphoneme. Thus it can be supposed that they do not share any property. For convenience, I represent the distinct properties of /i/ and /u/ with $|I|$ and $|U|$ respectively. Second, /e/ and /i/ can alternate with the same archiphoneme (Types B, C, E). Thus /e/ contains $|I|$. Third, /o/ and /u/ can alternate with the same archiphoneme (Type F). Thus /o/ contains $|U|$. Fourth, /e/, /o/ and /a/ can altogether

⁷A substance-free reinterpretation of these features could be $\{\neg|I|, \neg|U|\}$, $\{\neg|A|, \neg|U|\}$ and $\{\neg|I|, \neg|A|\}$ respectively.

⁸Types B and C are not taken into account in this outline. They will be discussed below.

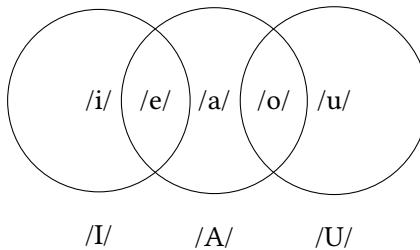


Figure 2: Outline of the neutralizable relations between vowel phonemes

alternate with an archiphoneme opposed to /I/ and /U/ (Types A, D). Thus they all share a property that is not |I| nor |U|. I represent this property with |A|. The resulting representation of stressed vowel is outlined in (16).

(19) Representation of Russian vowels (preliminary version)

I	U
AI	AU
A	

One can observe that /o/ and /a/ can also alternate with /i/ after a soft consonant, š, ž and ts (Types B, C). Accordingly, we should assume that they both contain an |I|. However, this leads to an important issue: in this case, both /e/ and /a/ would be defined by |IA|. Fortunately, it can be argued that the |I| found in this context is inherited from the preceding consonants. From the substantial point of view, these are palatal or palatalized segments that trigger a fronting and a raising of /o/ and /a/ via assimilation. From the formal point of view, it is more difficult to argue that soft consonants share an |I| feature with the archiphoneme /I/. Nevertheless, I already mentioned that /e/ is lexically found after soft consonants only (see §2.1.1). In other words, /e/ contains a feature that neutralizes the opposition between hard and soft consonants. This feature can be |I| or |A|; see (16). The vowel /a/ can be indistinctly preceded by a soft or a hard consonant. However, there is a correlation between /i/ and the hard/soft contrast: e.g., the verbal suffix -i always triggers a softening of the preceding consonant (e.g., *bro[s]-át* ‘throw.IPFV’ vs. *bro[s']-ít* ‘throw.PFV’). Thus, it can be supposed that the opposition between these two consonant classes is due to the presence of a property shared by /e/ and /i/, namely |I|.

The representation in (16) raises another issue concerning the definition of archiphonemes. Following the definition (15), the result of a neutralization pro-

cess is a *new* phonological item defined by the set of relations common to the member phonemes of a neutralized opposition. In this respect, |A|, which is the representation of the archiphoneme /A/, cannot be the representation of the fully specified vowel /a/. Indeed, the phoneme /a/ has something more than the archiphoneme /A/: it contrasts with /e/ and /o/. This property should be represented by an additional feature in /a/ distinguishing it from /A/. The only possible feature, distinct from |I| in /e/, |U| in /o/ and zero in /A/, is the |A| feature. Thus, if we want to represent the formal distinction between /a/ and /A/, we should assume that /a/ is a complex vowel made of two |A| features. Such a repetition of distinctive properties in the structure of vowels was already proposed in the Particle Theory of Schane (1984), developed in Carvalho (1993; 1994). Extending the same reasoning to the representation of /i/ and /u/, I now assume the representation of stressed and unstressed vowels in (20a) and (20b), respectively.

(20) Representation of Russian vowels (final version)

a. Stressed vowels

II	UU
AI	AU
AA	

b. Unstressed vowels

I	U
A	

Following this representation, Russian vowel reduction can be interpreted as a quantitative phenomenon. Stressed vowel have more distinctive properties than unstressed vowels. I propose to represent this distinction with the rule in (21a). This rule purposefully does not refer to the quality of distinctive properties. Indeed, such an ambiguity is likely to derive variations. According to this mechanism, /e/ can be reduced to |A| or |I|, and /o/ can be reduced |A| or |U|. This parametrical choice depends on the phonological, morphological and dialectal contexts. In order to account for the regularity of this choice in a given language variety, I propose the principle in (21b). The term “configuration” refers to (i) the representation of a given segment and (ii) both its phonological and morphological contexts. As an example, a pretonic /a/ and a non-pretonic /a/ represent two distinct configurations. They may or may not have two different interpretations.

(21) Principles of Russian vowel reduction (first attempt)

a. Unstressed vowels lose a distinctive property.

b. For a given speaker, a configuration A always has an interpretation B.

The principle in (21a) concerns the form of distinctive units, and the principle in (21b) concerns the substance of distinctive units. Following Hjelmslev (1936)

(here cited from Hjelmslev 1973), these principles refer to different components of the language: “phonematics” and “phonology”:

One and the same phonematic system may be pronounced by means of very different phonological systems. (Hjelmslev 1973: 159)

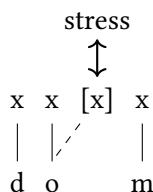
The contribution of this analysis consisted in suggesting that Russian vowel reduction can be analyzed as a strict quantitative phenomenon if we do not refer to substance. In the following section, I suggest that this quantitative phenomenon can be motivated by the representation of stress.

4 Motivation of Russian vowel reduction

In the previous section, we saw that the formal representation of Russian vowel reduction is strictly a matter of complexity (i.e., quantity of information). But one can ask: Why should an unstressed vowel have less distinctive properties than a stressed vowel?

Interestingly, Russian vowel reduction is related to another quantitative phenomenon conditioned by stress: Russian stressed vowels are phonetically longer than unstressed vowels (Zlatoustova 1953; Vysotskij 1973; Al'muhamedova-Kul'sharipova 1980; Svetozarova 1982: 155–158; Crosswhite 2000: 5–7; Crosswhite 2000b; Knjazev 2006: 43). Such a correlation between stress and vowel length can be observed in several languages, and it was represented with an extra time unit provided by stress in Chierchia (1986), Larsen (1998), Segeral-Scheer 2008, Crosswhite 2000b; Crosswhite (2000), Bucci (2013), and Enguehard (2016), among others. In what follows, I represent this extra unit with an x-slot on the right of the stressed nucleus (22).⁹

(22) d[ɔ]m ‘house’



The relation between vowel length and vowel reduction was already formalized in Crosswhite 2000b; Crosswhite (2000). Crosswhite proposed that the sonority

⁹One could object that length belongs to the substance while stress belongs to the form. Alternatively, Enguehard (2016) proposed that the relation between them could be inverted: stress is a possible substantial realization of length.

of vowels is conditioned by the presence of a mora in stressed and pretonic syllables. Here, I propose to take the additional step of unifying length and Russian vowel reduction with the following generalization: the amount of realized vowel features is proportional to the amount of available skeletal slots. If a vowel stands in a stressed position, it has two available slots and all its distinctive properties are manifested (23a). If a vowel stands in an unstressed position, it has one available slot and only one of its distinctive properties can be manifested (23b). It turns out that Russian mid vowels are abstractly represented as sorts of diphthongs.¹⁰

(23) a. d[ɔ]m 'house'	b. d[ɐ]má 'houses'
$\begin{array}{cccc} \text{stress} & & \text{stress} & \\ \uparrow & & \uparrow & \\ x & x & [x] & x \\ & & & \\ d & A & m & \\ & & \vdots & \\ U & - & & \end{array}$	$\begin{array}{ccccc} & & & & \text{stress} \\ & & & & \uparrow \\ x & x & x & x & [x] \\ & & & & \\ d & A & m & A & \\ & & \vdots & & \vdots \\ (U) & - & & & - \end{array}$

Note that the distinctive property that is manifested in (23b) is not necessarily $|A|$. In a dialect with Ukanye, the realized property is $|U|$ (e.g., $d[\emptyset]mój$ vs. $d[u]mój$ 'home').

5 Conclusion

As a conclusion, this paper is an attempt to formalize Russian vowel reduction without referring to substance. I suggested that Russian vowel reduction does not handle the quality of vowel phonemes, but the quantity of their distinctive properties. Then, I proposed that the quantity of distinctive properties is conditioned by the quantity of skeletal slots. In that sense, Russian qualitative distinction between stressed and unstressed syllables is not very different from length distinctions observed in languages like Italian (see Parmenter-Carman 1932). Such a generalization supposes an interesting convergence (for further studies) between paradigmatic and syntagmatic axes.

¹⁰Note that this would be an issue if Russian had *real* diphthongs. But it does not have any.

Abbreviations

F	feminine	M	masculine
GEN	genitive	N	neuter
IPFV	imperfective	PFV	perfective
LOC	locative	PL	plural

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Chapter 6

The Russian perfective present in performative utterances

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This paper aims to show that perfective verbs in Russian can – contrary to common sense – be used in performative utterances without lacking the performative meaning of the sentences. In Russian, performative utterances are generally built with an imperfective (ipv) verb in present tense, first person singular or plural. According to the Slavistic literature, the perfective (pv) verb is at most used in marked contexts and with a few selected performative verbs. In our contribution, we will show experimentally that the use of present perfective verbs in performative utterances is considerably more widespread than supposed so far. In two experiments, Russian native speakers located events in time, providing evidence, first, for the temporal interpretation of the sentence depending on the verbal aspect, and second, concerning whether the temporal interpretation differs depending on how much context is given.

Keywords: Russian, verbal aspect, speech act, performative verbs, interpretation, experimental evidence

1 Introduction

1.1 General remarks

Aspect use in performative utterances in Russian is the core issue of the present paper. We adopt the terminology of Eckardt (2012) and define a performative utterance as a sentence that is used to issue a speech act by applying a speech act verb. Since the present tense of the verb is a precondition for a performative utterance, the IPV verbal aspect is preferred in Russian. However, the Slavistic research literature describes cases where a performative speech act is expressed by a PV verb. This is interesting, because the PV aspect is thought of being unable to appear in present tense. Example (1a) shows a sentence expressing an ordinary correct performative speech act, whereas the corresponding version (1b) with PV *predložu* is unacceptable. Example (2) demonstrates the same mismatch with another speech act verb:

- (1) a. Predlagaju otpravit'sja domoj.
propose.IPV go home
'I propose to go home.'
- b. * Predložu otpravit'sja domoj.
propose.PV go home
Intended: 'I propose to go home.'
- (2) Ja bol'se nikogda ne budu krast',
'I will not steal any more,'
- a. kljanjus' ot čistogo serdca.
swear.IPV from pure heart
'I swear with all my heart.'
- b. * pokljanus' ot čistogo serdca.
swear.PV from pure heart
Intended: 'I swear with all my heart.'

Different from the verbs in (1) and (2), there are other speech act verbs allowing PV aspect, as in (3):

- (3) a. Ja prošu vas govorit' gromko i po oceredi.
I ask.IPV you speak loud and by order
'I ask you to speak loudly and one by one.'

- b. Ja poprošu vas govorit' gromko i po očeredi.
 I ask.PV you speak loud and by order
 'I ask you to speak loudly and one by one.'

Dickey (2000), for example, has noticed that for some speech act verbs in performative utterances both IPV and PV aspect can be used. Thus, his study is limited to some particular verbs like the PV *verba dicendi skazat'* 'to tell', *priznat'sja* 'to confess', *zametit'* 'to note', *pribavit'* 'to add', *poprosit'* 'to ask for', *povtorit'* 'to repeat', *doložit'* 'to report' (Dickey 2000: 179). In his opinion, some PV *verba dicendi* are not allowed, like *predložit'* 'to propose' and *pokljast'sja* 'to swear'; see (1) and (2).

We want to show that PV speech act verbs can perform performative utterances to a larger extent than previously expected. We do not assume that the PV and IPV performative utterances are used interchangeably. In our opinion, a PV speech act verb has an influence on the pragmatic interpretation of the speech act. We will not investigate interpretation differences in depth in this paper, but rather we want to experimentally establish that both aspects can indeed be used to utter a performative speech act.

In the following, we give a short overview of the Russian aspectual system (§1.2). Afterwards we explain the peculiarities of performative speech acts and how aspect use is related to it (§1.3). Then, the phenomenon of the present perfective is described, which has been intensively studied in the Slavistic literature (§1.4). Subsequently, we discuss the present perfective in performative speech acts and present the relevant literature on Russian performatives (§1.5). These theoretical issues are followed by the presentation of two experiments that we have conducted in St. Petersburg in 2016 (§2). Finally, we discuss our results and give an outlook for future research (§3).

1.2 The Russian aspectual system and tense

In Russian, aspect is a grammaticalized category. Nearly every Russian verb has two aspects that are morphologically distinguished and differ in grammatical function: the imperfective aspect (IPV) and the perfective aspect (PV). These verb pairs are derived by prefixes or suffixes: *pisat'* 'to write.IPV' and *napisat'* 'to write.PV'; *otkryt'* 'to open.PV' and *otkryvat'* 'to open.IPV'.¹ The IPV aspect is used

¹Other verb pairs are opposed by suffix only: *kričat'* – *kriknut'* 'to cry' or by suppletion *brat'* – *vzjat'* 'to take'. A smaller group of verbs do not form pairs: (i) biaspectual verbs: *kaznit'* 'to punish', (ii) *imperfectiva tantum*: *sidet'* 'to sit', and (iii) *perfectiva tantum*: *rinut'sja* 'to pounce on'.

for (i) habitual or iterated actions, (ii) single, incomplete actions in progress, and (iii) actions which do not emphasize the result. The PV aspect is used (i) for single, completed actions or (ii) ongoing actions intended to be completed.²

Morphosyntactically there exist only three tense categories: preterite, present, and future. Not all three categories are represented in both IPV and PV aspect. Whereas IPV verbs conceptualize all three tense categories, PV verbs appear only in preterite and future, because present tense is not compatible with the concept of completeness. The lack of present tense marking for PV verbs plays a key role in our investigation. Table 1, a simplified version of Swan (1978), summarizes the (semantic) categories resulting from crossing aspect with tense in Russian.

Table 1: Tense and aspect in Russian

	past	present	future
IPV	✓	✓	✓ (with ‘be’ + infinitive)
PV	✓	✗	✓

1.3 Performatives

A speech act is called performative when the utterance and the action named by a speech act verb take place simultaneously. The utterance is part of the action (Austin 1962) and performs it. Performative utterances are not statements that are true or false, but concrete, unique actions. In Russian, by default, performatives are expressed with the IPV aspect present, first person; see examples (4)–(6).

- (4) Obeščaju tebe poechat' k babuške.
 promise.IPV you go to grandmother
 ‘I promise you to go to grandmother.’
- (5) Blagodarju za ponimanie.
 thank.IPV for understanding
 ‘Thank you for understanding.’

²There is a huge range of works on verbal aspect and its meaning to which we cannot refer in this paper. Therefore we limited our selection to pure Slavistic or Russian works that are generally accepted among Slavists and in Russian aspectology: Bondarko 1971; Mehlig 1980; Rassudova 1968; Anstatt (2003); Avilova (1976); Breu (1980; 2000); Comrie (1976); Dickey (2000); Galton (1976); Klein (1995); Lehmann (1999); Maslov (1984); Padučeva (1996); Petručina (2000); Zaliznjak & Šmelev (2000); etc.

- (6) Ja očen' žaleju, čto my ne vstrelis' s vami.
 I very apologize.IPV that we not meet with you
 'I deeply apologize, that we didn't meet you.'

We share the opinion with [Apresjan \(1988\)](#), [Padučeva \(1994\)](#), and [Petruchina \(2000\)](#) that performative verbs in Russian can only express a punctual event and not a process. They do not describe an ongoing event, because the action expressed by the verb is accomplished once the speaker finishes the utterance ([Petruchina 2000](#)). Therefore, it would be incorrect to translate one of the above examples, for instance (4), with the English continuous form: **I am promising you to go to grandmother.*³

As PV cannot get a present tense marking in Russian, we would expect that only the IPV speech act verbs can be used in performative speech acts. However, we have found examples with PV speech act verbs in performative speech acts, as in (7a) from the Russian National Corpus (RNC):⁴

- (7) a. Pozdravim že našich peredovikov i zaodno
 congratulate.PV.1PL PTCL our labor.activists and simultaneously
 prezidenta s neverojatnym uspechom!
 president with amazing success
- b. Pozdravljaem že našich peredovikov i zaodno
 congratulate.IPV.1PL PTCL our labor.activists and simultaneously
 prezidenta s neverojatnym uspechom!
 president with amazing success
- 'We congratulate our labor activists and also the president for the amazing success.'

In (7a) the PV speech act verb *pozdravim* 'congratulate.PV.1PL' is used to perform a speech act. In (7b) we replaced the PV verb of the original sentence with the corresponding IPV verb *pozdravljaem* 'congratulate.IPV.1PL'. (7b) is a properly built performative sentence with the IPV verb meeting all three conditions for a successful performative speech act: speech act verb, first person, and present tense. We find it plausible to assume that (7a) expresses a performative speech act, too.

³[Harnish \(2007\)](#) discusses the English present progressive in performatives and shows that performative utterances favor the simple present.

⁴Interestingly, PV speech act verbs systematically fail the 'hereby'-test, which is only feasible with IPV verbs: *S étim ja prošu[ipv] vas govorit' gromko*. 'Hereby I ask you to speak loudly' vs. **S étim ja poprošu[pv] vas govorit' gromko* ([Eckardt 2012](#)).

It is interesting for us whether a PV speech act verb changes the sentence meaning compared to the corresponding IPV verb, for instance with respect to our variants (7a) versus (7b). The occurrence of present perfective speech act verbs is documented in many works, but we don't know of any experimental investigation addressing the interpretation of performative utterances as a function of the verb aspect. Are utterances with PV speech act verbs actually understood as performative speech acts? If yes, what does this imply for the temporal localization of the event denoted by the PV speech act verb? In our study we presuppose that the localization of an event denoted by a speech act verb in the present indicates a performative interpretation. We feel confident that sentences with PV speech act verbs are performative utterances only in the case that they express an event that proceeds simultaneously with the utterance time. This is only possible, when the PV speech act verb is interpreted as present perfective.

In the next section we will present arguments for a PV in performative utterances in Russian and invoke the debate on the present perfective.

1.4 The present perfective in Russian

The debate on the present perfective started with Koschmieder (1929). He declares, initially only for Polish, that present perfective is possible in non-future meaning solely when the action time coincides with the utterance time and when the verb is in first person form. Forsyth (1970: 120) even claims: "Their use in non-future meanings, however, is extremely common and not on the least exceptional." Švedova (1980) supports this view and notes that under certain syntactic conditions the PV verb can denote actions that take place in the present and not in the future with nuances of meaning. Rathmayr (1976) goes even further. She is of the opinion that the present perfective is equal to IPV present plus some stylistic function; yet the stylistic properties are difficult to identify: Even if they are identified by a survey of native speakers they are anticipated to strongly diverge.

Dickey (2000), as before him Bondarko1971 and Galton (1976), calls the phenomenon of present perfective "the temporal coincidence of a situation that is referred to a PV present form in the moment of the utterances". The present perfective does not refer to the future but to the time of utterance and, simultaneously, to the time at which the action denoted by the PV verb takes place. Dewit2017 dubs the phenomenon differently, "the present perfective paradox", because the meaning of the temporal localization that belongs to the PV aspect should prevent the use of present perfective in Russian. Additionally, the occurrence of present perfective in Russian is explained in terms of the aspectual function of the PV aspect. Dewit2017 agrees with Breu (2000) who notices that the aspectual meaning

of the present perfective is stronger than the temporal meaning. In present perfectives, the aspectual meaning should be stronger than the temporal meaning of the aspect, because the meaning of temporal localization that is expressed by the PV aspect would prevent the use of present perfective. We will discuss this view at the end of the paper.

So far we have argued for the availability of a present perfective in Russian. But it still remains open, however, what kind of influence perfective present has in contexts where it substitutes the IPV.

1.5 The range of present perfective in performatives

Like others, we accept the present perfective as means of expressions with the above mentioned readings. We argue that the high acceptability of present perfective implies that PV speech act verbs are able to fulfill a performative speech act. This is a purely theoretical assumption and based on the mentioned theoretical works, empirically supported only in a few cases by way of corpus data (Laczinski2014; Wiemer 2014). Before we present our experimental work, it is necessary to mention some aspects concerning the type of speech act verbs that are used in IPV and PV as well as to give possible conceptual differences between the use of IPV and PV speech act verbs that are offered in the research literature.

In the Slavistic research literature several works attest the occurrence of PV speech act verbs in performative speech acts. But the use of PV verbs, according to these works, is limited to special verb types. For example, Rjabceva1992 and Dickey (2000) claim that only a few PV *verba dicendi* can be used in competition with IPV performatives. Only for those verbs the PV verb may be used and only those PV verbs may perform a performative utterance. Contrary to Rjabceva1992 and Dickey, Wiemer shows that the use of PV speech act verbs is also possible for some social performatives like request, desire, thanks, refusal and approval, see example (8). Laczinski2014 agrees with Wiemer and demonstrates similar corpus data for Polish, Czech and Slovak.

- (8) Ispol'zuja èti sposoby, uverju čto vam budet legko zanimat'sja
using this methods, assure.PV that you.DAT will.be easily study
russkim jazykom.
Russian language
'When you use this methods, I assure that you will easily learn Russian.'
(Wiemer 2014: 107)

The corpus findings of Wiemer and Laczinski2014 lead us to the question, whether

the range of PV verbs in performative utterances is wider than Rjabceva 1992 and Dickey assume. Some more detailed consideration is given by Israeli (1996; 2001). She classifies speech act verbs into three groups depending on the verbal aspect that a speech act verb can take to perform a speech act (Israeli 2001: 84): (i) verbs performing a speech act only with IPV (see (1) and (2)), for example *prikazyvat'* 'to order.IPV', *trebovat'* 'to demand.IPV', *blagodarit'* 'to thank.IPV', *pozdravljal'* 'to congratulate.IPV' etc., often the IPV speech act verb has an iterative meaning; (ii) verbs performing a speech act both with IPV and PV (see (3)), for example *prosit'/poprosit'* 'to request.IPV/.PV', *sovetovat'/posovetovat'* 'to advise.IPV/.PV', *želat'/poželat'* 'to wish.IPV/.PV', etc.; (iii) verbs performing a speech act only with PV; in the latter case, the verb functions as structuring element, like *perejděm k novoj teme* 'let's open.PV a new future topic', *otmetim* 'we note.PV', *zametim* 'we mention.PV' etc. (see example (10)).

- (9) Govorju tebe – živ, živ!
say.IPV you living, living
'I'm telling you – I'm alive, alive!'
- (10) Ja vam bol'se skažu: net povesti pečal'nee na svete.
I you say.PV more: NEG.is story sadder in world
'Even more, there's no sadder story in the world.'

According to Israeli (2001), IPV and PV performative utterances of the second group cannot be used interchangeably. This makes the aspectual competition particularly interesting for us. Although the alleged semantic or pragmatic differences in the interpretation of IPV and PV speech act verbs are not the central issue of this paper, we would like to shortly address Israeli's account. Whereas we believe that her account provides a promising perspective for future investigation, the first task accomplished here is to provide evidence that PV verbs actually can be used in carrying out a performative speech act.

Israeli argues that IPV and PV speech act verbs differ with respect to authority marking in performative utterances. A typical example for the authority marking in performative utterances in her sense is seen in (11a) from the oral corpus of the RNC. According to Israeli, the sentence shows, in comparison with (11b), how the different aspect use can influence the speaker's position of authority:

- (11) a. *Situation:* Teacher to student:
Ja poprošu vas govorit' gromko i po oceredi.
I ask.PV.1SG you speak loud and by order
'I ask you to speak loudly and one by one' (RNC, oral corpus)
- b. *Situation:* Young man to museum attendant:

Prošu vas nikomu ni zvuka!
 ask.IPV.1SG you nobody no word
 'I ask you to tell nobody.' (RNC, oral corpus)

The use of the PV verb *poprosit'* 'to ask.PV for' in (11a) can be connected with the communicative situation. The PV speech act verb stresses the authority of the teacher [+authority] towards the student. In (11b) the IPV verb *prosit'* 'to ask.IPV for' is used in a communication between a young man and a museum attendant. We might argue with Israeli that the IPV verb in (11b) is pragmatically neutral or even a polite request.⁵ In §2 we will now present our two experiments that give evidence that sentences with a PV speech act verb are interpreted as present tense utterances.

2 Experimental evidence

We have provided instances of present perfective in performative speech acts in Russian from the literature as well as from the RNC. The interpretation of the PV speech acts has not yet been demonstrated experimentally. Rathmayr (1976) mentions that she has asked four (sic!) informants and every one of them has given her another interpretation. Others work with their own intuition or support their arguments by presenting examples from corpus investigation (Laczinski 2014; Wiemer 2014). The main concern is to study if sentences like (11a) are interpreted as performative speech acts or not. In (11a) the verb has the grammatical form 1SG PV aspect. The additional meaning that refers to the aspect function of PV aspect would be 'will ask for'. In future meaning the sentence is not a performative speech act but a statement about an event in the future: In the future there will be a situation in which I am saying *I ask you to speak loudly and one by one*. Our aim is now to investigate the temporal alignment of PV performative verbs in morphological present.

Our assumption is that in performative context the use of the present perfective is becoming more widespread than it is reflected in the literature so far. We even tend to assume that every PV speech act verb can principally be used to execute a performative speech act. Our experiments reported below compare the

⁵The examples (11a) and (11b) do not only differ in aspect use. In addition, the [+authority] marked utterance (11a) has an overt subject *ja* 'I' whereas in (11b) there is a null subject. We also agree with one of the reviewers that the sentences improve with overt subject. Our own corpus investigation leads us to the assumption that an overt subject encourages the [+authority] marker. We did not yet test sentences with overt subjects experimentally, but consider it a future task to do so.

temporal interpretation of speech act verbs with perfective versus imperfective aspect: Are PV speech act verbs never or reliably less often interpreted as present tense IPV speech act verbs? We assume that:

- A future tense interpretation indicates that the event denoted by the PV verb does not coincide with the time of utterance, that is, the tense is not considered present perfective and the sentence is not understood as a performative speech act.
- A present tense interpretation indicates that the event denoted by the PV verb coincides with the time of utterance and, therefore, the tense is considered present perfective. The performative reading is thus available. In the case of performative utterances the context can also be a pragmatic presupposition. The hearer expects the honesty of the speaker who cares about the success of the rules.

The two experiments that are presented in this section test our hypothesis that PV speech act verbs used in performative utterances may substitute IPV verbs.

2.1 Method

2.1.1 Participants

41 native speakers of Russian participated in Experiment 1 without STOP-READING (as explained in §2.1.3 below), a different sample of 40 Russian native speakers took part in Experiment 2 with STOP-READING. All participants were students of Saint Petersburg State University. They were paid 10 ₽ for their participation.

2.1.2 Material

20 verbs were selected from a pool of 28 speech act verbs, based on acceptability scores gathered in a web-based pilot study:⁶ *uverit' / uverjat'* ‘to assure sth. to so’, *izvinit'sja / izvinjat'sja* ‘to apologize for sth.’, *poprosit' / prosit'* ‘to ask for sth.’, *potrebovat' / trebovat'* ‘to demand sth. from so’, *poželat' / ženat'* ‘to wish sth. to so.’, *poblagodarit' / blagodarit'* ‘to thank so. for sth.’, *priznat'sja / priznават'ja* ‘to admit sth. to so.’, *priglašat' / priglasit'* ‘to invite so. to sth.’, *razrešit' / razrešat'* ‘to allow so. to do sth.’, *objazyvat'sja / objazat'sja* ‘to commit oneself

⁶ 43 Russian native speakers judged performatives containing the verbs without preceding context on a scale from 0 to 6 (= most acceptable); mean acceptabilities of the 20 selected verbs were 3.7 (SD 0.96) and 1.7 (SD 0.96) for performatives with IPV and PV verb aspect, respectively.

to sth.', *pochvalit'* / *chvalit'* 'to praise so. for sth.', *predupredit'* / *predupreždat'* 'to warn so. of sth.', *predstavit'* / *predstavljan'* 'to introduce so. to so.', *poprivotstvovat'* / *privetstvovat'* 'to welcome so.', *priznat'* / *priznavat'* 'to recognize so. as so.', *prikazat'* / *prikazyvat'* 'to order so. to do sth.', *otklonit'* / *otklonjan'* 'to reject sth.', *pozdravljat'* / *pozdravljat'* 'to congratulate so. for sth.', *prostit'* / *proščat'* 'to forgive sth. to so.', *otkazat'* / *otkazyvat'* 'to refuse sth. to so.'

Two variants of a performative target sentence (in short: performative) were constructed for each verb. The variants differed only in the aspect of the sentence initial verb which was either imperfective or perfective present in the first person singular, exemplified in (12a) and (12b). Both performative variants were preceded by the same context consisting of two or three sentences.⁷

- (12) *Context:* Vere predlagajut novuju dolžnost' na rabote. Ona dolgo kolebletsja, no eë načal'nik govorit:

'Vera is offered a new position at work. She hesitates for a long time, but her boss says:'

- a. Uverjaju Vas, čto éta dolžnost' – važnyj šag na puti k assure.IPV.PRES.1SG you that this position great step on way to uspechu.
success
- b. Uverju Vas, čto éta dolžnost' – važnyj šag na puti k assure.PV.PRES.1SG you that this position great step on way to uspechu.
success

'I assure you, that this position is a great step towards success.'

In addition to the performatives, two variants of non-performative, declarative target sentences (in short: declaratives) were constructed for each of the twenty verbs, serving as control items. Again, the target variants differed only in the aspect of the verb which was either IPV or PV past in the third person singular, as exemplified in (13a) and (13b). Both declarative variants were preceded by the same context which differed from the one of the performatives.

- (13) *Context:* Terapevt zaxodil v palatu k pacientam po utram.

'The therapist came to the patients into the ward in the morning.'

⁷The complete list of stimuli can be found here: <http://hdl.handle.net/11022/0000-0007-CB0A-A@Appendix.pdf>.

- a. Vrač uverjal ich v tom, čto oni vse skoro
doctor assure.IPV.PAST.3SG them at that, that they all soon
vyzdorovejut.
will.recover
- b. Vrač uveril ich v tom, čto oni vse skoro
doctor assure.PV.PAST.3SG them at that, that they all soon
vyzdorovejut.
will.recover

‘The doctor assured them, that they will all recover soon.’

In addition to the performatives and the controls, 40 fillers were added to the material. The two variants of the performatives and the controls were assigned to two lists such that each item variant was assigned to one of the lists and either list contained 10 performatives and 10 controls with IPV and PV aspect. About the same number of participants was tested with either list, hence all participants worked on a set of 80 items consisting of a context followed by a target.

2.1.3 Procedure

Participants were tested separately in a quiet room at the Laboratory of Cognitive Studies at the State University of Saint Petersburg. Participants were randomly assigned to Experiment 1 without STOP-READING or Experiment 2 with STOP-READING. Participants were seated in front of a PC and instructed about the task to be performed. In each experiment participants worked on three practice trials to get familiar with the procedure before they moved on to the experimental block of trials.

In Experiment 1 without STOP-READING, a trial began with a full presentation of the context. Participants read the context until they understood what happened and then pressed the space bar. Now the context was replaced by the target sentence displayed left-aligned in the centre of the screen. Participants read the target sentence to understand what happened next; their task was to indicate by means of three cursor keys, where the event described in the target sentence was located in time: ‘←’ ≈ past, ‘↑’ ≈ present, ‘→’ ≈ future (Response 1). For the sake of congruence with Experiment 2, the whole sentence was presented again immediately after Response 1, prompting participants to indicate the location again by pressing one of the cursor keys (Response 2). In order to encourage participants to read the contexts and targets carefully, half of the trials ended with a yes-no comprehension question that was answered by means of two designated

keys (mean accuracy: 91%). A session lasted for about 20 minutes.

Trials in Experiment 2 with STOP-READING began with a full presentation of the context, too. Once participants understood what was told in the context they pressed the space bar. Now the context was replaced by the target sentence displayed left-aligned in the centre of the screen, yet masked except for the first word; masked characters other than blanks were substituted by underscores. Participants could then read the target sentence from left to right in a word by word fashion (moving window technique): with the first press of the space bar the first word was masked and the second word was uncovered; with each subsequent press the current word disappeared and the following word showed up. In this way participants could proceed until the end of the sentence. However, beginning with the presentation of the first word of the target sentence, participants could stop reading at any time by pressing one of the cursor keys instead of the space bar if they felt able to indicate where the described event is located in time: ‘ \leftarrow ’ $\hat{=}$ past, ‘ \uparrow ’ $\hat{=}$ present, ‘ \rightarrow ’ $\hat{=}$ future (Response 1). Immediately after Response 1, the sentence was presented as a whole, prompting participants to indicate the location again via a cursor key (Response 2). Half of the trials ended with prompting an answer to a yes-no comprehension question (mean accuracy: 91%). A session lasted for about 30 minutes.

2.1.4 Main objectives

It was of main interest where events described by performatives are located in time. Events described by performatives are expected to be located in the present if they are interpreted as a performative speech act; non-performative interpretations should lead to localizations in the future. Performatives with IPV verb aspect should therefore generally lead to localizations in the present. Performatives with PV verb aspect are expected to also lead to a substantial amount of localizations in the present. The greater the loss of performative power due to the PV aspect, the more reduced should be the frequency of localizations in the present. If the localization in time depends to a large extent on the verb aspect, i.e., on verb morphology, the localization should be quite insensitive to the remaining content of the target sentence. In particular, localizations should be unaffected by the possibility to stop reading.

2.2 Results

The data were subjected to a generalized linear mixed model (GLMM) with a binomial link function, using the *lmer* function of the *lme4* package (Bates et al.

2015) for the R software for statistical computing (team2014r). When preparing the data for analysis, we had to realise that the performative target sentences for five of the 20 verbs deviated crucially from the stipulated structure in that the speech act verb was placed later than sentence-initially (see items 8, 13, 14, 18 und 20 in the stimuli; see link in footnote 7). One additional item, 6, had to be dropped due to a wrong stress marking. The analysis is thus based on 14 performatives, with 6 and 8 items instantiating the same condition on the two lists. α -errors for z -values are marked as follows: *** if $p < .001$; ** if $p < .01$; * if $p < .05$.

2.2.1 Response 2 in Experiments 1 and 2

Localizations in the present or future are valid if occurring after performatives (98% and 96% valid in Exp.s 1 and 2); localizations in the past are valid if occurring after declaratives (88% and 89% valid in Exp.s 1 and 2). The proportions of valid localizations in the present are 81% versus 70% for IPV and PV aspect in Experiment 1 and 78% versus 52% in Experiment 2. The GLMM converged for random intercepts for participants and random intercepts and slopes for items. In addition to the two main effects of Aspect and Experiment, the interaction was also significant [Asp: $z = 4.50^{***}$; Exp: $z = 2.54^*$; Asp \times Exp: $z = 2.69^{**}$]. Localizations in the present decreased from IPV to PV aspect more strongly with than without STOP-READING (Exp. 2: 77 to 51%; Exp. 1: 81 to 70%), as shown in Figure 1.

2.2.2 Early versus late responses in Experiment 2

Figure 2 shows how valid localizations in time accumulate across the regions of target sentences with IPV (left panel) and PV verb aspect (right panel). Numbers indicate the proportions of localizations in the present within the valid responses, i.e., disregarding continuations. Whereas we recognize no trend for the IPV aspect, it appears that for the PV aspect these proportions remain around 41% until they rise in the last region up to 51% for Response 2. To determine whether the increase is substantial, Response 2 was categorized as Early (if it matched Response 1 given earlier than region 8) or Late (if it matched Response 1 given on region 8 or revised earlier Response 1) and was subjected to a GLMM analysis with the fixed factors Aspect and Time (Early vs. Late). The GLMM converged for random intercepts (participants and items) and random slopes for Aspect (items). In addition to a strong effect of Aspect, Aspect interacted with Time [Asp: $z = 3.61^{***}$; Asp \times Time: $z = 3.40^{***}$]. We take this interaction to show that the proportion of localizations in the present is indeed substantially larger for late compared to early responses in case of a PV aspect (71 vs. 41%; total n : 91 vs. 177); no such

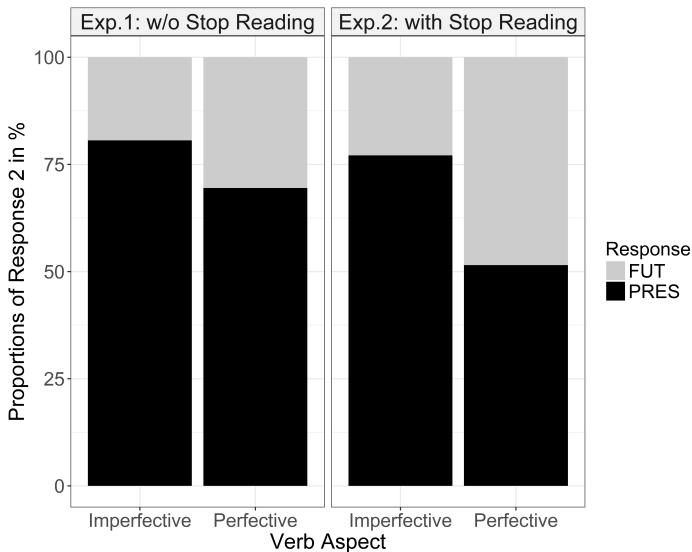


Figure 1: Response 2 (present versus future) in Experiments 1 and 2 as a function of verb aspect

difference is obtained in case of an IPV aspect (74 vs. 78%; total n : 89 vs. 181).

In sum, the results substantiate the claim that the PV aspect on a speech act verb reduces its performative force compared to the IPV aspect, i.e., it reduces the probability that a native speaker interprets the sentence containing it as to perform a speech act. However, the performative force of the verb is often preserved nevertheless, in that speakers frequently interpret the utterance of the sentence as a speech act. In addition, given a PV verb aspect, there is evidence that speakers more likely opt for a speech act interpretation after having processed the uttered sentence as a whole. This claim is supported by much more speech act interpretations in Experiment 1 without STOP-READING than in Experiment 2 with STOP-READING; further evidence comes from Experiment 2 in which speech act interpretations were more frequent if participants read the whole sentence compared to when they stopped reading before the end of the sentence. This might be taken to indicate that the aspect morphology of the sentence initial PV verb is in conflict with a speech act interpretation, with the latter prevailing in particular if based on a full interpretation of the sentence. In line with this, we observe that a valid Response 1 often persists in Response 2 in particular for localizations in the present, 95%, compared to localizations in the future, 82%.

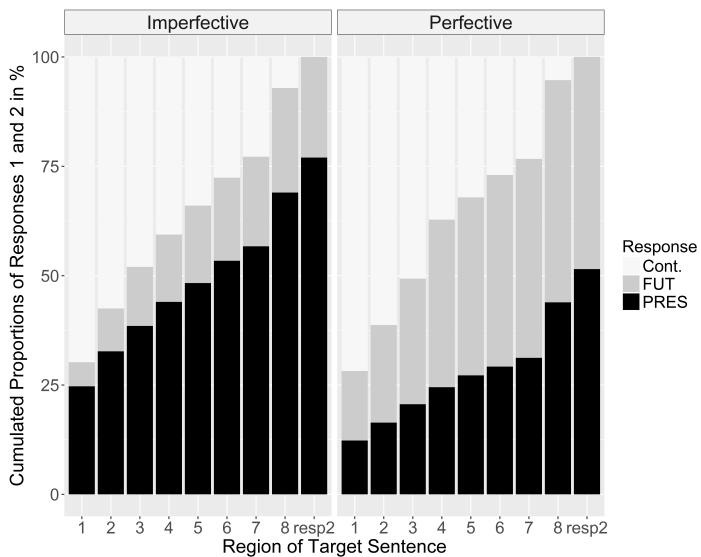


Figure 2: Responses 1 and 2 in Experiment 2 as a function of aspect dependent on sentence position

3 Discussion and outlook

The results of the experiments confirm our hypothesis that PV speech act verbs can be used in performative utterances, and may in principle substitute the IPV speech act verbs. Our investigation does not explain the restrictions of the class of PV verbs that can occur in performative utterances. Like Wiemer (2014) we tend to the opinion that PV performatives are lexicalized to a certain extent. For our investigation the evidence that PV speech act verbs are interpreted as present tense verbs is the most important result. In both experiments taken together about 60% of the PV speech act verbs were interpreted as present perfective. As not all of our speech act verbs were *verba dicendi* (for example ‘to thank’, ‘to invite’, ‘to welcome’, etc.), we may conclude, that not only *verba dicendi* but also other speech act verbs can be used in performative speech acts. Following our hypothesis, we have strong evidence that the present perfective speech act verbs own performative force. This is shown by the frequent present tense localizations of events denoted by our PV speech act verbs. Localization based on the full sentences promoted the localizations of the PV performatives in the present tense. We infer this from the comparison of the two experiments. Moreover, we found a late increase of locations in the present tense in Experiment 2 and a persistence of early local-

izations in the present. Therefore, we conclude that the sentence context plays an important role for the temporal localizations in the case of PV speech act verbs. The verbal aspect is thus not the decisive factor for the well-formedness of performative utterances in Russian. The interpretation as performative is also influenced by the particular semantics of the speech act verbs, the sentence embedding the speech act verb, and maybe the preceding context.

Summing up, we reach the following conclusions, which are in part preliminary and need further support:

First, PV speech act verbs can be used in performative speech acts, because, due to the available present tense interpretation, they fulfill condition ‘present tense’ that is inevitable to carry out a performative speech act. Second, the information conveyed by the sentence information following the PV speech act verb has an influence on the interpretation of the verb if it bears PV but not IPV aspect. Third, given the very low ratings of PV performatives without preceding context (see footnote 5), we suspect that the speech act interpretation also benefits from the preceding context. Evidence for this comes from the fact that the results with PV verbs in Experiment 2 increase in late present localization nearly to the rates for the IPV verbs. In the case of PV speech act verbs, we can even speak of an interaction between the successive enhancement of context information and the localization in the present. The PV speech act verb by itself may be crucial for present localization, but a more reliable localization is reached when the speech act verb is embedded in a wider context. The stronger performative power of the PV aspect in Experiment 1, where the whole speech act appeared before the decision, confirms how the quantity of the sentence information has influence on the decision.

As far as we know, this is the first experimental investigation on aspect use in Russian performatives showing that PV speech act verbs can be used in performative utterances. A next step would be to answer the question, whether and how the use of PV speech act verbs influences the sentence meaning in comparison to IPV speech act verbs. Like Israeli we tend to hypothesize a pragmatic difference between IPV and PV performative utterances; see example (12). It would be interesting to check whether an overt subject even strengthens the marking of authority in performative utterances. Another important consideration is the verbal semantics of IPV and PV speech act verbs. When we argue with Breu (1980) and Dewit 2017, we must also look at the verb immanent aspectual functions in which IPV and PV speech act verbs are different from each other. Following this line of reasoning, IPV speech act verbs would name and perform the performative event, whereas a PV speech act would emphasize the completion of the performa-

tive speech act. Both approaches are well worth pursuing and will give motivate further experimental investigation.

Abbreviations

1	1st person	PL	plural
3	3rd person	PRES	present tense
DAT	dative	PTCL	particle
IPV	imperfective aspect	PV	perfective aspect
NEG	negation	RNC	Russian National Corpus
PAST	past tense	SG	singular

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Chapter 7

The nature(s) of syntactic variation: Evidence from the Serbian/Croatian dialect continuum

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The paper reports on a study of the variation inside the Serbo-Croatian dialect continuum with respect to clitic placement, complements of modal verbs (infinitive/DA+present) and the use of *trebatī* ‘need’ as either an experiencer verb or a simple transitive. Region and ethnicity accounted for a large portion of variation in the use of infinitives and DA+present with many speakers using these structures interchangeably. Next, we found that clitics are almost uniformly placed after the first phrase. The variation in the use of lexical *trebatī* was confined to the Croatian portion of the sample. Our findings suggest that (i) infinitives and DA+present after modal verbs should be treated as roughly the same syntactic structure; (ii) variation in clitic placement should not be analyzed as an instance of sociolinguistic variation and deeper (linguistic) causes of variation should be pursued; (iii) *trebatī* as a transitive verb appears in the Croatian variety only.

Keywords: syntactic variation, Serbo-Croatian dialect continuum, clitic placement, non-finite complements

1 Introduction

1.1 Syntactic variation: Theoretical framework

Recent theoretical approaches to syntactic variation have enabled us to form a more fluid picture of syntax (Adger2006; AdgerTrousdale2007; AdgerSmith2005).

Updates on the rather rigid classical Principles and Parameters theory (ChomskyLasnik1995) like **Kayne2000**'s (**Kayne2000**) Microparametric approach or **Kroch1994**'s (**Kroch1994**) Competing Grammars have struggled with the fact that syntactic variation can be quite free and apparently even optional in some cases. More recently, in line with more general theoretical advances, it has been argued that syntactic variation, with all its apparent fluidity, can be captured within the Minimalist Framework (Adger2006; AdgerTrousdale2007; AdgerSmith2005).

This approach provides us with a way of looking at variation which predicts much greater freedom on the part of speakers to move between two different structures depending on the context. Furthermore, the approach is freed of the assumption that some speakers constantly move from one grammar to another as they produce different constructions.

Instead of relying on parameters and/or microparameters as explanatory mechanisms, Adger and colleagues assume that syntax is simply a set of uniform core operations applied to lexical items. What appears as syntactic variation, thus, arises when (i) there are two or more ways of pronouncing the same structure or (ii) when there are different uninterpretable morphosyntactic features on competing lexical items. **Adger2006** illustrates this with an example of different T heads that can be found in Standard English and dialects like Buckie English and others, which give rise to different spellouts of the auxiliary *be*. While in Standard English, T is sensitive to agreement and spells out the agreement patterns morphophonologically, in non-standard dialects, *be* is either completely insensitive to agreement (i.e. bears no uninterpretable phi-features) or simply does not spell out reflexes of agreement in the same way as in Standard English. Either way, a speaker can have both lexical items (T heads) in their mental lexicon and depending on which one they choose, the output will vary. The way the speaker employs these different lexical items is determined by sociolinguistic factors in the sense of **Labov1972**.

This approach provides us with a way of looking at variation, which predicts much greater freedom on the part of speakers to move between two different structures depending on the context. Furthermore, the approach is freed of the assumption that some speakers constantly move from one grammar to another as they produce different constructions.

The Serbo-Croatian dialect continuum provides very useful testing ground for theories of syntactic variation. Our primary goal in this paper is to present some data from an empirical study of three instances of syntactic variation in this dialect continuum in order to arrive at a clearer factual description of the phenomena at hand. We will also provide sketches of formal analyses of these three structures, which will show that the approach developed by Adger and his co-workers is a very useful theoretical tool when it comes to explaining the observed data.

1.2 Syntactic variation in the Serbian/Croatian dialect continuum

It is a well-known fact that the differences between Serbian and Croatian standard varieties belong mostly to the lexicon and the domain of pronunciation (CorbettBrowne2009; Bailyn2010, *inter alia*). The most prominent differences in the realm of pronunciation have to do with the way in which speakers of these two varieties pronounce words that used to contain the so-called yat sound in the older varieties of the language. In modern Serbian, this sound is pronounced as /e/, while in modern Croatian it is either /je/ or /ije/, depending on the length of the earlier vowel. Based on these different pronunciations, the two standard varieties are also called Ekavian and Ijekavian. In terms of differences in vocabulary items, one can mention that due to historical factors the Croatian variety tended to borrow more from German, Czech and other languages of Central Europe, while Serbian contains more borrowings from Turkish and other languages of the Balkans (CorbettBrowne2009).

Syntactic variation in this dialect continuum seems limited to just a few potential cases. One of the best known points of difference has to do with the structure of non-finite verbal complements. Example (1a) illustrates the option of infinitives functioning as complements of modal verbs while in (1b), the modal is followed by the so-called DA+present structure. Standard grammars of Croatian draw a sharp distinction between the Serbian DA+present option and the Croatian infinitives (Katicic). However, Bailyn2010 provides some empirical evidence to the effect that both varieties allow both options and infinitives are simply more common in Croatian.

- (1) a. Ivan mora **pojesti** večeru.
Ivan must eat.INF dinner
'Ivan must eat his dinner.'
- b. Ivan mora **da pojede** večeru.
Ivan must DA eat.PRES.3SG dinner
'Ivan must eat his dinner.'

Another area of potential syntactic variation would be the positioning of clitics. When it comes to clitics, standard Croatian grammars prescribe placing the clitics after the first word, a rule that is sometimes referred to as the 2W rule (Katicic; for criticism see Peti-Stantic2009). This rule is illustrated in (2b). In Serbian, the most neutral rule is to place the clitics after the first phrase, a rule known as the 2P rule (2a). CorbettBrowne2009 suggest that the 2W rule is less common in

the context of the clitic-second phenomenon because under 2W, the clitic cluster splits a constituent.

- (2) a. Pravi igrač je došao.
true player AUX.CL come
'A true player has come.'
- b. Pravi je igrač došao.
true AUX.CL player come
'A true player has come.'

Regarding the verb *trebati* 'need', we find that Standard Croatian grammars recognize its existence as a transitive verb (3b), while in Serbian, it appears only as an experiencer verb (3a). Also, as a modal verb, in Serbian *trebati* is prescribed as being always impersonal (4b), as opposed to Croatian (4a).

- (3) a. Ivan treba knjigu.
Ivan.NOM need.3SG book.ACC
'Ivan needs (some) cheese'
- b. Ivanu treba knjiga.
Ivan.DAT need.IMP book.NOM
'Ivan needs (some) cheese.'
- (4) a. Deca trebaju otići.
children.NOM.SG need.3PL go.INF
'Children need to go.'
- b. Deca treba / *trebaju da odu.
children.NOM.SG need.IMP need.3PL DA go.3PL
'Children need to go.'

Standard grammars of both Croatian and Serbian often focus on essentially eliminating the variation and prescribing one option as "more natural" for a given variety. Therefore, in a sense, they present an overly rigid either-or, binary picture of variation in these domains.

In order to make sense of the variation in these domains, one needs to have a clear picture of the underlying facts, which we claim are not correctly represented in descriptive grammars. Therefore, the primary aim of this research is to provide some empirical insight into the nature of variation in these three aspects. Next, we will argue that the data point towards the view of variation proposed

by AdgerTrousdale2007 and AdgerSmith2005. Finally, we will suggest ways of analyzing these constructions formally based on the implications that arise from this particular view of variation.

2 Empirical data: Production study

The enumerated instances of potential syntactic variation in the Serbo-Croatian dialect continuum were confirmed by a simple production study.¹ The production task consisted of a written survey that elicited structures like (1)–(3). The non-finite complements of modals were elicited by means of sentences like (5) where the target verb appears in the first part of a compound sentence in its finite form. In the second part of the sentence, the same verb is supposed to appear in its non-finite form after a modal, but a blank is given in its stead. The participants were instructed to fill in the blank with the form of the underlined verb that they found most suitable. They were also instructed not to leave out the verb because those sentences are grammatical even when the verb is elided. There were 20 sentences in total, and the targeted non-finite structures were placed in the contexts of modals *moći* ‘can’, *morati* ‘must’, the phasal verb *početi* ‘start’, and the verb *želeti* ‘want’. Five target sentences were dedicated to each of these contexts.

- (5) Milan je pojeo salatu, a Ivan još mora _____ desert.
 Milan is ate salad, while Ivan still must _____ dessert
 ‘Milan ate the salad while Ivan still has to (eat) the dessert.’

When it comes to the variations in clitic placement, the task was to shift sentences like (6a) into past tense (6b). As can be seen in the examples in (6), the sentence in the present tense does not contain clitics, but in the past tense, the auxiliary clitic *je* ‘is’ is necessary. However, the position of the clitic can be varied as indicated in the example. It can either come immediately after the demonstrative *ta* ‘that’, or it can come after the subject noun phrase *ta gospođa* ‘that lady’, in accordance with 2W or 2P rules respectively. There were 12 target sentences in total and the sentences were organized into four groups according to the type of the prenominal modifier (demonstrative, descriptive adjective, possessive or demonstrative adjective). Each modifier appeared in all three genders (masculine, feminine, neuter).

¹A detailed description of the design, including all the experimental items, can be found at <https://osf.io/m5feh>.

- (6) a. Ta gospođa pravi kolače.
that lady makes cookies
'That lady makes cookies.'
- b. Ta {je} gospođa {je} pravila kolače.
that AUX.CL lady AUX.CL made cookies
'That lady made cookies.'

Finally, the verb *trebati* 'need' was elicited by means of asking a question where the most likely response will be a sentence containing this verb. However, the crucial thing to worry about was avoiding the use of this verb in the question itself because the way the verb is used in the question would have a great impact on how it would be used in the answer. Because this was a written task, it was possible to provide one or two sentences in the way of context and then ask the question like (7a) using a verb other than *trebati*, but also state that the verb *trebati* should be used in the answer.

- (7) a. Šta je još potrebno Petru?
what is else needed.IMP Peter.DAT
'What else does Peter need?'
- b. Petar treba olovku.
Peter.NOM need.3SG pencil.ACC
'Peter needs a pencil.'
- c. Petru treba olovka.
Peter.DAT need.IMP pencil.NOM
'Peter needs a pencil.'

The possible answers to the question in (7a) were either (7b) or (7c). The choice of one over the other would reveal the way the participant uses the verb *trebati* in his or her everyday speech. Because we studied the variation in the use of this one verb only, we had only three target sentences that we wanted to elicit.²

When it comes to the choice of participants, we were interested in the way in which geographic location and ethnicity influenced the use of these constructions. Our sample consisted of 120 participants from Serbia and Croatia, ages

²An anonymous reviewer points out that the presence of a dative argument in the elicitation question could have primed the subjects to also use a dative in the response with the verb *trebati*. This might have reduced the number of transitive uses. The fact that the Zagreb group still largely opted for the transitive *trebati* (as opposed to groups from Serbia) shows that the possible priming effect was not nearly strong enough to suppress the transitive use.

16-19. They were divided into four groups with 30 participants each. One group consisted of 30 students attending the so-called gymnasium school (*gimnazija*) in Zagreb. One group was located in the town of Ruma, roughly 60 kilometers west of Belgrade. This group also consisted of 30 gymnasium students. Finally, there were two groups in the town Subotica, in the north of Serbia, on the border with Hungary. The reason why we had two groups in this town was because in Subotica, there was the option of varying the ethnicity of the participants while controlling for their geographic location. Namely, the gymnasium in this town has a Croatian track alongside the Serbian track. What this means is that students have the option to enroll in classes that are taught in standard Croatian, and a number of ethnic Croats choose this option. In order to vary the ethnicity of the students while controlling for geographic location, we created one group of 30 students from the Croatian track and one group of 30 students from the Serbian track.

It is important to note that our sample was constructed in such a way as to compare the dialect spoken in Zagreb with the dialects spoken in Vojvodina, the Northern Province of Serbia. Zagreb was taken as a benchmark representing a dialect close to the Croatian standard (the participants were students of the Classical Gymnasium in Zagreb, a very prestigious school with a strong focus on languages). Towns in Vojvodina, on the other hand, were of interest to us because they represent the kind of gray area between the Croatian and the Serbian standard where one can zoom in on the speakers who speak neither of the standards but are quite close to both of them at the same time.

Finally, it should be pointed out that this was a pilot study into the vast realm of syntactic variation. We believe, though, that it gives a good starting point towards the understanding of patterns in variation when it comes to the syntactic structures we focused on.

3 Findings

The empirical data that we obtained pointed to quite different patterns of variation in the three structures under investigation. Concerning the variation in non-finite complements, we compared our groups based on the number of infinitives that each participant produced. In Figure 1, mean values for the number of infinitives are given for each group. The results from the groups from Subotica are given in the middle of the graph with *SerbianClass* standing for the group made up of students attending the Serbian track and *CroatianClass* stands for students attending the Croatian track.

As the graph in Figure 1 suggests, there are important differences in the use of

infinitives as non-finite complements across these groups. These differences are statistically significant ($\text{LR } p < 0.01, r^2 = 0.63$). Despite the fact that the group in Zagreb used infinitives almost exclusively, we can conclude that these structures can vary quite freely in the production of a significant number of speakers. The histogram in Figure 2, which shows how the use of infinitives was distributed across the entire sample provides a deeper insight into the nature of the variation in this area.

In Figure 2, the x-axis represents the numbers of infinitives used in the target sentences while the height of the bar shows how many participants who produced a particular number of infinitives there were. As the graph shows, a large portion of the participants either used infinitives throughout, or they systematically avoided them. The height of the bar above zero on x-axis shows the portion of participants who did not use infinitives at all while the height of the bar above 20 on the same axis indicates the share of the subjects who used infinitives only. However, there is also a sizable portion of the sample where these structures are in quite free variation. In other words, for many participants there were no clear preferences for either infinitive or DA+present. A closer look at the surveys done by some of these participants reveals no discernible pattern or context-dependent preference for one of the structures.

When it comes to the variation in clitic placement, we obtained very different results. In our survey, there were 12 target sentences eliciting one or the other clitic placement option. In Figure 3, we plotted the mean numbers of sentences in which 2P rule was observed. The means are given for each of the four groups.

Simply by inspecting the graph visually, one can notice that the pattern of variation was different from what was observed with non-finite complements. The mean values for each of the groups are close to the maximum of 12, and

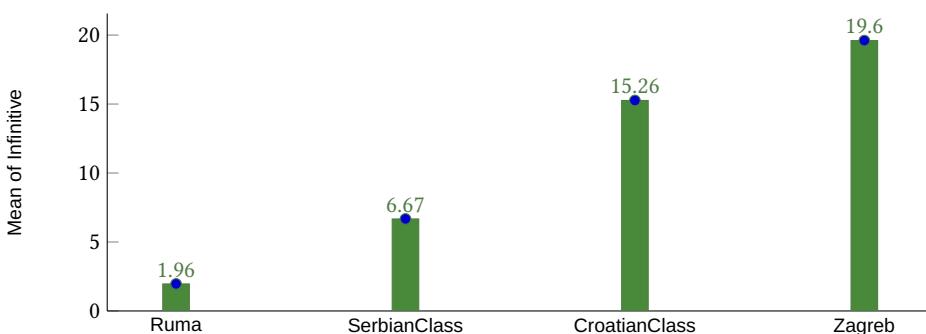


Figure 1: The average number of infinitives across groups

7 The nature(s) of syntactic variation: Evidence from Serbian/Croatian

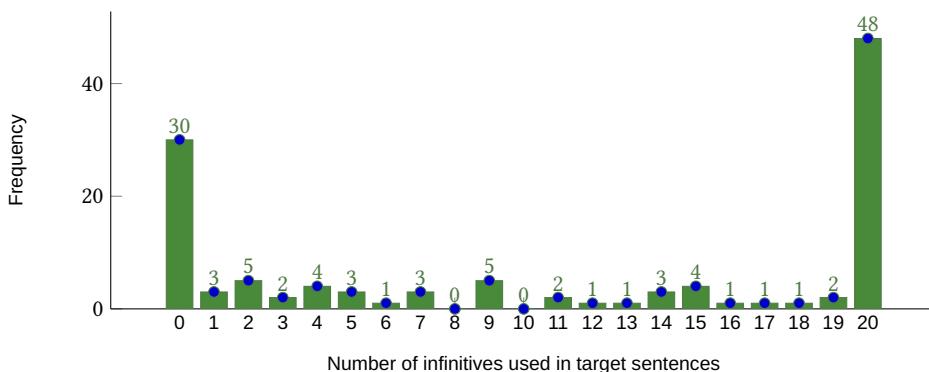


Figure 2: Frequency distribution for the number of infinitives in the entire sample

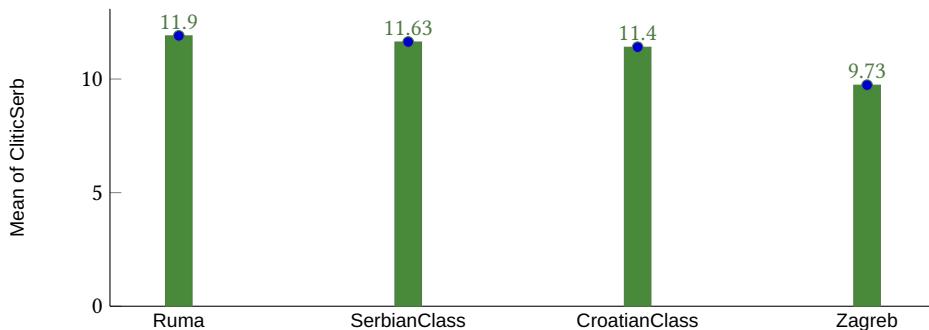


Figure 3: The average number of applications of 2P rule across groups

Linear Regression found no statistical difference among the groups ($p = 0.205$, $r^2 = 0.0136$). A more detailed look at the surveys reveals that a very small number of participants did produce several instances of the 2W rule, but these were rather marginal as the preponderance of participants in all four groups used the 2P rule only.

Turning now to the variation in the use of the verb *trebati*, we can say that whatever variation there is in the use of this verb, it is confined to the Croatian variety. All the participants from Serbia (both groups from Subotica and the group from Ruma), used this verb in its experiencer-like form. There were no instances of this verb used as a simple transitive in these three groups. On the other hand, we found that there is substantial variation in the use of this verb within the group from Zagreb. About a third of the elicited utterances containing the verb *trebati* where characterized by the simple transitive use (the mean value

was 1.06 with 3 being the maximum). Curiously, it was not the case that out of 30 participants approximately a third used *trebatī* as a transitive verb exclusively and the remaining 20 participants used this verb only in its experiencer version. The instances of *trebatī* as a transitive verb were much more distributed within the group with some speakers using this verb two times as an experiencer verb and once as a transitive one. Of course, there were also those who produced two sentences with a transitive *trebatī* and one with its experiencer-like counterpart. Crucially, the outcome was that, in fact, only less than a third of the participants from Zagreb consistently used *trebatī* as an experiencer verb with no instances of its transitive version.

4 Analysis

Armed with these empirical insights about the patterns of variation with these three constructions, we can turn to the question of what these insights can tell us about their underlying structure. Also, we might be able to derive some suggestions as to the broader theoretical questions dealing with the nature of syntactic variation hinted at in the introduction. These will be the topics of this section.

4.1 Infinitive vs. DA+present

On a general note, one can say that the DA+present construction has received much more attention in the syntactic literature than infinitives (Todorovic2012; Miseska-Tomic2004). The fact that these two structures can be found in virtually free variation is rarely addressed (see Belic2005 for exceptions). TodorovicWurmbrand2015 note that the *da* particle found in DA+present constructions can function as a complementizer (8), a modality marker (9) and finiteness marker on *v* (10).

- (8) Jovan je tvrdio da čita knjigu.
Jovan AUX.3SG claimed DA read.PRES.3SG book
'Jovan claimed to be reading the book.'

(from TodorovicWurmbrand2015)

- (9) Jovan je odlučio da spava u garaži.
Jovan AUX.3SG decided DA sleep.PRES.3SG in garage
'Jovan decided to sleep / that he would sleep in the garage.'

(based on TodorovicWurmbrand2015)

- (10) Marko je počeo da radi zadatak.
 Marko AUX.3SG started DA do.PRES.3SG homework
 'Marko started doing his homework.'

Even though under certain conditions (9) would also allow an infinitive after the main verb, our study focused on structures like (10), where infinitive alternates with DA+present most clearly.³ TodorovicWurmbrand2015 treat infinitives as bare VPs based on the fact that they seem to be unable to assign accusative case, typically associated with the causative *v*. That way, they postulate a syntactic difference between these two structures because sentences like (10) contain a full vP at least. Under their account sentences like (11), where infinitive is used as the complement of the phasal verb, should have a bare VP in the embedded part. They claim that the accusative case on the object of the infinitive is assigned by the matrix verb.

- (11) Marko je počeo raditi zadatak.
 Marko AUX.3SG started do.INF homework
 'Marko started doing his homework.'

However, because the data illustrate the possibility of completely free variation, we will propose that both "low-DA", corresponding to (10), and infinitives have the same structure: both are vPs.⁴ If infinitives and DA+present were truly different structures, one would not expect to find speakers who use them interchangeably, as we did. A deeper structural difference of the vP / VP kind would give rise to clear preferences for one structure over the other either across regional varieties or, at the very least, across individual speakers.

There also might be some syntactic evidence against the claim that infinitives are merely VPs. The main piece of evidence is the availability of accusative case with infinitives in contexts where it is difficult to argue that the accusative is assigned by the matrix verb: copular constructions (12) and impersonals (13). If

³Example (8) does not allow the alternation with infinitives, while the tense of the embedded clause can be varied, and the reference of the subject of the embedded clause is not tied to the reference of the matrix clause subject. Sentences like (9) allow infinitives and DA+present after the main verb only if the subjects of the matrix structure and the embedded structure are (referentially) the same. Having a (referentially) different subject is possible, but with DA+present only. Sentences like (10) never allow referentially different subjects in the embedded and the matrix part. We leave the variation of infinitives and DA+present in sentences like (9) for further research.

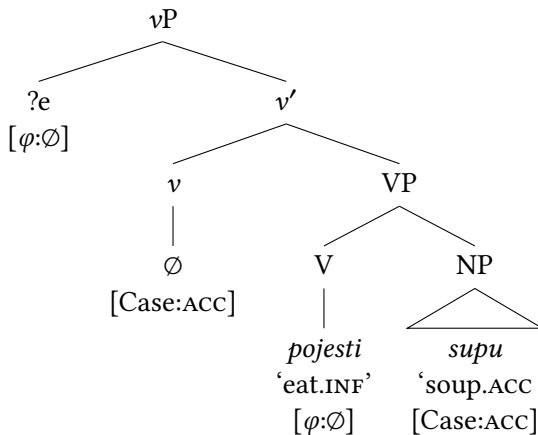
⁴By using the term "free variation", we refer to structural alternations that have no consequences for the semantics and pragmatics of the sentence a whole.

the ability to assign accusative is taken as a diagnostic, we should conclude that infinitives, like the “low-DA” structures are vPs.

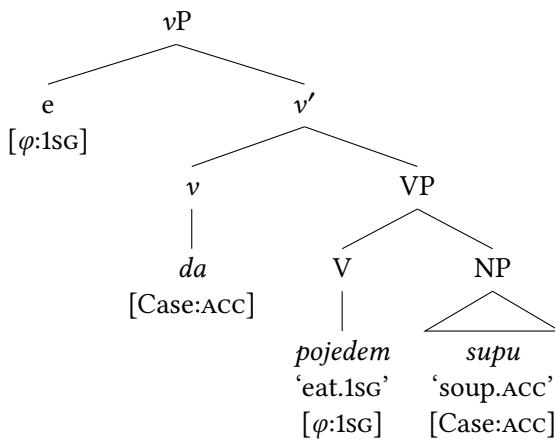
- (12) Položiti matematiku je teško.
 pass.INF math.ACC is difficult
 ‘It is difficult to pass the math exam.’
- (13) Trebalо je pojesti supu.
 needed.3SG.N AUX.3SG eat.INF soup.ACC
 ‘One was supposed to eat soup.’

Once both infinitives and DA+present are reduced to essentially the same structure (i.e. vP), we can look at them as simply different instantiations of the same v^0 . The proposed structures for infinitives and DA+present are in (14).

- (14) a. Infinitive



- b. DA+present



If infinitives and DA+present are merely different instances of the same v^0 , we can expect the kind of variation that we observed in our study. In line with the general view in AdgerSmith2005, we can assume that there are some speakers whose mental lexicons contain both of these v heads, which is why they can use them interchangeably.

The structures in (14) raise one additional problem. Namely, it is unclear what the status of the embedded subject with infinitives and DA+present should be. Although both DA+present and infinitives are subject to the same constraints regarding the interpretation of the null subject (obligatory control, sloppy reading only, etc.), in impersonal constructions, we note a clear asymmetry with respect to the impersonal (reflexive) morpheme *se*. With DA+present, *se* (and in fact all kinds of pronominal clitics) obligatorily stays inside the vP , whereas with infinitives, it shows up with the matrix verb; see (14).

- (15) a. Moglo je da se peva.
can.PAST.3SG.N AUX.3SG DA REFL sing.3SG
'It was possible to sing.'
- b. * Juče se moglo da peva.
yesterday REFL can.PAST.3SG DA sing.3SG
Intended: 'It was possible to sing yesterday.'
- c. Moglo se pevati.
can.PAST.3SG.N REFL sing.INF
'It was possible to sing.'

While the behavior of *se* with DA+present supports our assumption for the existence of a null element in Spec vP (which needs to be targeted/"switched off" by

se impersonalization), the fact that *se* surpasses the infinitive predicate poses a problem for the uniform structural treatment of the infinitive and DA+present, and brings into the question the postulation of the vP layer in infinitives.⁵ It is also possible that infinitives simply lack SpecvP, which would still retain structural uniformity.

Wurmbrand (2003) and Todorovic Wurmbrand 2015 argue that there is no PRO with (restructuring) infinitives, i.e. that infinitives lack a syntactic subject altogether, and that interpretation comes from the matrix subject. However, a simpler way of capturing the relevant facts would be by postulating a difference in terms of the presence/absence of SpecvP rather than saying that infinitives lack the vP layer completely. Again, saying that there is no vP with infinitives would leave sentences like (12) and (13) unexplained.

Impersonal contexts again provide us with evidence that the interpretation of the external argument of the infinitive is dependent on interpretation of the matrix predicate subject. Namely, infinitives are only possible with impersonal *se*. If *se* is absent, as in (15), only predicates without a referential subject (e.g. weather verbs, such as *grmeti* ‘thunder’ in (17c)) are possible.⁶ No such restrictions hold for DA+present (17b), where *se* obviously takes care of getting the proper interpretation for the embedded predicate (indefinite, human).

- (16) a. * Moralo / Moglo je pevati.
must.PAST.N can.PAST.N AUX.3SG sing.3INF
Intended: ‘One had to / could sing.’
- b. Moralo / Moglo je da se peva.
must.PAST.N can.PAST.N AUX.3SG DA SE sing.3SG
‘One had to / could sing.’
- c. Moralo / Moglo je grmeti.
must.PAST.N can.PAST.N AUX.3SG thunder
‘There must / could have been thunder.’

Curiously, copular constructions and impersonal *trebati* ‘need’, which also lack an overt matrix subject, show no restrictions with respect to the infinitive (cf. (12) and (13)). It is possible that in these contexts we are dealing with what Wurmbrand (2003) calls “non-restructuring” configurations. These configurations would then be vP infinitives, which are different from the restructuring (VP) ones found after modals and verbs such as *try* or *begin*. At this point, we cannot provide

⁵Krapova 1999’s (Krapova 1999) analysis of a structure virtually identical to DA+present also assumes the existence of PRO in those contexts.

⁶Presumably, the subject of these matrix predicates is a kind of expletive *pro*.

a definitive resolution of this issue. The crucial test for a true case of restructuring is the availability of long passive. However, long passive in Serbian is possible only with impersonal SE-passive (cf. TodorovicWurmbrand2015), while BE-passive is not allowed in these constructions. The examples in (16) show the unavailability of long BE-passive, see (17a) and (17b), with both infinitive and DA+present complements together with the acceptable SE-passive versions.

- (17) a. * Ta pesma **je započeta** da se svira. BE-passive
 that song.F is started.PASS.PTCP.F DA REFL play.3SG
 Intended: ‘They started to play that song.’
- a'. Ta pesma **se započela** svirati. SE-passive
 that song.F REFL started.PAST.PTCP.F play.INF
 ‘They started to play that song.’
- b. * Ta pesma **je započeta** svirati. BE-passive
 that song.F is started.PASS.PTCP.F play.INF
 Intended: ‘They started to play that song.’
- b'. Ta pesma **je započela** da se svira. SE-passive
 that song.F is started.PAST.PTCP.F DA REFL play.3SG
 ‘They started to play that song.’

We leave open the question of obligatory control and whether the “PRO interpretation” of the infinitive requires a syntactic position or not.

It should be noted that some speakers report subtle differences in meanings of these two constructions. Examples like (17) illustrate some of these subtle differences. For speakers from central Serbia, these examples can mean simply negated future. For many speakers from Vojvodina, however, these sentences mean the lack of volition with both present and future temporal reference. These speakers prefer to use the infinitive for the meaning of negated future.

- (18) Mi nećemo to da radimo.
 we NEG.will.1PL that DA do.1PL
 ‘We will not do that.’

In sum, once we assume that DA+present and infinitive are two versions of the same *v* head, it becomes possible to explain the variation between the two as a consequence of the roughly equal availability of these two heads in the mental lexicons of such speakers. Also, the reason why some speakers consistently use one and never the other would be because their mental lexicon contains only

one variety. At this point, the suggestion is to treat them as the same underlying structure.

4.2 Clitics

Concerning the difference between the 2W and 2P rules in the placement of clitics, one can identify two approaches. In one of the views, these two options are the same in terms of their underlying form (Ronelle2006; Ronelle2008; Yu2008). The difference, then, stems from the application of two different phonological processes, one of which inserts the clitics after the first word while the other one inserts the clitics after the first phrase. Crucially, these phonological processes apply differently across the dialect continuum. The difference, thus, seems to be understood to be purely sociolinguistic. Anderson2005, surprisingly, even suggests that the use of 2W rule is not possible in Serbian, where only the 2P rule can be found.

Other authors argue that this difference is not purely sociolinguistic in nature. For instance, DiesingEtAl2009 argue that sentences in which the 2W rule is used have a marked pitch contour, which suggests prosodic focus on the prenominal modifier. Moreover, such sentences are claimed to be felicitous only in contexts where the prenominal modifier is contrastively focused. The 2P rule, on the other hand, is applicable to broad focus contexts and is, thus, interpreted as unmarked. Bošković (2009) proposes different syntactic derivations for the two rules. In his view, the 2W rule is derived by left-branch extraction of the prenominal modifier which then functions as an anchor for the clitic. Our own intuitions suggest that answers like (18b), where the 2W rule is applied, are not necessarily infelicitous in response to questions like (18a), which are a clear indication of a broad focus situation.

- (19) a. Šta se desilo?
what REFL happened
'What happened?'
b. Onaj je čovek došao kasno.
that AUX.CL man come late
'That man came late.'

In that sense, we do not agree with the restrictive differentiation given by DiesingEtAl2009 although we think that at least in the Serbian variety, the 2W rule carries some additional pragmatic or semantic cues. Crucially, these additional meanings should not be interpreted in terms of contrastive focus.

The results that we obtained in the study clearly point towards the approach taken by this second group of authors who disagree with the idea that the difference between 2W and 2P is merely sociolinguistic. If that were the case, we would see a clear pattern of difference in the number of instances of the 2W rule among our four groups similar to what we observed with infinitives and DA+present. However, the results show no statistical significance in the way in which clitics are placed within the sample. Virtually all participants opted for the 2P rule. This would not come as a surprise to those who claim that 2W and 2P sentences are different in terms of their syntax (Bošković 2009) and/or semantics and pragmatics (DiesingEtAl2009). The reason why the results are not surprising under the second set of accounts is because our sentences were given without additional contextual information, which would be needed to elicit 2W sentences.

4.3 The verb *trebatī* ‘need’

Our data show very clearly that the variation between transitive and experiencer *trebatī* ‘need’ is confined to the Croatian variety. What is more, ethnicity does not play a major role in the use of this verb. This was shown by the fact that there were no instances of *trebatī* as a transitive verb in the ethnically Croatian group from Northern Serbia. In that sense, variation is determined by regional factors.

As transitive *trebatī* never occurs in Serbian, the simplest assumption then is that many Croatian speakers have two different lexical items, which some of them may use interchangeably, which is again in line with the approach to variation adopted here. However, before we dismiss the variation with *trebatī* as uninteresting and too straightforward, we need to point out the change we note with the modal *trebatī* in Serbian. Even though standard/prescriptive grammars and practices go to great lengths to preserve its special status as the only modal which can occur only as an impersonal, the speakers of Serbian show more and more agreeing patterns, whereby *trebatī* agrees with the fronted (topicalized or focalized) embedded subject.

- (20) a. **Trebalo je** [da devojke otpevaju tu pesmu].
needed.SG.N AUX.3SG DA girls.PL.F sing.3PL that song
'It was needed / necessary that girls sing this song.' / 'Girls should have sung this song.'
- b. **Devojke₁ je trebalo** [da t₁ otpevaju tu pesmu].
girls.PL.F AUX.3SG needed.SG.N DA sing.3PL that song
'Girls should have sung this song.'

- c. Devojke₁ su **trebale** [da t₁ otpевају ту песму].
girl.PL.F AUX.PL needed.PL.F DA sing.3PL that song
'Girls should have sung this song.'

The source of variation in these examples is very interesting because it might be linked to the similarities and differences in the structure of infinitives and DA+present complements discussed in this paper. Namely, the Croatian equivalent of (19a) is (20) where the modal *trebati* has to agree with the subject.

- (21) Djevojke su **trebale** otpjevati tu pjesmu.
girl.PL.F AUX.PL needed.PL.F sing.IMP that song
'It was needed / necessary that girls sing this song.' / 'Girls should have sung this song.'

The infinitival complement in (20) is incapable of hosting an overt subject and, as TodorovicWurmbrand2015 argue, it is quite possible that they do not even project a syntactic position capable of hosting a subject. Therefore, in Croatian, the subject would have to be base generated with *trebati*, which is why we observe agreement on the modal. On the other hand, DA+present complements always project a SpecVP position, which is sometimes occupied by PRO and sometimes it hosts an overt subject. In (19a), for instance, we find an overt subject with DA+present, hence, the modal *trebati* is impersonal. However, if DA+present and infinitives are in the process of becoming the same structure, as we argued here, the system is forced to accommodate, which is why we are observing the development of a personal use of the previously impersonal modal *trebati*. Based on these facts, we could speculate that the development of a transitive use of the lexical verb *trebati* is linked to this difference in the modal use, but further research is needed to establish this relationship more firmly.

5 Conclusions

In conclusion, we have provided empirical evidence that some speakers belonging to the Serbian/Croatian dialect continuum can alternate between infinitives and DA+present constructions without any restrictions even in a written production task. This fact was taken to mean that these are the same underlying structures. Additional syntactic evidence pointing to the same conclusion was also provided. We left open the question of the existence of an active SpecVP position with infinitives as we found some suggestions that the nature of the embedded subject with infinitives and DA+present might be different in certain respects.

A different pattern of variation was found with respect to 2W and 2P clitics. Namely, previous accounts that tie the difference between 2W and 2P clitics to sociolinguistic considerations would predict sharp differences among the four groups of participants in our sample in terms of the use of these two rules for clitic placement. However, such differences were not observed and virtually all participants used the 2P rule exclusively.

Finally, variation in the use of the verb *trebati* as an experiencer verb and as a simple transitive was observed only within the group in Zagreb. No instances of this verb used as a simple transitive have been observed in the groups from Serbia, including the group made up of students with the Croatian ethnic background. In this domain, variation is determined by regional rather than ethnic factors. Also, many speakers who produced sentences with *trebati* as a transitive verb used it as an experiencer verb as well. We have suggested that there are two competing lexical entries for the verb *trebati*, one specified as a transitive verb and the other specified as an experiencer verb, in the mental lexicons of many speakers of Croatian.

The results obtained show a high degree of flexibility in the use of certain syntactic structures like DA+present and infinitives. A significant share of the participants in the study used these structures interchangeably in a controlled production study (i.e. a fixed sociolinguistic context) without any obvious consequences for the semantics and pragmatics of the resulting output. Such a high degree of flexibility is surprising under traditional approaches to syntactic variation where different output structures are expected to arise from different sociolinguistic contexts and/or have different meanings. On the other hand, Adger2006's (Adger2006) approach creates a much more fluid picture where certain speakers are expected to use different structures interchangeably often without any consequences for the meaning and speaker's decision to use one structure instead of the other is not necessarily triggered by a change in the sociolinguistic context. Since this is precisely what we found with respect to the use of infinitives and DA+present in many speakers of Serbo-Croatian, broader theoretical implications of this study can be found in the fact that it fits into this more fluid picture of syntactic variation proposed by Adger2006.

Abbreviations

1	first person	INF	infinitive
3	third person	LR	linear regression
2P	second phrase	NOM	nominative
2W	second word	PASS	passive
ACC	accusative	PL	plural
AUX	auxiliary	PRES	present
CL	clitic	PTCP	participle
DAT	dative	REFL	reflexive
F	feminine	SG	singular
IMP	impersonal		

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Chapter 8

On the lack of φ -feature resolution in DP coordinations: Evidence from Czech

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The paper investigates a feature valuation in the context of more than one accessible goal. Concretely, the paper provides novel empirical evidence that there is no φ -feature resolution in syntactic agree. The apparent feature resolution of GENDER and NUMBER agreement previously reported in the Slavic literature on agreement with coordinated DPs is a side-effect of morphological realization of PERSON feature that arises at the syntax–semantics interface. Furthermore, the proposal suggests that even non-default overt morphological marking of agreement might not faithfully reflect the narrow-syntax feature valuation, a result which seriously questions the validity of some core generalizations about agreement properties of natural languages. The core data comes from the agreement with coordinated noun phrases in Czech.

Keywords: agree, multiple agree, feature resolution, pronouns, copular clauses, Czech

1 Introduction

The Minimalist Program (Chomsky 1995) shifted the focus of the syntactic investigation from lexical categories to their feature composition, which in turn yielded a growing interest in relations among syntactic features themselves, specifically, the notion of agree (chomsky2000; Chomsky 2001; among others). More recently the debate has increasingly concentrated on the status of valued and unvalued features (pestorrego07) and the notion of feature valuation in and of itself. This paper addresses the question of whether syntactic agree can only copy and share existing values of features, or whether narrow syntax can derive new values of syntactic features.

The question does not directly arise in the work that investigates structures with a single accessible goal. There the focus is on the distinction of matching and valuation ([bejarrezac03](#), [pestorrego07](#)) and the question of infallibility of these operations (e.g., the notion of failed agree in [Preminger 2009](#)). The question becomes more intricate in the domain of investigation of syntactic structures with more than one accessible goal. While for the work on Multiple-Agree ([Hiraiwa 2005](#)), it is critical that feature values within the same agree link *must match*, the literature on agreement with coordinated DPs works instead with the assumption that narrow syntax *may derive* new values by combining conflicting feature values within an agree link ([Farkaš & Zec 1995](#); [King & Dalrymple 2004](#); [Heycock & Zamparelli 2005](#); [Marušić et al. 2015](#)).¹

The paper provides novel empirical evidence that there is no φ -feature resolution in syntactic agree. The apparent feature resolution of GENDER and NUMBER agreement previously reported in the literature is a side-effect of morphological realization of PERSON feature that arises at the syntax-semantics interface. Furthermore, the proposal suggests that even non-default overt morphological marking of agreement might not faithfully reflect the narrow-syntax feature valuation, a result which seriously questions the validity of some core generalizations about agreement properties of natural languages. The core data comes from the agreement with coordinated noun phrases in Czech.

2 Feature resolution in the Czech agreement system

Standard Czech² distinguishes three grammatical genders, i.e., masculine (M), feminine (F), neuter (N), and two grammatical numbers, i.e., singular SG, plural PL. In addition, masculine gender is marked for animacy, i.e., there is a specialized case and agreement marking for animate (MA) and inanimate (MI) masculine nouns and the elements that morphosyntactically agree with them. While the ultimately four-way distinction is fully preserved in singular agreement and case marking, there is a partial syncretism in plural. The system distinctly marks neuter plural and masculine animate plural but collapses the distinction between mascu-

¹The existing approaches to agreement with coordinations range from strictly morpho-syntactic, as in [Marušić et al. \(2015\)](#), to strictly semantic, as in [Lasersohn \(1995\)](#). A majority of the current approaches combines both morpho-syntactic and semantic derivation, as pioneered in [Farkaš & Zec \(1995\)](#).

²I use the label Standard Czech for a non-vernacular variety of an interdialect shared by most native speakers of Czech and based on the modern codified standard of the Czech language.

line inanimate and feminine.^{3,4} The richness of the morphological marking thus lends itself easily to investigating agreement with coordinated noun phrases.

According to the existing grammatical descriptions (e.g., [Panovová & Petkevič 1997](#)), if nominal conjuncts differ in their φ -features, the agreement with both conjuncts is resolved along a markedness hierarchy, sensitive to animacy and gender marking.⁵ Thus, animate masculine is the most marked feature, with masculine inanimate and feminine ranked over neuter. This means that if one of the conjuncts is masculine animate, the plural agreement is going to be masculine animate, as shown in (2).⁶ If there is no masculine animate noun but one of the conjuncts is masculine inanimate or feminine, the plural agreement is the syncretic masculine inanimate/feminine agreement, as shown in (3). The order of the conjuncts does not affect the agreement pattern.⁷ For simplicity of the presentation, I refer to the former agreement pattern as ANIMATE AGREEMENT and the latter one as GENDER AGREEMENT.

(1) **Feature-resolution markedness**

animacy (MA) > gender (MI/F) > neuter (N)

(2) **animacy (MA) > gender (MI/F)/neuter (N)**

a. {Kočka / kotě / dobytek} a pes jedli ze
cat.F.SG kitten.N.SG cattle.MI.SG and dog.MA ate.PP.MA.PL from
stejné misky.
same bowl

‘The cat/kitten/cattle and the dog ate from the same bowl.’

F/N/MI + MA = MA (ANIMATE)

³The fact that feminine is collapsed with masculine inanimate in and of itself provides a strong indication that animacy plays no role in the syntactic construal of the feminine value of the gender feature.

⁴The syncretism pattern plays out somewhat differently in dialects, see, e.g., [KarlikEtAl:2002](#), for morphological features that distinguishes Bohemian dialects from their Moravian counterparts (Central and Eastern Moravian). Discussing the dialectal variation goes beyond the scope of this paper but a preliminary exploration is attempted in section 5.

⁵Czech allows both first-conjunct agreement and agreement with both conjuncts. For now I leave the first-conjunct agreement pattern aside as it does not directly inform the empirical description of the feature resolution.

⁶Data with simple agreement patterns are based on my native speaker intuitions and existing grammar descriptions (primarily, [corbett83](#); [Panovová & Petkevič 1997](#)). Data testing for combinations of features are based on elicitation of grammatical judgements from 4–6 native speakers.

⁷The (b) orders tend to be judged as less natural, a fact related to the asymmetric nature of coordinated noun phrases (see, e.g., [Johannessen 1996](#)), unless the ordering becomes relevant.

- b. Pes a {kočka / kotě / dobytek} jedli ze
dog.MA and cat.F.SG kitten.N.SG cattle.MI.SG ate.PP.MA.PL from
stejné misky.
same bowl

'The dog and the cat/kitten ate from the same bowl.'

$$\boxed{F/N/MI + MA = MA \text{ (ANIMATE)}}$$

(3) gender (MI/F) > neuter (N)

- a. Kotě a {kočka / dobytek} jedly ze stejné
kitten.N.SG and cat.F.SG cattle.MI.SG ate.PP.{MI/F}.PL from same
misky.
bowl

'The kitten and the cat/cattle ate from the same bowl.'

$$\boxed{N + MI/F = \{MI/F\} \text{ (GENDER)}}$$

- b. {Kočka / dobytek} a kotě jedly ze stejné
cat.F.SG cattle.MI.SG and kitten.N.SG ate.PP.{MI/F}.PL from same
misky.
bowl

'The cat/cattle and the kitten ate from the same bowl.'

$$\boxed{N + MI/F = \{MI/F\} \text{ (GENDER)}}$$

Upon a closer examination the markedness behaviour is rather puzzling. In other domains that involve a feature resolution along the markedness hierarchy, if there is a conflict, the system resorts to the less marked feature. This is not the case here. Not only does the masculine animate systematically emerge as the winner even though in other domains it is morphologically the most marked feature, neuter that in other environment behaves as the morphologically least marked feature, e.g., the feature used in failed-agree environments with no syntactic probe, as in (4), never survives in coordination agreement patterns.

- (4) a. Pršelo.
rained.PP.N.SG
'It rained.'
- b. Že Petr nepřišel, nebylo dobré.
that Peter NEG.came NEG.was.PP.N.SG good.N.SG
'That Peter didn't come wasn't good.'

One could argue that neuter cannot participate in a syntactic resolution because it is in some sense defective. Such a conclusion goes in line with the following observation. Not only does neuter never win in a combination with other gender values, but neuter-plural agreement arises only if both conjuncts are in neuter plural, as shown in (5). If either or both of the conjuncts are in neuter singular, the plural agreement cannot be in neuter plural, despite the fact there is a dedicated neuter plural agreement morphology. Instead, the agreement is the syncretic gender agreement.

- (5) a. Kotě a štěně {jedly / *jedla} ze stejné misky.
 kitten.N.SG and puppy.N.SG ate.PP.{MI/F}.PL PP.N.PL from same bowl

‘The kitten and the puppy ate from the same bowl.’

$$\boxed{\text{N.SG} + \text{N.SG} = \{\text{MI/F}\} (\text{GENDER})}$$

- b. Kočata a štěně {jedly / *jedla} ze stejné misky.
 kittens.N.PL and puppy.N.SG ate.PP.{MI/F}.PL PP.N.PL from same bowl

‘The kittens and the puppy ate from the same bowl.’

$$\boxed{\text{N.PL} + \text{N.SG} = \{\text{MI/F}\} (\text{GENDER})}$$

- c. Kočata a štěňata jedla ze stejně misky.
 kittens.N.PL and puppies.N.PL ate.PP.N.PL from same bowl
 ‘The kittens and the puppies ate from the same bowl.’

$$\boxed{\text{N.PL} + \text{N.PL} = \text{N.PL}}$$

The question of why animate masculine should behave as if it were less marked than inanimate masculine remains. The overall agreement-resolution pattern is summarized in Table 1.⁸

⁸For Panevová & Petkevič (1997), the plural agreement for the first conjunct being MI is MI. Since there is no empirical evidence that MI.PL and F.PL are distinct, I use the descriptive MI/F label instead. The same for the first conjunct being F.

Table 1: Agreement-resolution patterns (adapted from Panevová & Petkevič 1997)

1st conjunct	2nd conjunct	plural agreement
MA	α	MA, where $\alpha \in \{\text{MA, MI, F, N}\}$
MI	α	MI/F, where $\alpha \in \{\text{MI, F, N}\}$
F	α	MI/F, where $\alpha \in \{\text{F, N}\}$
N.SG	N.SG	MI/F
N.SG	N.PL	MI/F
N.PL	N.PL	N

3 The puzzle: Different probe = different feature resolution

One could dismiss the emergence of the masculine animate plural agreement as insignificant, if it was not for an additional and much more serious empirical problem. The generalizations reported in the literature are strictly based on examples in the past tense. The past tense in Czech is morphologically realized by a finite auxiliary that agrees in person and number and is null for 3rd person and a past participle that agrees in number and gender with a structural subject in nominative case. Strikingly, the feature-resolution generalization reported in the previous section does not extend to other constructions in which we see plural agreement in gender, i.e., agreement with adjectival predicates and passive participles.

Agreement with adjectival predicates and passive participles plays out rather differently. As it turns out, if the gender features on conjuncts do not match, plural agreement is fully grammatical only if one conjunct is masculine animate and the other conjunct is grammatically feminine but may be semantically construed as animate, as in (6).⁹

- (6) a. Petr a Pavla byli unavení.
 Petr.MA.SG and Pavla.F.SG were.PP.MA.PL tired.PP.MA.PL
 ‘Petr and Pavla were tired.’

⁹The consistency of masculine animate agreement in these patterns have been confirmed in Adam:2017, a large scale ($N = 103$) elicitation study testing some of the data from an unpublished version of this paper. Adam tested only animate coordinations and confirmed that whenever one of the conjuncts is masculine animate, plural agreement is masculine animate, irrespective of the order of the conjuncts.

- b. Pes a kočka byli unavení.
 dog.MA.SG and cat.F.SG were.PP.MA.PL tired.PP.MA.PL
 ‘The dog and the cat were tired.’

$$\boxed{\text{MA} + \text{F} = \text{MA} (\text{ANIMATE})}$$

If there is no masculine animate gender, grammatically inanimate gender combinations are strongly degraded even if they semantically denote animate objects. When the coordination contains an inanimate masculine noun and a neuter, the expected agreement, i.e., masculine inanimate (syncretic with feminine plural), is strongly degraded, (7). Speakers I tested strongly preferred colloquial morphology (Common Czech), which is completely syncretic in plural, i.e., no gender or animacy distinction is preserved in the system (e.g., KarlikEtAl:2002), (8).

- (7) ?? Dobyték a kotě byly unavené.
 cattle.MI.SG and kitten.N.SG were.PP.F/MI.PL

‘The cattle and the kitten were tired.’ $\boxed{\text{MI} + \text{N} = ??\{\text{MI/F}\} (\text{GENDER})}$

- (8) Dobyték a kotě byly unavený.
 cattle.MI.SG and kitten.N.SG were.PP.PL tired.PP.PL
 ‘The cattle and the kitten were tired.’

As for the combination of feminine and neuter, no agreement pattern is fully acceptable either. In a forced written elicitation task reported in Adam:2017, speakers volunteered feminine plural (62%), i.e., the prescriptively required agreement, neuter plural (about 26%), i.e., syncretic plural in some dialects, or colloquial morphology (12%), i.e., fully syncretic agreement, (9). In my original data collection which was based on a spoken elicitation and a grammatical judgement task, speakers found the colloquial ending most acceptable.¹⁰

- (9) ?? Kočka a kotě byly unavené / unavená /
 cat.F.SG and kitten.N.SG were.PP.F.PL tired.PP.F.PL tired.PP.N.PL
 unavený.
 tired.PP.COLLOQ-PL

‘The cat and the kitten were tired.’ $\boxed{\text{F} + \text{N} = ??\text{F/N/COLLOQ} (\text{GENDER})}$

¹⁰Adam:2017’s study was based on data reported in the 2017 manuscript version of this paper. The judgements reported here thus reflect her finding. Adam:2017 didn’t test any of the other feature combinations as her focus was on animate agreement and agreement with numerals.

Strikingly, when speakers are inquired about a combination of masculine animate and neuter gender, irrespective of the number of the conjuncts, as in (10), they try to avoid the agreement altogether. The switch to the fully syncretic colloquial morphology improves the ratings but not as well as in (8). I label this class of avoidant judgements as agreement gaps and mark them with ⊖.

- (10) a. ⊖ Pes a kotě byli ??{unavené / unavení
dog.MA.SG and kitten.N.SG were.MA.PL tired.PP.MI/F.PL PP.MA.PL
/ unavená}.
PP.N.PL

Intended: ‘The dog and the kitten were tired.’

MA.SG + N = ⊖

- b. ⊖ Psi a koťata byli ??{unavené / unavení
dogs.MA.PL and kitten.N.SG were.MA.PL tired.PP.MI/F.PL PP.MA.PL
/ unavená}.
PP.N.PL

Intended: ‘The dogs and the kittens were tired.’

MA.PL + N.PL = ⊖

Recall that the past-tense pattern was not fully syncretic, yet the feature resolution was always possible.¹¹ Furthermore, if indeed some form of morphological syncretism is in place, then the resolution pattern cannot be attributed to a narrow-syntax valuation as suggested in the existing literature.

To summarize, the fact that the gender-resolution pattern does not extend to the predicative-adjective and passive agreement shows clearly that whatever the process behind the seeming feature resolution is, it cannot be a result of narrow-syntax-feature valuation as part of agree with more than one accessible goal. Next section proposes a theoretical alternative.

4 You are what you probe

If mismatched gender features on conjuncts were syntactically resolved within a conjunction phrase (ConjP), agreement with such a phrase should always realize the same features. As we have seen in the previous section, this prediction is not borne out. I argue that instead the resolution pattern depends on the unvalued

¹¹One could argue that the difference between the animate ending *-i* and the gender-plural ending *-y* is no longer preserved in modern Czech as the original phonological distinction does not exist anymore, i.e., the corresponding past tense forms are homonyms. Yet, the neuter plural ending is clearly distinct which makes a syncretic explanation untenable.

features of the probe. In order to account for the data I propose the following generalization: If the value of the gender feature on the first conjunct and the value of the gender feature on the second conjunct do not match, feature resolution depends on whether the probe probes (a) only for gender (and number), or (b) whether it probes for person. If the probe (here, verbal predicate, including the past tense formation) probes for a valued person feature, we observe a resolution along an animacy scale. We saw this pattern in §2. If, however, the probe probes only for a valued gender feature, i.e., there is no unvalued person feature on the probe, feature resolution is severely limited and may even yield agreement gaps. This is the pattern we saw in §3. The question that arises is why the apparent feature resolution plays out differently for different probes.

We already concluded that a gender-feature resolution as part of narrow-syntax-agree valuation cannot be the answer. In order to understand the pattern we need to turn to the question of how the label of a conjunction phrase and its corresponding features are determined. I.e., the proposed analysis will implement two factors: unvalued features on the probe and the feature composition of the label of the conjunction phrase.

In a nutshell, I argue that the label of the conjunction phrase is determined in the syntax-semantics interface, and the labelling process is analogical to the feature resolution attested in split-anterecedent pronouns (Heim 2008, Sudo 2012), i.e., plural pronouns that simultaneously refer to more than one antecedent (e.g., *you* and *I* gives *we*), provides an explicit algorithm for how the features of the referring antecedent are computed from a mixed-feature input. In the present proposal, the actual agreement is then modelled as a narrow-syntax agree that targets the conjunction-phrase label as the syntactic representation of the conjunction phrase, where label is a syntactic representation of all features present in the corresponding extended projection and relevant for next syntactic building. There are three components: First, agree is successful only if the label provides features that match the features of the probe. Second, following Sudo (2012), I assume that the syntax-semantics interface manipulates semantic indices (i.e. numerical pointers). Crucially, indices are complex structures, enriched by person, gender, and number information. Third, this complex-index information can be mapped onto morphology. Fourth, morphology can only realize features uniquely determined and valued by the label of the probe. The consequence is that if agree probes for person, agreement reflects the complex features of the indices. If agree probes for gender, it can only use gender features available to the narrow syntax component. In other words, while semantics can build new objects (complex indices), syntax can only copy existing values of features. Con-

sequently, if agree probes for person, it can used the complex structures built by the syntax-semantics interface. If agree probes for gender, it may only use features already present in narrow syntax.

4.1 Features of the conjunction-phrase label

The idea that there is a connection between agreement with coordinated noun phrases and features of split-anterior pronouns is intellectually indebted to Farkaš & Zec (1995) that proposed a striking generalization, namely, that the morphological features on the predicate agreeing with a nominal conjunction are always identical to the morphological features of a pronoun anaphorically referring to the same coordination. To implement this idea I follow Heim (2008) in her treatment of split-anterior pronouns and Sudo (2012) in his treatment of complex indices underlying the morphological representation of split-anterior pronouns.

Furthermore, I follow Narita (2011) and Chomsky (2013) in that labelling is a process triggered by the semantic interface (CI) and argue that the person feature is crucial in the labelling process in that it provides a formal connection between narrow syntax (person as a syntactic feature) and semantic representation (person mapped on a (referential) index; Longobardi 2008, Sudo 2012, Landau 2010, among others). The connection arises via implementing the person feature as [\pm PARTICIPANT] (Nevins (2007) and the literature cited there). Furthermore, I follow the literature on coordination that argues that the plurality of a nominal conjunction is computed as semantic plurality (Munn 1993, Bošković 2009, Bhatt & Walkow 2013). Technically, I implement a semantic plurality as a conjunction of person features, more precisely, semantic plurality is a conjunction of non-matching indices based on the person feature.

For concreteness, I assume the person-feature hierarchy and its morphological mapping as exemplified in Figure 1. Note that the implementation via the [\pm PARTICIPANT] feature lends itself easily to accounting for the intrinsic marking of animacy that is critical for the empirical pattern at hand. Next subsection provides a detailed derivation of the attested patterns.

4.2 Accounting for the resolution pattern

The first case to consider is the agreement patterns in which the probe probes for a person feature (the data discussed in §2). Based on the person-feature geometry in Figure 1 there are three basic cases to consider based on the label of the conjunction phrase: (a) there is a [+PERSON] feature, valued as [+PARTICIPANT], (b)

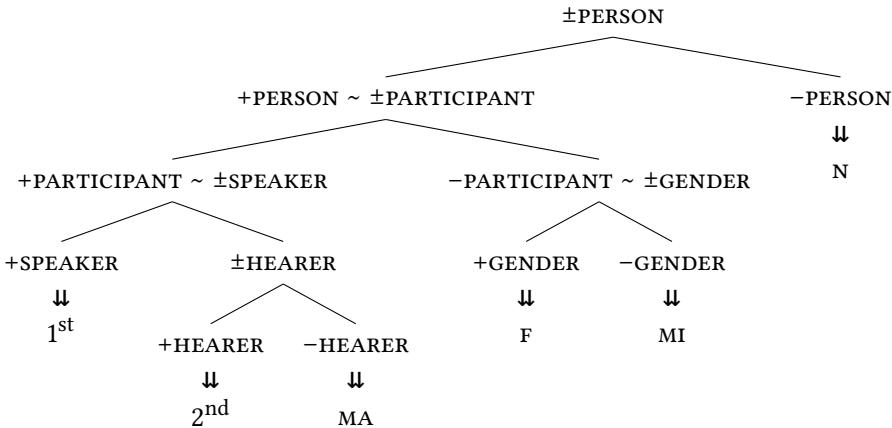


Figure 1: Feature hierarchy & morphological mapping (modelled after [harleyritter02](#) and [Bartošová & Kučerová 2015](#))

there is a [+PERSON] feature, valued as [-PARTICIPANT], and (c) there is [-PERSON] feature. As for number, throughout the section I assume that both conjuncts will associate with an index and that the indices will not be identical. The assumption that semantic plurality corresponds to a conjunction of non-matching indices is motivated by examples such as that in (11). Consequently, the semantic number will be set as plurality and morpho-syntactically will correspond to a valued number feature (technically, [-SG]).

- (11) a. His best friend_i and editor_j is by his bedside. $i = j \Rightarrow$ singular
 b. His best friend_i and editor_j are by his bedside. $i \neq j \Rightarrow$ plural

The first case to consider is a case in which the conjunction label will contain the features [+PERSON] feature, valued as [+PARTICIPANT], and [-SG]. I argue that this labelling arises whenever one of the conjuncts is syntactically valued as masculine animate. The reason is that the masculine animate valuation corresponds to the [+PERSON] feature, valued as [+PARTICIPANT]. Since the labelling operation takes place at the syntax-semantics interfaces, the system minimally searches the embedded structure for features binding to the semantic component. Which is to say, if there is a [+PERSON] feature and if there is a [+PARTICIPANT] in the searchable domain, these features must be copied (technically, identity-merged) into the label of the conjunction phrase. Consequently, irrespective of the features of the other conjunct, the labelling reflects the presence of the semantically marked features. In turn, morphology copies the feature combination onto the plural animate agreement (traditionally called masculine inanimate plural) (see [Bhatt &](#)

Walkow 2013 for an argument in favour of agreement as morphological copying). This configuration is exemplified in (12), repeated from (2) above. Notice that the morphological realization does not recognize masculine animate feature as such but it solely realizes the valued [+PARTICIPANT] feature in the plural context.

- (12) {Kočka / kotě / dobytek} a pes jedli ze stejné misky.
cat.F.SG kitten.N.SG cattle.MI.SG and dog.MA ate.PP.MA.PL from same bowl

‘The cat/kitten and the dog ate from the same bowl.’

$$F/N/MI + MA = MA \text{ (ANIMATE)}$$

Let us now consider the next case which is the case when there is a [+PERSON] feature but no [+PARTICIPANT] feature in the label of the conjunction phrase. This case arises if none of the conjuncts is syntactically valued as masculine animate but one or both conjuncts are syntactically valued as masculine inanimate or feminine. Since the label is marked as [-PARTICIPANT], the morphological realization resorts to the gender marking in the context of plural, i.e., the syncretic morphology for masculine-inanimate plural and feminine plural. This feature combination is exemplified by (3), repeated below as (13).

- (13) Kotě a {kočka / dobytek} jedly ze stejné misky.
kitten.N.SG and cat.F.SG cattle.MI.SG ate.PP.{MI/F}.PL from same bowl
‘The kitten and the cat/cattle ate from the same bowl.’

$$N + MI/F = \{MI/F\} \text{ (GENDER)}$$

Now we can finally turn to the last case which is a probe probing for person but with none of the conjuncts specified for a [+PERSON] feature. Consequently, there is no participant-feature specification in the label of the conjunction phrase. This configuration arises when both conjuncts are in neuter. Note that according to the feature geometry in Figure 1, neuter is syntactically not a gender feature but it arises as a realization of the [-PERSON] feature. In turn, plural neuter cannot be systematically computed from the label of a coordination that refers only to person. Instead, the lack of positive valuation within the syntactic component means that the morphological realization must resort to the default gender realization (technically, failed agree, Preminger 2009). In Czech this means that morphology realizes the plural agreement as the syncretic plural gender form (MI/F). This feature combination is exemplified by (5a) and (5b), repeated below as (14) and (15).

- (14) Kotě a štěně {jedly / *jedla} ze stejné misky.
 kitten.N.SG and puppy.N.SG ate.PP.{MI/F}.PL PP.N.PL from same bowl
 'The kitten and the puppy ate from the same bowl.'

 $N.SG + N.SG = \{MI/F\} (GENDER)$

- (15) Koťata a štěně {jedly / *jedla} ze stejné misky.
 kittens.N.PL and puppy.N.SG ate.PP.{MI/F}.PL PP.N.PL from same bowl
 'The kittens and the puppy ate from the same bowl.'

 $N.PL + N.SG = \{MI/F\} (GENDER)$

The problem we just identified lies in the combinatorics behind the labelling operation. There is a caveat though. While the probe in these cases needs to be valued for person, it morphologically realizes gender features. Which is to say, if the label is uniquely labelled for gender from syntax, then morphology could realize the gender feature in and of itself. However, I argue that this may happen only if the syntactic features on both conjuncts are identical, i.e., only if narrow syntax provides **N.PL** as the common feature of the conjuncts. If this is the case, no feature calculation is necessary and the system solely copies the neuter plural label of its parts into the label of the conjunction phrase and this information determines the morphological mapping of the resulting agreement as neuter plural. This is the pattern we saw in (5c), repeated below as (16).

- (16) Koťata a štěňata jedla ze stejné misky.
 kittens.N.PL and puppies.N.PL ate.PP.N.PL from same bowl
 'The kittens and the puppies ate from the same bowl.'

 $N.PL + N.PL = N.PL$

The behaviour of neuter is crucial for our understanding of the overall system. Notice that there is no optionality in (16). Which is to say, if syntax can uniquely derive the values of syntactic features of the conjunction phrase label, agree must respect these values. If, however, syntax cannot uniquely derive these values (in our cases, because there is a feature-valuation conflict), then morphology refers to the features of indices derived by the syntax-semantics interface as the only available structural information.

We have successfully derived the complete pattern of the seeming gender-feature resolution by referring only to the person feature. Table 2 summarizes the features in the label that were relevant in the process and the morphological mapping they triggered.

Table 2: Labelling of the conjunction phrase and morphological realization: probe = person

features of conjuncts	features copied by probe	morphology	exs
MA & α , where $\alpha \in \{\text{MA, MI, F, N}\}$	[−SG, +PERSON, +PARTICIPANT]	animate (MA)	(2), (12)
MI or F & α , where $\alpha \in \{\text{MI, F, N}\}$	[−SG, +PERSON, −PARTICIPANT]	gender ({MI/F})	(3), (13)
N.SG & N.SG	[−SG, −PERSON]	default (~gender={MI/F})	(14)
N.PL & N.SG	[−SG, −PERSON]	default (~gender={MI/F})	(15)
N.PL & N.PL	[−SG, −PERSON, N.PL]	copy (N.PL)	(16)

4.3 Accounting for the resolution failure

Let us now turn to the data pattern discussed in §3, i.e., the pattern in which the probe does not have any unvalued person feature but probes for a gender feature instead. While the derivational procedure described in the previous subsection crucially relies on the ability of the syntax–semantics interface to construct a complex semantic index from the person representation in the label of the conjunction phrase, a probe that probes only for gender cannot use this complex information but must rely on the syntactically present valuation of gender. In turn, we expect the agreement patterns to play out differently.

Before we proceed to the individual patterns, let us consider the geometry of the gender features. According to the feature-geometry of person proposed in Figure 1, only the masculine inanimate and feminine feature correspond to a binary gender feature. Masculine animate corresponds to a morphological realization in the context of [+PARTICIPANT]. The syncretic masculine inanimate and feminine plural is a default realization of the [+PERSON] feature, i.e., without a [+PARTICIPANT] feature. We have also seen that although neuter should in principle appear in the context of [−PERSON], it does not, as it only can be copied. The core difference between the cases discussed in the previous subsection and the cases discussed in this subsection is that in the previous cases distinct values of

person and participant features have been resolvable in the process of the complex index formation. The features that were used to value the unvalued person of the probe were indeed features that were mediated by the formation of the complex semantic index. The question is what happens, if there is no uniform person representation mediated by the complex-semantic-index formation?

I argue that in such a case, an unvalued gender feature on the probe can be valued only if the conjuncts share the features relevant for the morphological mapping procedure. It follows that agreement will be successful only if (a) there is no mismatch of gender features (the trivial case) or (b) both conjuncts are [+PARTICIPANT]. All other combinations should be degraded. This prediction is borne out.

As we already saw, if one conjunct is masculine animate, the other conjunct must also also masculine animate, or feminine that can semantically be construed as animate. This follows from the restriction that both conjuncts must be [+PARTICIPANT], that is animate, as only animate entities can be modelled as participants. Consequently, in this feature combination, the plural agreement is animate, i.e., morphologically realized as MA. An example of this feature interaction is given in (6), repeated below as (17).

- (17) a. Petr a Pavla byli unavení.
 Petr.MA.SG and Pavla.F.SG were.PP.MA.PL tired.PP.MA.PL
 ‘Petr and Pavla were tired.’
- b. Pes a kočka byli unavení.
 dog.MA.SG and cat.F.SG were.PP.MA.PL tired.PP.MA.PL
 ‘The dog and the cat were tired.’

$$\boxed{\text{MA} + \text{F} = \text{MA (ANIMATE)}}$$

Note that in this case, although there is no uniform gender feature in the label, the shared [+PARTICIPANT] feature is sufficient for the derivation to converge.

If gender is not specified for animacy, there is no feature information in the label of the conjunction phrase that could be used to value the gender feature on the probe. There are two cases to consider. If there is no [+PARTICIPANT] feature, the combination is degraded but the speakers have an intuition what the best form would be. I argue this is because there is no valuation in syntax. Yet, the speakers can use their knowledge of what the feature formation would be if there was a person feature as a formal mediator. In other words, this is a case of syntactic valuation failure, with a partial rescue by morphology. An example of this combination is in (7)–(9), repeated below as (18)–(20).

- (18) ?? Dobyték a kotě byly unavené.
cattle.MI.SG and kitten.N.SG were.PP.F/MI.PL

'The cattle and the kitten were tired.'

$\boxed{\text{MI} + \text{N} = ??\{\text{MI/F}\} (\text{GENDER})}$

- (19) Dobyték a kotě byly unavený.
cattle.MI.SG and kitten.N.SG were.PP.PL tired.PP.PL
'The cattle and the kitten were tired.'

- (20) ?? Kočka a kotě byly unavené / unavená /
cat.F.SG and kitten.N.SG were.PP.F.PL tired.PP.F.PL tired.PP.N.PL
unavený.
tired.PP.COLLOQ-PL

'The cat and the kitten were tired.'

$\boxed{\text{F} + \text{N} = ??\text{F/N/COLLOQ} (\text{GENDER})}$

The more interesting case is the case when the label combines a [+PERSON] and a [-PERSON] feature. Without the complex semantic index being computed and used to value a person on the probe, speakers clearly lack any indication of what the morphological mapping should be. In turn, there is no morphological form that could save the failed syntactic valuation. This is what underlies the agreement gaps we saw in (10), repeated below as (21).

- (21) a. ☺ Pes a kotě byli ??{unavené / unavení / unavená}.
dog.MA.SG and kitten.N.SG were.MA.PL tired.PP.MI/F.PL PP.MA.PL
PP.N.PL

Intended: 'The dog and the kitten were tired.'

$\boxed{\text{MA.SG} + \text{N} = ☺}$

- b. ☺ Psi a kočata byli ??{unavené / unavení / unavená}.
dogs.MA.PL and kitten.N.SG were.MA.PL tired.PP.MI/F.PL PP.MA.PL
PP.N.PL

Intended: 'The dogs and the kittens were tired.'

$\boxed{\text{MA.PL} + \text{N.PL} = ☺}$

5 Predictions

The core property of the system proposed in the previous section is that agreement with coordinated noun phrases is always mediated by the label of the conjunction phrase. Crucially, we saw that some agreement combinations cannot

be resolved because of a problem with valuation of the agree probe because the label of the conjunction phrase has not been uniquely resolved. Interestingly, in the domain of agreement gaps, we saw that even if there is a good morphological match, the lack of successful valuation yields agreement failure. Consequently, if this reasoning is correct, we expect to find problems with valuation elsewhere. This section investigates two empirical domains that confirm this prediction.

Let us start with agreement gaps. If agreement gaps result from problems of labelling, i.e., from the fact there is no unique feature in the label that could value an unvalued feature of the probe, we expect to find agreement gaps elsewhere. This prediction is born out in comitative constructions and first-conjunct agreement constructions. Although in comitative constructions only one conjunct is in nominative, agreement is with both conjuncts. Which means the agreement must be based on the features of the label of the conjunction phrase. Consequently, we expect agreement gaps to arise exactly in the same environment as with regular coordinated phrases. Which is to say, we expect agreement gaps whenever the probe does not probe for person but only for gender, and whenever the conjuncts do not share gender features or are not both marked as [+PARTICIPANT]. This prediction is borne out, as can be seen, for example, in (22).

- (22) ?? Pes s kotětem byli unavení /
 dog.NOM.MA.SG with kitten.INSTR.N.SG were.PP.MA.PL tired.MA.PL
 unavené / unavená.
 {MI/F}.PL N.PL
 Intended: ‘The dog and the kitten were tired.’

Interestingly, even if the predicate morphologically agrees only with the first conjunct, we predict that the adjectival agreement should be ungrammatical if the conjunction phrase cannot be uniquely labelled. This prediction follows if the morphological realization of agreement is post-syntactic but agree targets the label of the conjunction phrase. As the example in (23) demonstrates, this prediction is indeed borne out. To my knowledge no current theory of first-conjunct agreement predicts (23) to be ungrammatical.

- (23) * Byl unaven pes a kotě.
 was.PP.M.SG tired.M.SG dog.NOM.MA.SG and kitten.N.SG
 Intended: ‘The dog and the kitten were tired.’

Let us now turn to the second group of predictions. Without saying it explicitly, I assumed throughout the paper that the predicates probe only after the conjunction phrase was spelled-out. This assumption follows from the fact that the

relevant notion of labelling is a process that takes at the syntax-semantics interface, which is to say, it is part of the spell-out procedure. The prediction then is clear: only elements that probe after the spell-out of the conjunction phrase can agree with both conjuncts. The reason is that without the label, there is no syntactic representation of the conjunction phrase that would combine features of both conjuncts. This prediction is borne out as well, as can be demonstrated on two agreement patterns.

First, if an adjectival adjunct modifies a conjunction, it must be syntactically adjoined before the conjoined phrase is spelled-out. Consequently, even a conjunct that semantically modifies both conjuncts must morphosyntactically agree with only one of the conjuncts. The example in (24) demonstrates this point. Although the adjective ‘young’ may semantically modify only the man or it may modify both the man and the woman, it must agree only with the first conjunct. The plural agreement is ungrammatical.

- (24) {*mladí / mladý} muž a žena
young.MA.PL M.SG man.MA.SG and woman.F.SG
'a young man and a young woman' or 'a young man and a woman'

This point can be further strengthened by the following fact. In Czech, determiners that semantically select for plurality cannot modify a conjunction of singular individuals. Thus, for example, *oba* ‘both’ is ungrammatical within a conjunction phrase, as shown in (25).

- (25) ◎ *{oba / obě} kočka a kotě
both.MI both.F/N.PL cat.F.SG and kitten.N.SG
Intended: 'both the cat and kitten'

6 Conclusions

This paper contributes to our understanding of syntactic agree and its morphological realizations in four important respects. First, I presented an argument that narrow syntax cannot resolve a conflicting feature valuation. Syntax can only copy and share. Second, patterns that seem to involve some form or feature resolution are mediated by feature resolution at the syntax-semantics interface. Concretely, I argued that feature resolution arises only as part of semantic index formation, dependent on person-feature representation in narrow syntax. Third, I provided an empirical argument that labelling conflicts are fatal to feature valuation as agree. There is no morphological rescue. Fourth, I demonstrated that

morphological features realized on agreeing elements do not have to faithfully match the underlying bundle of syntactic features. Although the final conclusion is not surprising in the light of the work done in the Distributed morphology framework, it raises non-trivial questions about the empirical accuracy of generalizations in the domain of agreement.

The core argument presented in the paper relies on the very existence of combinations of features that cannot be syntactically resolved. The fact that there exist combinations that cannot be syntactically resolved in and of itself provides sufficient evidence that there cannot be a default syntactic mechanism that would underlie the seeming resolution patterns. Interestingly, as pointed out by two anonymous reviewers, there are naturally attested examples with seemingly parallel combinations of features that are perceived by native speakers as more acceptable or fully acceptable. Which is to say, there appear to be agreement strategies that go beyond the mechanics proposed in this paper. Providing an exhaustive description and a theoretical account of agreement resolution patterns in Czech dialects and Slavic in general goes beyond the present work. Yet I would like to conclude the paper with a couple of observations about the possible nature of the attested variation and its underpinning.

The data brought by the anonymous reviewers seem to fall into two groups: examples from colloquial Czech (dialects attested in the eastern part of the Czech Republic), as in (26), and examples with human participants, as in (27).

- (26) Člověk a prase jsou si navzájem souzení, stvořeni jeden man.MA and pig.N are REFL mutually judged.MA.PL created.MA.PL one pro druhého.
for second
'A man and a pig are meant for each other, been created one for another.'
- (27) Po půlhodině hraní byli tatínek i miminko úplně vyčerpaní.
exhausted.MA.PL
'After playing for half an hour, the father and the baby were entirely exhausted.'

The data and judgements presented in this paper come from Standard Czech, a prescriptive variety, that overlaps in the relevant morphological features with eastern Moravian dialects (e.g., KarlikEtAl:2002). Speakers of these dialects typically have the same or similar type of morphological syncretism and range of

morpho-syntactic features as preserved in Standard Czech. Speakers of western dialects or Prague-centered colloquial varieties often lack the full range of distinct morpho-syntactic patterns. One might wonder whether the distinct morphological syncretism underlies examples such as that in (26). If that was the case, examples of this sort would provide a challenge to the present proposal.

We know, however, that the variation in agreement goes beyond morphological syncretism. The dialects fundamentally vary in their semantic index representation, as attested by differences in binding. Consider the example in (28).

- (28) % Petr_i má rád jeho_i matku.

Petr has liked his mother

'Peter likes his mother.'

While (28) yields a severe Principle B violation in Standard Czech and Moravian dialects, it is fully acceptable in some Bohemian dialects (Jakub Dotlačil, p.c.). If, indeed, there is a connection between a person-feature resolution and semantic index representation and if differences in binding follow from differences in index representations (Heim & Kratzer 1998, Roelofsen 2008), it is not altogether surprising that we might find distinct resolution patterns. The same point applies to the inter-Slavic variation as reported in corbett83 and much subsequent work. We know that agreement resolution varies in Slavic dialects. But equally there is an insufficiently studied variation in binding (e.g., Nikolaeva 2014).

The other point concerns an effect of humanness. It seems that at least in some cases replacing a non-human animate DP with a human-denoting animate DP improves the resolution pattern. We know independently that humanness closely interacts with a person representation (e.g., Ritter 2014; Wiltschko & Ritter 2015). It is possible that we see a related effect here as well.

A closer investigation of these intriguing patterns must, however, await future research.

Abbreviations

COLLOQ	colloquial	N	neuter
ConjP	conjunction phrase	NEG	negation
F	feminine	NOM	nominative
INSTR	instrumental	PL	plural
M	masculine	PP	participle
MA	masculine animate	REFL	reflexive
MI	masculine inanimate	SG	singular

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Chapter 9

Surviving sluicing

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In this paper, we discuss examples of sluicing in Slovenian in which, in addition to a wh-phrase (or wh-phrases in instances of multiple sluicing) discourse particles appear. This is unexpected given merchant2001's (merchant2001) Sluicing-COMP generalization, as already observed in marusicetal2015, even though there are several languages in which similar cases exist, e.g. German. In this paper we focus on discourse particles *pa* and *že* in (multiple) wh-questions and sluicing. These examples are not only important for our understanding of sluicing but are also crucial for analyzing discourse particles in Slovenian. Based on examples with sluicing and discourse particles in Slovenian, we argue against positioning these particles within the wh-phrase, clitic cluster or the IP.

Keywords: Slovenian, sluicing, particles, sluicing-COMP generalization

1 Introduction

In this paper we address the phenomenon already discussed in marusicetal2015, i.e. cases in which in addition to a wh-phrase a discourse particle appears in sluicing in Slovenian. These cases are unexpected given the standard understanding

of sluicing, which is in **ross1969** described as deletion of parts of the embedded question that are identical to some part of the antecedent clause, leaving only the wh-phrase, as shown in (1).

- (1) I heard somebody, but I don't know [who I heard].

Despite **ross1969**' definition of sluicing as a phenomenon in embedded clauses, today, sluicing is taken to be a type of ellipsis phenomenon “in which the sentential portion of a constituent question is elided, leaving only a wh-phrase remnant” (**merchant2006**: 271) which can occur in embedded or root clauses. In what follows, all Slovenian examples will be cases with sluicing in root clauses.¹

The insight that only the wh-phrase remnant appears in sluicing is formalized in Merchant's Sluicing-COMP generalization, given in (2), in which “operator” stands for “syntactic wh-XP”, “material” for any pronounced element, and “COMP” for “material dominated by CP but external to IP” (**merchant2001**, 62). Given a standard understanding of what CP represents, if one assumes the expanded left periphery à la **rizz1997fine**, we assume this generalization was meant to be read as follows: In sluicing only wh-phrases survive ellipsis as they are the only elements occupying the left periphery. Apart from the wh-phrase, the left periphery does not contain any overt elements.²

(2) Sluicing-COMP generalization

In sluicing, no non-operator material may appear in COMP.

(**merchant2001**: 62, (71))

Given this, as observed in **marusicetal2015**, examples such as (3) are unexpected. In all examples given in (3), non-wh-material survives sluicing:³

¹While sluicing also exist in embedded clauses in Slovenian, as (i) shows, examples with discourse particles, which we are looking at in this paper, are limited to root clauses. This is not surprising, given that discourse particles are typically a root clause phenomenon, which is related to their relation to both the illocutionary force and sentence type of the clause (**bayerobenauer2011**: 452).

(i) Vid je nekoga srečal. Ne vem, koga (*pa).
Vid AUX someone met.ACC not know who.ACC PTCL
'Vid met someone. I don't know who.'

²This seems exactly what Merchant's informal explanation of his generalization says: “The claim is that only segments directly associated with the syntactic operator – the wh-XP – will be found overtly in sluiced interrogatives.” (**merchant2001**)

³Wh-elements in Slovenian contain the wh-morpheme *k-/č-*, the particles, however, do not (cf. **marusicetal2015**).

- (3) a. Vid je srečal nekoga. Koga pa?
 Vid AUX met someone. Who PTCL
 ‘Vid met someone. Who <did he meet>?’
- b. Vid je srečal nekoga. Koga že?
 Vid AUX met someone. Who PTCL
 ‘Vid met someone. Remind me, who <did he meet>?’
- c. Vid je srečal Janeza. Koga še?
 Vid AUX met Janez. Who PTCL
 ‘Vid met someone. Who else <did he meet>?’
- d. Vid je srečal nekoga. Koga to?
 Vid AUX met someone. Who PTCL
 ‘Vid met someone. Who <did he meet>?’
- e. Vid je srečal nekoga. Koga spet?
 Vid AUX met someone. Who again
 ‘Vid met someone. Who (are you saying again) <did he meet>?’
- f. Vid je srečal nekoga. Koga pa to?
 Vid AUX met someone. Who PTCL PTCL
 ‘Vid met someone. Who <did he meet>?’
- g. Vid je srečal Ano pa še nekoga. Koga pa še?
 Vid AUX met Ana and also someone. Who PTCL PTCL
 ‘Vid met Ana and someone else. Who else <did he meet>?’

As wh-phrases in sluicing can also be complex, as in (4), one can imagine these discourse particles that follow wh-words in (3) could also be part of a complex wh-phrase.

- (4) A: Peter je videl neko punco.
 Peter AUX saw some girl.
 ‘Peter saw some girl.’
- B: Katero punco?
 which girl
 ‘Which girl?’

As shown in **marusicetal2015** these particles do not form a constituent with the wh-material, but are rather a part of the extended left periphery (in the sense of **rizzi1997fine**) that is not elided in sluicing in Slovenian.⁴

⁴Note that examples in (3) are also not instances of swiping (**merchant2002swiping**), as these particles are not prepositions, or spading (**van2010syntax**), as these particles are not demonstrative pronouns.

In this paper we look at the sluicing examples with particles more closely in order to better understand where exactly particles are located and where they originate. We present new arguments against placing particles inside wh-phrases and show that particles really are part of the left periphery and thus offer further support for the analysis according to which non-wh-material in the left periphery does not have to be elided in sluicing in Slovenian (**marusicetal2015**).

We start with an assumption that sluicing is the ellipsis of the IP portion of a constituent question (**ross1969**; **merchant2001**; **merchant2006**), which means the examples in (3) are parallel to the examples in (5).⁵ Based on this, we discuss the role of discourse particles in both wh-questions and sluicing. From now on, we gloss the two Slovenian particles under discussion as PA and ŽE.

- (5) a. Koga pa je Peter videl?
who.ACC PA AUX Peter.NOM saw
'Who did Peter see?'
b. Koga že je Peter videl?
who.ACC ŽE AUX Peter.NOM saw
'Who did Peter see?'

While examples in (3) show that there are several discourse particles that can appear in sluicing in Slovenian, we focus only on discourse particles že and *pa* here. Some initial thoughts on other particles in sluicing can be found in **marusicetal2015**, but since the role of Slovenian discourse particles in wh-questions has previously not been sufficiently described, we start off by showing some properties these elements display when they are used as discourse particles (and not topic or focus particles). Both *pa* and že have many different uses and meanings, which we will discuss in §2. In §3 we take examples with sluicing and the particles *pa* and že to give new arguments both against positioning these particles within the wh-phrase and to show that in addition to (complex) wh-phrases non-wh-material can also survive sluicing in Slovenian. In §4 we discuss the position of discourse particles with respect to the clitic cluster and the adverbs in the IP to show that discourse particles appear in the left periphery, higher than IP adverbs, confirming the earlier proposal by **marusicetal2015**. §5 concludes the paper.

⁵We are avoiding the debate on the nature of the ellipsis site in sluicing, particularly whether it has the same exact structure as the antecedent (which is what we adopt, following **ross1969**, **merchant2001**, and others) or whether it is structurally empty with its content being supplied by re-using syntactic structure from some accessible point elsewhere in the discourse (which is what **chungetal1995**, **chungetal2011**, among others are arguing for). Our data do seem to favor the approach we are adopting, but we do not want to go into this discussion here.

2 Discourse particles *že* and *pa* in Slovenian wh-questions

In general particles *že* and *pa* (as do other discourse particles in Slovenian) display some properties that are typically found with discourse particles cross-linguistically. For example, as zimmermann2011 notes, discourse particles carry more than one function and can also be used as focus particles, discourse markers (i.e. markers that establish coherence in the discourse) or adverbials.⁶ This also holds for *pa* and *že*, e.g. *že* is also an aspectual adverb. Furthermore, discourse particles in Slovenian are optional (as in other languages, see bayerobenauer2011 for German), to a certain extent various discourse particles can appear simultaneously in the clause, they are sensitive to clause type, they normally do not bare stress, and are monosyllabic. And perhaps most importantly, discourse particles do not modify the proposition, but rather the utterance (bayerobenauer2011) as they express speakers' attitude towards the utterance (zimmermann2011). To further show properties of particles *že* and *pa* in Slovenian, we discuss them separately in this section.

2.1 Že as a discourse particle

Etymologically the origin of Slovenian particle *že* is closely related to the morpheme *-r* that one finds in relative pronouns in Slovenian (*k dor* 'who', *k ar* 'what', *k jer* 'where'). Both are etymologically related with the Indo-European particle **g^he/*g^ho* that has developed into particles in several Slavic languages, for example *že* in Russian (see hagstrommccoy2003 for its interpretation in wh-questions), and *že* in Czech (skrabalova2012) (cf. mitrovic2016benj). But despite the common source, languages differ with respect to the actual meaning of *že*.

For example, skrabalova2012 shows that the Czech *že* is a complementizer that can be used in declarative and interrogative clauses. In embedded contexts *že* combines with the declarative clause and it marks syntactic dependence of embedded clause, but *že* also triggers an echo-interpretation in Czech.⁷ That is, in wh-questions, following skrabalova2012 *že* indicates that the speaker has not heard or that (s)he refuses to accept a previous utterance. For example, (6) is used to check whether the part of the utterance asked by the wh-word was asserted in the previous context, see skrabalova2012 for more on Czech *že*.

⁶For further differences between discourse markers and discourse particles see, for example, zimmermann2011.

⁷Czech particle *že* is in many respects similar to Slovenian *da* 'that', which can be used as a complementizer or a discourse particle, see marusicetal2015 for more on this topic.

- (6) A: Kam že Petr šel?
where that Peter went
'Peter went where?'
B: Přece do restaurace!
indeed to restaurant
'(I said he went) to a restaurant.'

(Czech; skrabalova2012: 5, (10))

As mccoy2003 observes, Russian *že* can function as a modal/affective particle, focus marker, marker of contrastive focus, emphasis marker, thematic/ organizational/ textual *že*, marker of (re-)activated information, and marker of a reference point in the activated domain of reference. hagstrommccoy2003 and mccoy2003 observe the following contexts with distinctive occurrences of *že* in Russian: yes-no questions, wh-questions, statements with phrasal scope and statements with sentential/propositional scope. Example (7) shows the use of *že* in a wh-question. Crucially, it depicts a situation where the child wants to sleep in the morning, which seems unreasonable to the mother, as the child is not supposed to have a reason to feel sleepy at that time. That is, example (7) is a rhetorical question, where *že* roughly corresponds to the English *in the world*. As shown in (8), *že* can be used in Slovenian in a similar way.⁸

- (7) Varen'ka, nu Varen'ka, nu začem že tebe baj-baj s
Varen'ka PTCL Varen'ka PTCL why PTCL to.you night-night from
utra.
morning.
'Well, Varen'ka, why in the world do you need night-night in the
morning?' (Russian; mccoy2003: 125)
- (8) *Situation:* Ana asks Vid for help and Vid answers (in a bit irritated tone):
Zakaj že bi ti pomagal?
why že COND you helped
'Why on earth should I help you?'

⁸As mccoy2003 observes, in these rhetorical questions the speaker does not expect a possible reasonable/true answer. Moreover, her conclusion is that *že* in wh-questions applies to every member of set of contextually accessible answers to the question, generating presupposition for each proposition in the set. Therefore, Russian *že* in wh-questions generates presupposition that the possible answers from the set in question have already been evaluated as false and the same applies to Slovenian *že* under conditions as presented in (8).

While (8) already shows one meaning of the particle *že*, *že* most commonly appears as an aspectual adverb meaning ‘already’, as shown in (9). Using *že* as an aspectual adverb is very common, and while in some cases *že* can receive this interpretation in addition to the discourse particle reading, this is not directly relevant for the present discussion.⁹

- (9) Peter je že šel na počitnice.
 Peter AUX že went on vacation
 ‘Peter has already left for the vacation.’

While we can also find the aspectual meaning in wh-questions, the use of *že* in sluicing or a wh-question more importantly indicates that the speaker knows the answer to the question but does not remember it. We will refer to this reading as the ‘remind-me’ reading, following *sauerland2014wieder*, and will use *že-R* to refer to the morpheme carrying this meaning. The morpheme carrying the aspectual reading will be referred to as *že-A*. The former reading is apparent in the following scenario. Imagine we visit our friend Peter in April, but his mother tells us he is not home, we remember that he is never home in the spring and we actually know where he always travels in the spring, but at the moment we cannot recall where he travels. We ask his mother the question in (10) as a ‘remind-me’ question.

- (10) Kam že hodi vsako leto?
 where že goes every year
 ‘(Remind me) Where does he go every year?’

This meaning is possible in wh-questions and in sluicing, while *že* in yes/no-questions (or in declarative sentences), such as (11), can receive the aspectual reading, but not the ‘remind-me’ reading.

⁹There are also other meanings, for example, *že* can be used to express agreement with a statement:

- (i) A: Miha je opral obleke.
 Miha AUX washed clothes
 ‘Miha washed the clothes.’
- B: Že že, a ne vem, kdo jih je zlikal.
 že že but not know who it.ACC AUX ironed
 ‘True, but I don’t know who ironed them.’

- (11) A je že opral obleke?
Q AUX že washed clothes
Available: ‘Did he already wash the clothes?’
Unavailable: ‘(Remind me) Did he was the clothes?’

Interestingly, as shown in (12b), both the ‘remind-me’ interpretation and the aspectual reading of že are available when že and the wh-word are not adjacent. In relation to this, two things need to be noted. First, the availability of že-R in (12b) implies that *kaj* ‘what’ and že-R do not necessarily form a constituent, as clitics do not split syntactic constituents in Slovenian.¹⁰ Second, when že precedes the auxiliary clitic, only the ‘remind-me’ reading is available.¹¹

- (12) a. Kdo že je naslikal Guernico?
who že AUX painted Guernica.ACC
Available: ‘(I need to remember) who painted Guernica?’
Unavailable: ‘Who already painted Guernica?’
- b. Kdo je že naslikal Guernico?
who AUX že painted Guernica.ACC
Available: ‘(Remind me) who painted Guernica?’
Available: ‘Who already painted Guernica?’

In a wh-question že-R follows the wh-phrase. Examples in which že-R precedes the wh-word are unacceptable, as wh-phrases need to appear in a clause initial position in Slovenian wh-questions, see **mismas2016benj**.

- (13) * že kdo je naslikal Guernico?
 že who AUX painted Guernica
Intended: ‘(Remind me) who painted Guernica?’

¹⁰ Consider for example the ungrammaticality of (i.b):

- (i) a. Poletni dež je prekinil zabavo.
summer rain AUX stopped party
'Summer rain stopped the party.'
b. *Poletni je dež prekinil zabavo.

¹¹ A note on intonation is needed. That is, when (12b) is interpreted as a wh-question with že-A, it will also receive a normal wh-intonation. On the other hand, že-R in (12b) is emphasized and the question ends with a rising intonation (similar to the intonation in yes/no-questions). Interestingly, (12a) does not receive a true wh-reading if we change the intonation and the only interpretation it can receive is the ‘remind me’-reading. This implies that the intonation does not trigger the ‘remind-me’ interpretation of the wh-question.

In sluicing, *že* can only receive the ‘remind-me’ reading, as (14) shows. That is, (14) can be used in a context where the speaker is playing a game, where (s)he needs to name the author of Guernica. The speaker knows the answer, but cannot remember it, so (s)he utters:¹²

- (14) Seveda vem, kdo je naslikal Guernico. Kdo že?
 of course know who AUX painted Guernica.ACC who ŽE
 ‘Of course I know who painted Guernica? (I need to remember) Who?’

Crucially, in (14) *že* cannot be interpreted as an aspectual adverb. Given that aspectual adverbs are located in the IP area and as sluicing is said to delete the entire IP area, the lack of aspectual reading for *že* is expected. And as *že-R* is available in the structure where IP is supposedly missing, we have an argument to assume *že-R* originates inside the left periphery. We return to this question below in §4.

2.2 *Pa* as a discourse particle

Following snoj2009, *pa* (which has counterparts in several Slavic languages, for example in Serbo-Croatian as *pa* and *pak*, meaning ‘again’ or ‘then’, and Czech *pak* ‘then, after’) is related to *paky* ‘again’, ‘also’ in Old Church Slavonic and originates from Proto-Slavic **pâkъ*, which originally meant ‘differently’, ‘again’, ‘later’, and probably also ‘wrong’ and ‘bad’; see snoj2009 for more information on the etymology of *pa*.

Today, *pa* is a very common element in Slovenian, especially in colloquial language. The particle *pa* can be used in regular coordinations (similarly to standard Slovenian ‘and’), (15), and as a subordination complementizer such as the standard Slovenian *ampak* ‘but’. In the latter use *pa* typically appears in the second position (see marusicetal2011pa for more data), as can be seen from the examples in (16).

- (15) Peter pa Ana plešeta.
 Peter and Ana dance
 ‘Peter and Ana are dancing.’

¹²In sluicing, *že* can be used in rhetorical questions, already discussed above. That is, (i) can be used in the situation described in (8).

- (i) A pomagam ti naj? Zakaj že?
 Q help.1SG you.DAT should why ŽE
 ‘Oh, I should help you? Why?’

- (16) a. Peter pleše, poje pa ne.
Peter dances sings but not
'Peter dances, but does not sing.'
b. Peter pleše, ampak ne poje.
Peter dances but not sings
'Peter dances, but does not sing.'

The particle *pa* can function as a topic marker or as a contrastive focus marker in declarative sentences. *Pa* used as a topic marker is given in (17). In the context where friends are talking about various people dancing and someone asks about a certain person called 'Peter', (17) could be a natural reply. *Pa* can also be a contrastive focus marker, as in (18).

- (17) Petra pa še nisem videl plesati.
Peter.GEN PA yet NEG.AUX see dance.INF
'As for Peter, I have not seen him dance yet.'
- (18) Jaz bom plesal tango, ti pa step.
I will.1SG dance tango you PA tap
'While I will be dancing the tango, you should tap dance.'

Pa can be a topic/focus marker in wh-questions as well. In this role, *pa* interacts with an emphasized constituent. Based on an emphasis (marked with smallcaps), the meaning of the question in (19) varies slightly, however, we are here focusing on *pa* as a discourse marker, so we are leaving these cases aside.

- (19) a. Kdo pa PLEŠE s Petrom?
who PA dance with Peter.INS
'(We know who runs with Peter, but we want to know) who dances with Peter?'
- b. Kdo pleše pa s PETROM?
who dances PA with Peter.INS
'(We know about who dances with the others, but we want to know) who dances with Peter?'

As a discourse marker, *pa* is associated with a strongly presupposed context (see chengrooryck2000 for this interpretation of wh-in situ questions in French). That is, the situation is established and/or is presupposed and we are seeking details about the situation. Hence, just like what chengrooryck2000 claim for French, a negative answer to a wh-question with the discourse particle *pa* is unexpected.

For example, if we ask (20a) we already know that someone was visiting we just do not know who was visiting. Getting a negative answer ('Nobody.') is not impossible, but it would be surprising for the speaker to get this answer. Side note, (20b) shows that *pa* can appear before or after the auxiliary clitic, just like *že*, which again indicates that the particle and the wh-phrase do not form a constituent.

- (20) a. Kdo pa je bil na obisku?
 who PA AUX was on visit
 '(I know someone was visiting, tell me) Who was visiting?'
 b. Kdo je pa bil to?
 who AUX PA was this

This reading, related to the strongly presupposed context, is also available in sluicing.¹³ So, if we hear (21a) and we reply with the sluices in (21b) or (21c), this means that we potentially already knew (21a) or we fully accept (21a), but we need additional information about what and when Ana was eating.

- (21) a. Ana je nekaj pojedla.
 Ana AUX something ate
 'Ana has eaten something.'
 b. Kaj pa je—pojedla?
 what PA AUX ate
 'What?'
 c. Kdaj pa je—pojedla?
 when PA AUX ate
 'When?'

Examples in this section show that discourse particles can appear in sluicing in Slovenian, but more importantly, indicate that not only operator material survives sluicing, as we would expect given Sluicing-COMP generalization (**merchant2001**). The question is then why discourse particles in Slovenian are able to do so.

¹³ *Pa* in sluicing can also be a contrastive focus particle – for example (21b) can also be interpreted as a response to a context in which we already know what Ana did not eat but we want to know what she did eat (cf. **marusicetal2015**). While interesting, we are leaving this reading aside here.

3 Wh-phrases, discourse particles and... what else?

While we have only considered particles thus far, we also need to consider instances of the so called contrast sluicing, i.e. cases “where the correlate is a focused definite expression, rather than an indefinite” (*vicenteoupsluicing*: 12). We can find contrast sluicing in English as well (*merchant2001*: 36):

- (22) a. She has five cats, but I don't know how many dogs.
b. We already know which streets are being repaved, but not which avenues.

(*merchant2001*: 36, (81a,d))

Cases just like these exist in Slovenian, too, and in Slovenian, just as in English, the wh-phrase and the “contrast” can form a complex wh-phrase:

- (23) a. Ima pet mačk, ne vem pa koliko psov.
have.3SG five cats not know but how.many dogs
'(S)He has five cats, but I don't know how many dogs.'
- b. Vemo, katere ulice bodo ponovno tlakovane, a ne, katere
know.1PL which streets AUX again paved but not which
avenije.
avenues
'We know which streets are being repaved, but not which avenues.'

However, the availability of complex wh-phrases in sluicing in Slovenian, does not account for instances of discourse particles in sluicing, as already observed in *marusicetal2015*. That is, based on the observations that discourse particles in Slovenian (i) can be separated from the wh-word by parentheticals, shown below for *pa* in a wh-question and a sluice, (24) and (25a), respectively, (ii) can appear after the auxiliary clitic, cf. example (12b) and (20b), which in Slovenian does not break syntactic constituents and (iii) that particles cannot appear with unmoved wh-phrases, *marusicetal2015* conclude that in Slovenian, discourse particles do not form a constituent with wh-phrases.

- (24) Kaj, po tvoje, pa kuha?
what after yours PA cook
'What, in your opinion, is he cooking?'
- (25) a. Ana je nekaj pojedla.
Ana AUX something ate
'Ana ate something.'

- b. Kaj, po tvojem mnenju, pa je—pojedla?
 what after your opinion PA AUX ate
 ‘What, in your opinion did she eat?’

In fact, the same conclusion can be made based on examples that show that the same particle cannot appear after all wh-phrases in multiple sluicing in Slovenian. That is, while multiple sluicing by itself is acceptable in Slovenian (a multiple wh-fronting language) and while particles can only marginally appear after each of the wh-phrases in multiple sluicing, these have to be different particles (we are not discussing the particle *to* here, but see marusicetal2015); compare (27b) with (27e). Imagine a context in which you lend your glasses to a friend who had a party and the next day, the friend comes by to explain the situation and you demand to know:

- (26) Na zabavi je nekdo nekomu metal kozarce in jih
 on party AUX somebody.NOM somebody.DAT throw glasses and them
 razbil.
 broke
 ‘At the party, somebody threw glasses at somebody and broke them.’
- (27) a. Kdo komu?
 who.NOM who.DAT
 ‘Who (threw the glasses) to whom?’
- b. *Kdo pa komu pa?
 who.NOM PA who.DAT PA
- c. Kdo komu pa?
 who.NOM who.DAT PA
 ‘(I want to know) Who (threw the glasses) to whom?’
- d. Kdo pa komu?
 who.NOM PA who.DAT
 ‘(I want to know) Who (threw the glasses) to whom?’
- e. ?Kdo pa komu to?
 who.NOM PA who.DAT TO
 ‘(I want to know) Who (threw the glasses) to whom?’

If particles would form a constituent with each individual wh-phrase prior to movement, we would expect (27b) to be just as acceptable as (28b) in which the sluice consists of two complex wh-phrases that only differ in their case features. But as shown, this is not the case.

- (28) a. En slikar je drugega naslikal.
one painter AUX other painted
'One painter painted the other one.'
- b. Kateri slikar katerega slikarja?
which painter.NOM which painter.ACC
'Which painter which painter?'

This can then be taken as an additional argument against particles forming a constituent with the wh-phrase and shows that instances of sluicing with discourse particles are not simply parallel to cases in which a complex wh-phrase survives sluicing. But, crucially, this shows that discourse particles in wh-questions in Slovenian are not located within the wh-phrase.

Furthermore, in Slovenian 'contrast' sluices are not necessarily complex wh-phrases, but rather consist of a wh-phrase (simplex or complex) and a non-wh-phrase. Even more, this non-wh-phrase can be discourse given, (29), or new, (30).

- (29) a. Srečala sem Vida in Črta. Vid je bil z Ano.
met AUX Vid.ACC and Črt.ACC Vid.NOM AUX was with Ana.INS
'I met Vid and Črt. Vid was accompanied by Ana.'
- b. In s kom Črt?
and with who Črt.NOM
'And Črt was with whom?'
- (30) a. Ne spomni se, kje je Nik spoznal Majo?
not remember REFL where AUX Nik.NOM met Maja.ACC
'(S)He doesn't remember where Nik met Maja.'
- b. Ne, kje Kekec Mojco.
no where Kekec.NOM Mojca.ACC
'No, (s)he can't remember where Kekec met Mojca.'

Based on similar examples, marusicetal2015 suggest that in sluicing in Slovenian, the non-wh-material in the left periphery is not elided but we can in turn take it as an indicator that the particles do not have to form a constituent with the wh-phrase in sluicing examples. In the next section, we maintain the analysis from marusicetal2015 and focus on the position of discourse particles in Slovenian wh-questions and in doing so give new arguments for the proposed analysis.

4 Position of particles

While particles are well studied in some languages, for example in German, particles in wh-questions have not been previously studied in Slovenian (at least not within the generative framework). In what follows we focus on the position of particles *že* and *pa* in Slovenian wh-questions. Focusing on examples with sluicing we show that the particles are not a part of the clitic cluster in Slovenian, despite their lack of stress and what at first glance seems to be simply a clause second position. Furthermore, we take instances of particles in sluicing as evidence that these particles are not a part of the IP.

4.1 Discourse particles are not part of the clitic cluster

Traditionally discourse particles *pa* and *že* are said to be part of the clitic cluster in Slovenian, specifically, **toporisic2000** places them as the last clitics of the clitic cluster. Similarly, **oresnik1985naniz** suggests that at least one variety of the particle *pa* should be seen as part of the clitic cluster. **toporisic2000** does not make any distinction between various types of particles *pa* and *že*, he considers all of them comparable to the negation clitic *ne* and other particles like *še* ‘more’/‘still’, *da* ‘that’/‘yes’, etc. If particles are part of the clitic cluster and if clitic cluster is a conglomeration of syntactic heads that is adjoined to the C head (as in **goldensheppard2000**), we would expect, contrary to fact, that particles would behave like clitics and should thus, just like other clitics within the same cluster, not be possible in sluicing, as shown in (31).

- (31) Ilija mu ga nekje razлага. Kje že (*mu ga)?
 Ilija him it somewhere explains where ŽE him it
 ‘Ilija is explaining it to him. (Remind me) Where (is Ilija explaining it to him)?’

Given the assumptions explained above and the example (31) we cannot but conclude that the particles that we observe in sluicing in Slovenian must be DP-internal, while the particles that we observe in wh-questions originate from a position inside the IP, as the complementizer is the first clitic inside the clitic cluster. This goes against the findings of **marusicetal2015** and our own conclusions about the nature of these particles in sluicing and wh-questions. Our goal now is thus to show that the “cluster-final” particles are not truly part of the clitic cluster and that additionally, the (mainstream) assumptions about clitic placement explained above also need to be (at least partially) revised or discarded.

First, as claimed by **marusic2008clitics**, clitics forming the clitic cluster are not adjoined to C as they can easily appear following a word that should be located lower in the clause (cf. **boskovic2001** for BCS clitics). **oresnik1985naniz** gives another argument against placing the clitic cluster in the C head. As he puts it, the complementizer should not be seen as a part of the clitic cluster as focused phrases can split the complementizer from the rest of the clitic cluster, as in (32b) taken from **oresnik1985naniz**.

- (32) a. ... {in / ker / da} si ga Janez lahko kupi.
and as that REFL it Janez can buy
'... {and / as / that} Janez can buy it.'
- b. ... {in / ker / da} JANEZ si ga lahko kupi.
and as that Janez REFL it can buy
'... {and / as / that} Janez can buy it.'

If clitics move in overt syntax, than the clitic cluster that is apparently not adjoined to C needs to be hosted by a lower head – a head within IP. So for the particle at the end of the clitic cluster that would mean its place of origin should also be somewhere inside the IP, which further suggests our analysis is simply wrong. We can dismiss this argument saying Slovenian clitics do not move in syntax (as suggested by **marusic2008clitics** and **marusiczaucer2017brno**) or that at least the clitic cluster is not composed in syntax, for which there also seems to be evidence given that the order of clitics inside the cluster is not universal and does not follow any order predicted by the assumed structure (cf. **marusiclecturenotes**), but let us try and argue against the cluster-internal position of the discourse particles also within the mainstream view on clitics.

As noted above, the two particles *že* and *pa* can actually appear either before or after the clitic cluster, as shown in (20b) for *pa* and in (12b) for *že*, and in (33) for both. Given that all other clitics forming the clitic cluster have a fixed word-order (with some variation in the order of dative and accusative clitics), we can conclude that the two clitics are not part of the clitic cluster but appear either cluster-initially or cluster-finally by accident.

- (33) a. Koga {že mu je / mu je že} Ilija predstavil?
who že him AUX him AUX že Ilija introduced
'(Remind me) who did Ilija introduce to him?'
- b. Kaj {pa mu je / mu je pa} Žodor narisal?
what PA him AUX him AUX PA žodor drew
'What did Žodor draw for him?'

Another argument given above to show these particles do not form a constituent with the wh-word can be turned around. As shown in (24) repeated here as (34), *pa* can follow the parenthetical ‘in your opinion’, but note that *pa* can also precede the parenthetical and appear on the other side of the parenthetical separated from the rest of the clitic cluster, (35). This suggests *pa* is an element independent from the clitic cluster that is located structurally higher than the final position of the clitic cluster.

- (34) Kaj, po tvoje, pa kuha?
What after yours PA cook
'What, in your opinion, is he cooking?'
- (35) Kdo pa, po tvojem mnenju, jih je komu metal?
who PA after your opinion them AUX who.DAT threw
'Who, in your opinion, threw them for whom?'

Further, in some cases, *pa* and *že* can appear also inside the complex wh-phrase as in (36) and (37). Note that these examples do not constitute an argument for a wh-phrase-internal position of these discourse particles, as argued by marusicetal2015, but they do suggest that these discourse particles are different syntactic elements from the clitics forming the clitic cluster.

- (36) Kaj že dobrega je Ana pojedla?
what že good AUX Ana ate
'(Remind me) What was it that Ana ate that was good?'
 - (37) Kdo pa od Petrovih prijateljev je prišel?
who PA of Peter's friends AUX came
'Who of Peter's friends was it that came?'
- (marusicetal2015)

And finally, clitics in Slovenian typically follow the first wh-phrase of a multiple wh-question, (38), while discourse particles can follow the first or second wh-phrase in a multiple wh-question with two wh-phrases, as examples in (27) show.

- (38) Kdo {jih je komu / *komu jih je} metal?
who.NOM them AUX who.DAT who.DAT them AUX threw
'Who threw them to whom?'

Given all that, regardless of our assumptions about clitics and the way clitic cluster is formed, discourse particles are syntactic elements that behave differently

from clitics, so that we have no argument to posit they originate from the same region of the clause or that their surface position is in any way dependent on the surface position of the other clitics. Discourse particles and clitics behave differently in wh-questions, thus it is not unexpected that they behave differently also in sluicing.¹⁴

4.2 Position of particles with respect to adverbs

An argument for the analysis that places discourse particles in the left periphery of a wh-question (and a sluice) comes from the behavior of adverbs. Specifically, the incompatibility of high sentential adverbs and sluicing in Slovenian. There are several suggestions with respect to the position of discourse particles. zimmermann2011 proposes that, perhaps universally, discourse particles tend to be realized in the periphery of the clause, but that some languages, such as German, should be exempt from this (i.e. in German discourse particles do not occur in the periphery but rather in the middlefield because they do not bare stress and unstressed elements cannot appear in the prefield in German).¹⁵ Facts from sluicing in Slovenian in fact suggest that discourse particles do appear higher than high sentential adverbs.

Specifically, high sentential adverbs in cinque1999's (cinque1999) hierarchy of adverbs express speakers' attitude and are in this respect similar to discourse particles which express speakers' attitude towards the utterance (zimmermann2011).

¹⁴ An anonymous reviewer suggested our data are fully compatible with a view where the only relevant criterium for clitic cluster formation is PF adjacency. If we further assume pronominal and auxiliary clitics are IP clitics whereas discourse particles are CP clitics (as they are located in the left periphery – in the CP area), then IP clitics and CP clitics would have been adjacent at PF in the absence of sluicing, but they would have never been syntactically adjacent or part of the same complex head. And when sluicing would elide the IP, IP clitics would get deleted whereas CP clitics would survive.

¹⁵ ott2016deletion, assuming that particles in German are located outside the vP, above sentential adverbs and negation, argue for a phonological approach to ellipsis in which material, which is in the background, is elided. This approach does not necessarily require movement. Crucially, ott2016deletion show that in German sentential adverbs can appear in clausal ellipsis, contrary to Slovenian. This implies that while cases of sluicing with particles in Slovenian and German seem similar at first glance, the two are in fact different.

- (i) *Context:* ‘Peter seems to have invited some people.’
Und WEN {vermutlich / wahrscheinlich / anscheinend}?
and who presumably probably apparently
'And who did he {presumably / probably / apparently} invite?'
(ott2016deletion: (15b))

However, while particles can appear in sluicing in Slovenian, high sentential adverbs cannot. This is shown below for the adverb *menda* ‘allegedly’ (but the same is true for *baje* in non-standard varieties of Slovenian) – a relatively high adverb that is compatible with wh-questions (that is, while seemingly higher adverbs such as *iskreno* ‘frankly’ can appear in wh-questions, they only receive subject oriented reading).

- (39) Kdo je menda plesal tango?
who AUX allegedly danced tango
'Who allegedly danced tango?'
- (40)
 - a. Kdo že je menda plesal tango?
who ŽE AUX allegedly danced tango
'(Remind me) Who allegedly danced tango?'
 - b. Kdo je že menda plesal tango?
who AUX ŽE allegedly danced tango
Available: '(Remind me) Who allegedly danced tango?'
Available: 'Who allegedly already danced tango?'
 - c. Kdo je menda že plesal tango?
who AUX allegedly ŽE danced tango
'Who allegedly already danced tango?'
- (41) Context: 'I've heard that there are some people here who danced tango.'
 - a. Kdo že?
who ŽE
'(Remind me) Who?'
 - b. * Kdo menda?
who allegedly
Intended: 'Who, allegedly?'

First, the examples in (40) indicate that discourse particles precede high sentential adverbs in wh-questions in Slovenian, since *že* only gets the aspectual reading when it follows an adverb such as *menda* ‘allegedly’. More importantly, high sentential adverbs cannot appear in sluices in Slovenian, indicating that the material in the IP is elided.¹⁶ And since particles can appear in sluicing, this suggests that discourse particles in wh-questions in Slovenian are located above the IP.

¹⁶The apparent exception are contrastively focused adverbs as example (i) shows:

(i) A: 'I know Kekec danced for sure.'

5 Conclusion

Discourse particles in wh-questions in Slovenian have not been previously studied in Slovenian within the generative framework. In this paper we take instances of sluicing in which discourse particles *pa* and *že* appear as a starting point to explore discourse particles in wh-questions (and consequently sluicing) in Slovenian. We consider cases with *že* and *pa* in wh-questions and sluicing to show that discourse particles in Slovenian are not in complex wh-phrases nor are they a part of the clitic cluster or the IP. In fact, all of the properties we explore in this paper can be captured under the analysis proposed in marusicetal2015, i.e. an analysis according to which discourse particles are located in the left periphery. Under this approach the projections hosting wh-phrases are not the only projections surviving sluicing in Slovenian, but rather what survives sluicing is a larger portion of the left periphery, hence also the grammaticality of topic and focus phrases in sluicing in Slovenian.

A natural question that follows (also pointed out by one of the anonymous reviewers) is why particles can survive IP-deletion in the left periphery, while auxiliaries like *did* and *do*, which end up in the left periphery following T-to-C movement, do not. The elements that we observe survive sluicing in the left periphery all originate from within the left periphery, while English auxiliaries do not; they are moved to the left periphery via T-to-C movement. One option to resolve this question is to simply state that the deletion of the IP in sluicing precedes T-to-C movement, as a result of which the auxiliaries never even reach the C head, where it could survive sluicing. As T-to-C movement is an instance of head-movement and as head-movement is occasionally argued to be an instance of PF movement, it actually follows quite naturally that elements like *did* cannot survive sluicing, as they do not occupy a left-peripheral position at the time when the IP is deleted.

B: In kdo MENDA?
and who allegedly
'And who (danced) allegedly?'

Abbreviations

1	1st person	INS	instrumental
3	3rd person	NEG	negation
ACC	accusative	NOM	nominative
AUX	auxiliary verb	PL	plural
COND	conditional auxiliary	PTCL	discourse particle
DAT	dative	Q	question marker
GEN	genitive	REFL	reflexive pronoun
INF	infinitive	SG	singular

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Chapter 10

The markedness of coincidence in Russian

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This paper presents a novel analysis of the Russian Infl domain. Specifically, it is argued in this paper that in Russian, the past tense, as opposed to the non-past, is the default, unmarked tense. Consequently, non-past in Russian is marked by the specification of a privative feature on T^0 , which associates the event/state expressed by vP to some anchoring time. This analysis stems from observations of how subjunctive matrix and complement clauses are interpreted. The analysis captures how, unlike other languages with the subjunctive mood, Russian allows main independent clauses to appear in the subjunctive. It additionally furthers work on features and properties of the Infl domain, showing how languages use different features, from what appears to be a limited set, to express time and realis contrasts.

Keywords: Russian, tense, subjunctive, Infl, realis and irrealis moods

1 Introduction

This study examines the morphosyntactic features of the Russian inflectional domain by focusing on the selectional properties of the Russian subjunctive. Traditionally, the subjunctive is held to be a mood (whether or not there is overt morphology) that expresses an eventuality as hypothetical, advisable, desirable, or obligatory with respect to the sentential subject (**HarrisonLeFleming2000**). In Russian, the subjunctive mood is expressed with the particle *by* and typically with the past-tense form of the predicate.

- (1) Ty uš-l-a by domoj.
 you leave-PST-SG.F BY home.
 'You would {go / have gone} home.' (Mezhevich 2006: 152)

Despite co-occurring almost exclusively with the past-tense verb form, however, constructions containing *by* show no semantic tense contrasts whatsoever (Spencer 2001: 298). This is illustrated in (2), where past, present, and future-oriented temporal adverbs are shown to licitly co-occur with the past tense verb form when *by* is present.

- (2) Ja **by** uexa-l-a {včera / sejčas / zavtra}.
I BY leave-PST-SG.F yesterday now tomorrow
'I would {have left yesterday / leave now / leave tomorrow}'
(Mezhevich 2006: 136)

By can also co-occur with the infinitive form of the verb in an independent matrix clause.

- (3) Oj s"est' **by** Pete {včera / zavtra} jabloko!
oh eat.IMP BY Peter.DAT yesterday tomorrow apple
'If only Peter would eat an/the apple tomorrow!' or
'If only Peter would have eaten an/the apple yesterday'
(Asarina 2006: 10)

Non-past finite forms of the predicate, on the other hand, are completely illicit with *by*.

- (4) a. * Ja propuskaj-**u** **by** ètot doklad.
I miss.IPFV/PRS-1SG BY this talk
Intended: 'I would skip this talk.'
b. * Ja ujd-**u** **by** domoj.
I leave.PFV/FUT-1SG BY home
Intended: 'I would go home.' (adapted from Mezhevich 2006: 133)

This study stems from these observations. It asks: What can these co-occurrence patterns tell us about the interpretable features of the Russian inflectional system? I argue that *by* is the phonological spell-out of an irrealis head in the Russian inflectional domain, whose projection is semantically incompatible with the specification of any feature that situates a clause at the utterance context. Specifically, I will claim that this feature is [Coin(cidence)] (cf. RitterWiltschko2005, RitterWiltschko2009), which is hosted in T. A consequence, and perhaps the main take-away of this proposal is that the contrast between past and non-past

in Russian is distinguished by the specification of [Coin], past tense being the unmarked tense. This proposal is rooted in Distributed Morphology (HalleMarantz1993; EmbickNoyer2007) and builds on the feature geometry work of Cowper (2002; 2005) and others.

The outline of this paper is as follows. In §2, I describe the data considered for the analysis to be presented. It describes the tense system in Russian along with how the subjunctive is expressed in the language. §3 provides a background sketch of the subjunctive mood cross-linguistically and in the literature. In §4, I present an analysis of the data presented in §2. §5 expands the analysis presented to account for Russian subjunctive constructions as complement clauses. Finally, I conclude in §6.

2 The Russian system

In Russian, most verbs come in aspectual pairs (Mezhevich 2008: 371) – an imperfective form and corresponding perfective form – and tense is often defined with respect to aspect (Mezhevich 2008: 373). In the indicative mood (that of “independent main assertive clause type[s]” (Wiltschko)), imperfective aspect allows for temporal distinctions among past, present, and a periphrastic future; perfective only allows for past and future readings (Mezhevich 2008: 371). Among non-past forms, aspect plays a role in distinguishing present from future. The examples in (5) and (6) shows the temporal-aspectual realizations for the verb ‘fall’, illustrating the Russian tense system.

(5) Imperfective		(6) Perfective	
a. On padal.	PST	a. On upal.	PST
he fall.IPFV.PST		he fall.PFV.PST	
‘He was falling.’		‘He fell.’	
b. On padaet.	PRS	b. N/A	PRS
he fall.IPFV.PRS			
‘He is falling.’			
c. On budet padat’.	FUT	c. On upadet.	FUT
he will fall.IPFV.INF		he fall.PFV.PRS	
‘He will be falling.’		‘He will fall.’	

Unlike Modern Russian, Old Russian made a distinction among four past tenses, namely, the aorist, the perfect, the pluperfect, and the imperfect (Mezhevich 2006:

38). Perfect and pluperfect constructions contained an inflected form of *byti* ‘be’ and a form commonly referred to as the L-participle: a verb containing the *-l* suffix. The distinction among the four past tenses was lost over time. What has remained is the *-l* suffix as the sole marker of past tense (*ibid.*).

Although historically it was the case that the *-l* suffix of the L-participle did not mark past tense itself, it has been argued that the suffix has been reanalyzed as the past tense morpheme in Modern Russian (see [Mezhevich 2006](#) for a discussion and references). The form’s distribution and interpretation in Modern Russian contrast with what are considered to be non-past predicate forms. I therefore treat the *-l* suffix that attaches to verbs as the past tense form here. In no way, however, do I assume that it exclusively expresses past tense. As shown in (2) and to be seen in later examples, when *-l* co-occurs with *by*, one interpretation the clause may receive is a past interpretation but in no way is such a construction restricted to that interpretation. A clause containing both these morphemes may also receive non-past readings.

Apart from the indicative, Modern Russian has only two formal moods: the imperative and the subjunctive/conditional ([Cubberley 2002](#): 157). Russian does not have specific subjunctive verb forms ([Mezhevich 2006](#): 118). Rather, subjunctive clauses are generally formed with the particle *by* and the L-participle, as in (5), repeated from (1), and (6).

- (7) Ty uš-l-a by domoj.
you leave-PST-SG.F BY home
'You would go / have gone home.' ([Mezhevich 2006](#): 152)
- (8) Liza xote-l-a, [čtoby Philemon uše-l].
Liza want-PST-SG.F ČTOBY Philemon leave-PST.SG.M
'Liza wanted Philemon to leave.' ([Mezhevich 2006](#): 148)

Traditionally, the subjunctive is held to be a mood (whether or not there is overt morphology) that expresses an eventuality as hypothetical, advisable, desirable, or obligatory ([HarrisonLeFleming2000](#)), as in (7), with respect to the sentential subject.

- (9) a. They would like [to go]. desirability
b. I should [write to my mother]. obligation
([HarrisonLeFleming2000](#))

In Russian, the subjunctive pattern described above is used to express these semantic notions, for example, in (8) and (9).

- (10) a. Vy čita-l-i by gazetu. advisability
 you read-PST-PL BY paper
- b. Vy pro-čita-l-i by gazetu. desirability
 you PFV-read-PST-PL BY paper
- ‘You should (have) read the paper.’ (HarrisonLeFleming2000)
- (11) Zavtra ja s udovol’stviem poše-l by v teatr desirability
 tomorrow I from pleasure go-PST BY at theatre
 ‘I would very much like to go to the theatre tomorrow.’

That is, in (8), the subjunctive is used to express advisability with respect to the subject and in (9), desirability. (8a) and (8b) illustrate that the imperfective-perfective distinction is maintained in the subjunctive mood.

Although *by* derives from the aorist of the Old Russian auxiliary *byti* ‘be’, it has been reanalyzed as a marker of the subjunctive/conditional separate from the Modern Russian form *byt’* ‘be’. The main distinguishing property between *by* and *byt’* is that the latter has a paradigm of inflected forms while the former does not; rather, it is a frozen morpheme (see Spencer 2001; Mezhevich 2006).

In matrix clauses, *by* most naturally appears following the main verb (Cubberley 2002: 200). However, it can also follow a focused element, appearing in the second sentential position (Spencer 2001: 298), as in (10). In theory, though, *by* can occur in any position except clause-initially (Hacking 1998, cited in Mezhevich 2006: 152; Spencer 2001: 298); see (11).

- (12) a. Ja uš-l-a by.
 I leave-PST-SG.F BY
- b. Ja by uš-l-a.
 I BY leave-PST-SG.F
- ‘I would {leave / have left}.’ (Spencer 2001: 298)
- (13) a. Ty **by** uš-l-a domoj.
 you BY leave-PST-SG.F home
- b. Ty uš-l-a **by** domoj.
 you leave-PST-SG.F BY home
- c. Ty uš-l-a domoj **by**.
 you leave-PST-SG.F home BY

- d. * By ty uš-l-a domoj.
BY you leave-PST-SG.F home
(Intended:) ‘You would go / have gone home.’ (Mezhevich 2006: 152)

It was noted in §1 that *by* cannot co-occur with a non-past-tense predicate. This is shown again in (12), repeated from (4).

- (14) a. * Ja propuskaj-u by étot doklad.
I miss.IPFV/PRS-1SG BY this talk
Intended: ‘I would skip this talk.’
b. * Ja ujd-u by domoj.
I leave.PFV/FUT-1SG BY home
Intended: ‘I would go home.’ (adapted from Mezhevich 2006: 133)

Embedded under predicates that license subjunctive clauses, *by* surfaces clause-initially with the indicative complementizer *čto* as a fused form (Brecht 1977).

- (15) Liza xote-l-a, [čtoby Philemon uše-l].
Liza want-PST-SG.F ČTOBY Philemon leave-PST
‘Liza wanted Philemon to leave.’ (Mezhevich 2006: 148)

Like *by* in matrix clauses, *čtoby* never appears with present or future morphology on the predicate.

- (16) a. Maša xočet čtoby Petja s”e-l jabloko.
Maša wants ČTOBY Peter eat.-PFV.PST apple
‘Mary wants for Peter to eat an apple.’
b. * Maša xočet čtoby Petja {est / s”est} jabloko.
Maša wants ČTOBY Peter eat.IPFV.PRS eat.PFV.PRS(=FUT) apple
Intended: ‘Mary wants for Peter to eat an apple.’ (Asarina 2006: 7)

Unlike matrix subjunctive clauses, a past-tense reading is unavailable for a subjunctive complement clause, as shown in (17c); while present and future interpretations are possible, as shown in (17a) and (17b).

- (17) a. Ja xoču, čtoby Maša zavtra s”e-l-a jabloko.
I want ČTOBY Mary tomorrow eat-PST-SG.F apple
‘I want for Mary to eat an apple tomorrow.’

- b. Ja xoču, čtoby Maša sejčas e-l-a jabloko.
 I want ČTOBY Mary now ate-PST-SG.F apple
 'I want for Mary to be eating an apple right now.'
- c. *Ja xoču, čtoby Maša včera s"e-l-a jabloko.
 I want ČTOBY Mary yesterday eat-PST-SG.F apple
 Intended: 'I want for Mary to have been eating an apple yesterday.'
 (Asarina 2006: 8)

In the case that the subjects of the complement and matrix clauses are coreferential, however, the subordinate predicate appears in its infinitival form (Cubberley 2002: 160, 236), as shown in (16). When the subjects of the complement and matrix clauses have disjoint reference, the subordinate clause appears with the complementizer *čtoby* and the past tense form of the embedded verb, as in (17). The disjoint reference requirement for the subject of the embedded subjunctive clause with respect to the subject of the matrix clause is called "subject obviation" (cf. Antonenko 2010: 1).

- (18) a. Ja xoču poj-ti domoj.
 I want.PRS.1SG go-INF home
 'I want to go home.'
- b. My xote-l-i éto sdelat' zavtra.
 we want-PST-PL this do.INF tomorrow
 'We wanted to do that tomorrow.' (HarrisonLeFleming2000)
- (19) a. Ja xoču, čtoby on poše-l domoj.
 I want.PRS.1SG ČTOBY he go-PST home
 'I want him to go home.'
- b. My xote-l-i čtoby vy éto sdelal-i zavtra.
 we want-PST-PL ČTOBY you this do-PST-PL tomorrow
 'We wanted you to do this tomorrow.'

Matrix subjunctives, though, do not differ semantically regardless of whether the predicate appears with past morphology or in the infinitive (Asarina 2006: 10). Note, however, that the subject of the clause appears in its nominative form when the verb appears with *-l* but in its dative form when the verb is infinitival.

- (20) a. Oj s”e-l by Petja {včera / zavtra} jabloko!
oh ate-PST BY Peter.NOM yesterday tomorrow apple
'If only Peter would eat an/the apple tomorrow!' or
'If only Peter would have eaten an/the apple yesterday!'
b. Oj s”est’ by Pete {včera / zavtra} jabloko!
oh eat.INF BY Peter.DAT yesterday tomorrow apple
'If only Peter would eat an/the apple tomorrow!' or
'If only Peter would have eaten an/the apple yesterday!'

(Asarina 2006: 10)

The following section outlines properties of the subjunctive mood from a cross-linguistic perspective.

3 The subjunctive mood

The subjunctive mood contrasts minimally with the indicative (Quer 2006: 660; Wiltschko). However, neither cross- nor intra-linguistically does the subjunctive mood constitute a uniform category (Quer 2006: 661). Some subjunctive-related phenomena are present in some languages but absent in others that have the mood (*ibid.*). For example, Icelandic subjunctive clauses allow long-distance anaphors while Upper Austrian German subjunctive clauses do not (*ibid.*). Further, within a single language that has the subjunctive mood, there are subjunctive-related phenomena that are evident in some subjunctive clauses but not all (*ibid.*).

The subjunctive has frequently been considered a defective tense (e.g. Picallo 1984 and Giannakidou 2009) or at least impoverished semantically with respect to the indicative (see Cowper 2002; Cowper 2005; Schlenker 2005). As a completely defective tense, the subjunctive is claimed to be dependent on some higher structure for its temporal interpretation (Wiltschko). Proposals of this sort stem from the fact that in some languages (e.g. Spanish and Catalan), subjunctives cannot be used in matrix clauses; in these same languages, where the subjunctive appears in a complement clause, the time of the embedded clause is interpreted relative to that of the matrix clause (Wiltschko).

A problem that has been noted concerning the idea that the subjunctive is a defective tense/impoverished morphosyntactically is that there are languages that have been argued to lack tense but have an active indicative-subjunctive distinction (Wiltschko). For example, Wiltschko demonstrates that in Upper Austrian

German, there is no dedicated form for the simple past tense and the bare verb in the indicative is compatible with a past, present, or future interpretation.

- (21) a. I **koch** grod. present
I cook now
'I am cooking right now'
- b. I **koch** gestan. past
I cook yesterday
'I was cooking yesterday.'
- c. I **koch** moagn. future
I cook tomorrow
'I will cook tomorrow.' (Wiltschko)

Wiltschko argues that in Upper Austrian German there is a subjunctive–indicative contrast active where a tensed language, for example Standard German, would employ the past-non-past distinction. For example, as shown in (20), subjunctive morphology appears on the verb, closer than agreement marking.

- (22) a. Nua du kumm-at-st.
only you come-SBJ-2SG
'Only you would come.'
- b. Nua es kumm-at-ts.
only you.PL come-SBJ-2PL
'Only you guys would come.' (Wiltschko)

Wiltschko claims that the subjunctive-indicative contrast is how the language anchors its clauses. This is evident from the fact that the subjunctive may be used in main independent clauses in Upper Austrian German, and therefore: a) subjunctive clauses are temporally independent, and b) the subjunctive does not create a transparent clause. The proposal, following **RitterWiltschko2005; RitterWiltschko2009**, is that Infl, the locus of clausal anchoring, contains a [Coin(cidence)] feature which establishes a relation of either overlap or coincidence between Infl's two arguments (in the case of [+Coin]) or disjointness (as in the case of [-Coin]). It is the substantive (a.k.a. semantic) content of the morphology that determines the relation between Infl arguments, for example, time. In the case of Upper Austrian German, subjunctive marking values the [*u*Coin] feature in Infl as [-Coin], while indicative marking values it as [+Coin].

The negatively valued [Coin] feature of **RitterWiltschko2005; RitterWiltschko2014** roughly corresponds to **Iatridou**'s (2000) exclusion feature: ExclF. ExclF can range over times or worlds and has the basic meaning presented in (21).

- (23) ExclF: $\tau(x)$ excludes $c(x)$,
where $\tau(x)$ means $\text{TOPIC}(x)$ (“the x that we are talking about”) and $c(x)$ means $\text{CONTEXT}(x)$ (“that x that for all we know is the x of the speaker”)
- a. Ranging over times, $\tau(t)$ is the set of times under discussion and $c(t)$ is the set of times that for all we know are the times of the speaker (i.e. the utterance time). What this yields is the interpretation: The topic time excludes the utterance time.
 - b. Ranging over worlds, the interpretation the ExclF yields is: The topic worlds exclude the actual world.

(Iatridou 2000: 246)

Essentially, ExclF and the negatively valued [Coin] feature share the property of establishing that two elements are disjoint.

The analysis to be presented in this paper adopts the feature proposed by RitterWiltschko2005; RitterWiltschko2009, however as a privative interpretable feature of Infl. It also employs Cowper’s (2002; 2005) feature geometry of interpretable Infl features. It will also be explained how ExclF, bearing basically the opposite semantics of [Coin], would be less parsimonious in accounting for the behaviour exhibited by the Russian subjunctive. To give away the punch-line, what surfaces is the claim that in Russian, the past tense is morphosyntactically unmarked (non-past being the marked tense) and the Russian subjunctive involves the spell-out of an irrealis head in Infl that is incompatible with the morphosyntactic specification of [Coin].

4 The proposal

I argue in this section that *by* is an irrealis particle that spells out the head of a functional projection IrrP, which merges with TP in a fully articulated Infl structure. Despite proposing IrrP as a modified version of Cowper’s (2010) MP, I make no claims here about modal operators in Russian subjunctive clauses or subjunctive clauses in general.

4.1 Theoretical framework

The analysis to be presented adopts the inflectional system proposed by Cowper (2010), based on the feature geometry of the inflectional domain proposed in Cowper (2005). Her framework and the one presented here are rooted in Distributed Morphology (DM) (HalleMarantz1993; EmbickNoyer2007; Bobaljik), a

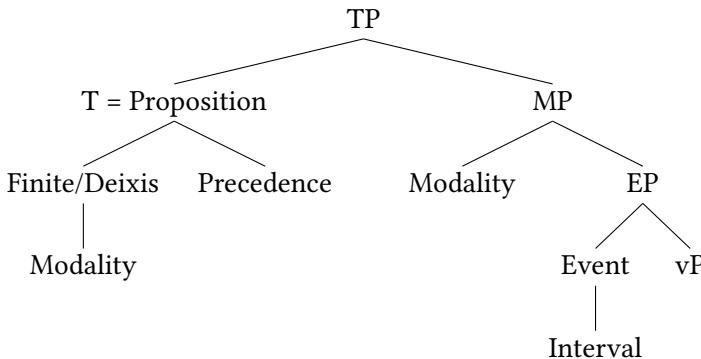


Figure 1: English Infl domain (Cowper 2010: 2)

theoretical approach according to which the syntax operates on feature bundles (i.e. lexical items or LIs) taken from the lexicon, combined in terminal nodes. Vocabulary items (or VIs) spell these features out at the phonological interface.

The interpretable, privative features of the Infl domain proposed by Cowper (2005) are divided according to mood, narrow tense, and viewpoint aspect, as shown in (22), where α and β are features in a dependency structure, in $\alpha > \beta$, β is a dependent of α .

- (24) Mood: [Proposition] > [Finite/Deixis] > [Modality]
 Narrow tense: [Precedence]
 Viewpoint aspect: [Event] > [Interval] (Cowper 2010: 1)

The proposed dependency structure from Cowper (2010) for the English Infl domain is provided in Figure 1.¹

The specification of [Proposition] contrasts propositions from bare events or states. [Finite] is a syntactic feature that licenses nominative case and verbal agreement. [Deixis] anchors a clause to the moment of speech. [Modality] carries the semantics of necessity or possibility. [Precedence] encodes the meaning of past versus non-past. [Event] encodes the eventive (as opposed to stative) property of a predicate. Finally, the specification of [Interval] derives imperfectionity versus perfectivity. These features are realized on multiple functional heads which together constitute the inflectional domain of the clause.

Under Cowper's proposal, English modals merge in M(od) and subsequently move to T. TP, accordingly, is the projection of the feature [Proposition] given that only in propositions may the past/non-past distinction be realized. The viewpoint aspect features are realized in EP, which is not projected in stative clauses

¹While Cowper (2010) proposes heads higher than TP, only the projections relevant to the present proposal are provided here.

(Cowper 2010: 2). Moreover, the EPP is a property of the domain as a whole and is instantiated by the highest Infl head projected.

I assume here the TP, MP, and EP projections from Cowper (2010) along with the features [Finite], [Modality], and [Event]. [Modality] in my proposal is semantically impoverished in relation to its original proposal: (i) to avoid making any claims about subjunctivity and some relation with modality and (ii) because the semantics of *by* allows for modal interpretations within a superset of additional unrealis readings. I therefore refer to it simply as IrrP, projected by the instantiation of [Irrealis]. Another difference between the feature geometry proposed here and that of Cowper's is that I follow RamchandSvenonius2014, assuming that propositional content is encoded higher in the clause, namely in the CP domain, rather than within Infl. For RamchandSvenonius2014, clauses are comprised of event (VP), situation (TP), and proposition (CP) domains, with transitional projections establishing relations among the domains. Specifically, AspP – essentially Cowper's (2010) EP – establishes a relation between the v/VP and TP, where an event is converted to a situation, while FinP (the lowest projection in Rizzi's (1997) split CP) establishes a relation between TP and CP, where a situation is converted to a proposition. It is in the CP that the propositional content of the clause becomes anchored to the utterance context, since that is the domain where speaker-oriented parameters reside. The diagram in Figure 2 shows these domain associations.

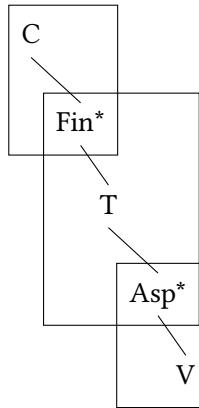


Figure 2: Domains & transitional projections
(RamchandSvenonius2014)

I will claim that whereas past is marked relative to non-past in English, the opposite holds in Russian. That is, whereas past in English is the spellout of (mini-

mally) [Precedence], Russian does not have [Precedence] in its Infl feature inventory. Rather, Russian has the feature [Coin] (RitterWiltschko2005; Wiltschko; Wiltschko 2014) as a dependent of [Finite], and does not have [Deixis].^{2,3} Unlike in Wiltschko, as was previously described, however, [Coin] is a privative feature. Moreover, while [Deixis] establishes an anchor to the utterance time relative to which [Precedence] situates the event, I claim that [Coin] anchors a proposition to the utterance context temporally within the Infl domain and personally (to the speaker) within the C domain. As a feature in Force, the head that hosts complementizers like English *that* and provides information about clause type, [Coin] associates the clausal content to the speaker's perspective.

4.2 The Infl system in Russian

Adopting the tools from Cowper (2005; 2010), I propose the fully articulated dependency structure in Figure 3 for the Russian Infl system. Note that here, as mentioned above, [Irr] heads its own projection rather than being part of T, unlike in Cowper (2010) (note that my Irr corresponds to Cowper's Mod). I assume that a functional head cannot be projected in the absence of any specified features. Thus, while for Cowper, the lexical properties of modals also reside in Mod, I take Irr to be a purely functional head, merged only when [Irr] is specified. This is where a modal particle such as *by* in Russian is merged. Similarly, T is the projection of the feature [Fin(ite)].

The fact that the Russian subjunctive is compatible only with the past marker *-l* or the infinitive results from the selectional requirements of the functional heads in the Infl system. As stated earlier, I assume, based on RamchandSvenonius2014, that the Infl domain temporally situates an event, while the C domain anchors the situation personally, both with respect to the utterance context.

As in Cowper (2010), EP is projected in non-stative clauses, selecting the vP. It is in E that non-derivational aspectual affixes reside. TP hosts the features [Fin] and [Coin]. [Fin] is the locus of nominative case and agreement. [Coin] establishes coincidence between the event described by the vP and the temporal properties of the utterance context. Russian, I claim, lacks any tense features.

²The difference between [Deixis] and [Coin] lies in [Deixis] having been proposed as a feature that in English links temporal and speaker properties to the utterance context, whereas what [Coin] associates to the utterance context depends on where in the syntactic spine it is specified à la RamchandSvenonius2014.

³[Interval], I claim, is also absent in Russian. Instead, the feature [Atomic] is a dependent of [Event], as I have argued based on the fact that stative predicates in Russian cannot bear non-derivational perfective morphology. See Melara (2014) for further discussion.

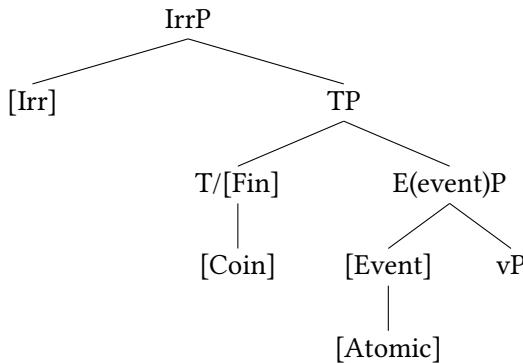


Figure 3: Russian Infl dependency structure

Instead, the past/non-past distinction is attributable to the presence or absence of [Coin]. Specified in Infl – the temporal domain – [Coin] semantically situates the event described by the clause to a non-past time and is spelled out by non-past morphology. Both T and E bear a strong uninterpretable V feature [*uV*], requiring that v, containing V, move up at least to T to satisfy and check the [*uV*] of each head locally. I propose that in Russian, when [Coin] is absent, the past suffix *-l* is spelled out on the verb. That is, *-l* spells out a T specified only for [Fin], hence the past tense morpheme being unmarked relative to the non-past.

The [Irr] feature that *by* spells out encodes irrealisness. The irrealis meaning of [Irr] is semantically at odds with the binding established by [Coin]. When IrrP is projected, [Irr] scopes over the entire Infl domain (but cf. Cowper 2010 for discussion on how NegP is the highest projection in Infl) and essentially has the semantics of ExclF scoping over times, proposed by Iatridou (2000). As described in §3, ExclF is equivalent to [-Coin] from RitterWiltschko2005's (RitterWiltschko2005; RitterWiltschko2014) proposals. Thus, under an analysis according to which [Coin] is a privative feature, its specification coincides with the [+Coin] valuation and the anchoring of the proposition described by the clause to the utterance context. In case [Irr] and [Coin] were to be specified together, the Infl domain would be specified, in essence, for both [-Coin] and [+Coin]. If the Infl domain is what indicates whether an eventuality is anchored to the utterance context (temporally) as a whole, it cannot be both necessarily associated with and not associated with the utterance context, which is what specifying both + and - values for [Coin] would entail. Overall, there must be agreement within the domain with respect to the clause's association to the utterance context. Therefore, while Irr must check its [*uV*] feature, it cannot do so if [Coin] is specified on T.

On the other hand, Irr may freely merge with a TP lacking [Coin]. In this case, *by* is spelled out with past morphology on the verb.

The well-formedness of *by* with the infinitive form of the verb is predicted in a similar fashion. In the absence of TP, Irr may merge directly with EP, satisfying its requirements for [*uV*]-checking in the same way as it would have in being merged with TP. As long as [Coin] is absent, Irr can freely merge with EP (or vP for that matter). Observe that the absence of [Fin] – whose specification licenses nominative case assignment and agreement – would predict that the subject not appear in its nominative form and the infinitive form of the verb would arise without subject agreement marking. This prediction is borne out, at least with respect to case assignment. Note again in the following example, repeated from (18), that the matrix clause containing *by* and the *-l* suffix contains a subject in the nominative case. Conversely, the construction with *by* and the infinitive form of the verb contains a dative subject.

- (25) a. Oj s”e-l by Petja {včera / zavtra} jabloko!
 oh ate-PST BY Peter.NOM yesterday tomorrow apple
 ‘If only Peter would eat an/the apple tomorrow!’ or
 ‘If only Peter would have eaten an/the apple yesterday!’
- b. Oj s”est’ by Pete {včera / zavtra} jabloko!
 oh eat.INF BY Peter.DAT yesterday tomorrow apple
 ‘If only Peter would eat an/the apple tomorrow!’ or
 ‘If only Peter would have eaten an/the apple yesterday!’

(Asarina 2006: 10)

Recall that the subject surfaces in a position higher than *by*. I assume that the EPP property holds of the highest head in the Infl domain. I make no commitment to any particular version of the EPP; for our purposes, it simply requires that the external argument appear in the specifier of the highest Infl head. I conjecture that the external argument may move to the specifier of T, where it receives case and values the uninterpretable phi-features of T. It may then move on further to the specifier of Irr, where it satisfies the EPP. In BY+infinitive constructions, TP is absent, hence the lack of agreement on the verb.

I speculate that Irr, when [Irr] is specified, bears some sort of feature that is optionally strong, allowing for the various available positions of *by* within the clause. It is unclear what exactly this feature is and why it optionally takes the verb or the VP more locally. An alternative explanation would be that *by* is phonologically a clitic, which would capture why the form cannot appear clause-initially. In fact, there is no generally accepted theory of Russian word order as

of yet (see KallestinovaSlabakova2008 and Bailyn 2011 for discussion), with subjunctive data muddying the waters even more. What the reader, I hope, has been convinced of is that *by* spells out a head in the Infl domain. The form interacts directly with Infl categories/properties, namely tense and finiteness, both in terms of distribution and interpretation. If *by* were to spell-out a feature in the CP domain, one would expect it to licitly appear clause-initially, which it can't. While I have discussed only SVO-ordered clauses, work on *by* in other word orders would shed light on *by*'s position variability.

In summary, *by* is incompatible with the non-past tense because the non-past morphology spells out the feature [Coin], which itself is semantically at odds with the lack of connection to the utterance context encoded by [Irr], which *by* spells out. It is the lack of [Coin] in infinitival constructions that allows them to appear with *by*. Table 3 lists the featural specifications of the indicative and subjunctive possibilities that have been discussed.⁴

Table 1: Indicative and subjunctive morphology in Russian

Infl heads	Morphological spell-out
1 T: [Fin], (E)	Past tense
2 T: [Fin]>[Coin], (E)	Present tense
3 Irr: [Irr], T: [Fin], (E)	<i>By</i> + Past tense
4 Irr: [Irr], (E)	<i>By</i> + Infinitive

Overall, *by* requires that the event not be bound by the utterance situation, therefore it cannot be anchored with respect to person or time. This conforms to Jespersen's (1924: 319), cited in Cowper (2002: 10) claim that the subjunctive expresses a perspective other than the speaker's. Moreover, the semantics expressed by *by*, such as obligation, desirability, advisability, hypothesis, are captured by this analysis in treating *by* as an unrealis particle.

5 *By* in complement clauses

Work on *by* typically makes note of the particle's tendency to move to second position in a clause when some sort of complementizer appears in C (Hacking 1998:

⁴Concerning line 3 in Table 3, one could think of *by* as requiring that the clause within which it appears is specified for [-Coin] (in both the Infl and C domains). The postulation of binary features in this analysis, however, would lead to overgeneration.

29). For instance, there is a strong tendency for *esli* ‘if’ and *by* to appear adjacent to one another in the antecedent of a conditional, as in (24). An antecedent with *esli* in which *by* appears farther from the complementizer, as in (25), is degraded for many speakers.

- (26) a. **Esli** by my zna-l-i ob étom, my by vam skaza-l-i.
 if BY we know-PST-PL about this we BY you tell-PST-PL
 b. ?**Esli** my zna-l-i by ob étom, my by vam skaza-l-i.
 if we know-PST-PL BY about this we BY you tell-PST-PL

'If we had known about this, we would have told you.' (Hacking 1998: 29)

Čto ‘that’ also bears a tight relation to *by*. It has been noted, however, that there are speakers for which (26) is interpreted as equivalent to (27). For those who do not get the same interpretation, (26) merely sounds like an incomplete embedded conditional (Brecht 1977: 40).

Given the high markedness for speakers, it might be that *esli* by and *čtoby* are separate lexical items from the independent *esli*, *čto*, and *by*. Brecht (1977) shows, though, that when the embedded clause is comprised of two (and presumably more) conjuncts, *čtoby* appears in the first clause and the second conjunct contains only an instance of *by*, as in (28) (see similar discussion on *esli* by in Hacking 1998: 29-32).

- (28) Ty vele-l, čtoby ja uexa-l v Minsk odin, a Vasja by ostalsja s tobom?
 you order-PST ČTOBY I leave-PST at Minsk alone and Vasja BY remain with you
 'Did you order that I leave for Minsk alone and Vasja remain with you?'
 (Brecht 1977: 36)

Furthermore, **BarnetovaEtAl1979**, cited in **Hacking (1998)**, suggest that an element that appears between *esli* and *by* receives a focused reading. In fact, according to a consultant of my own, the following receives a reading according to which *Nikol'* has contrastive focus.

- (29) Esli Nikol' by mne skaza-l-a ja by vstreti-l ee v škole.
if Nicole BY me.DAT tell-PST-SG.F I.NOM BY meet-PST her.ACC at school
'If Nicole had told me, I would have met her at school.'

Suppose *čto* and *esli* and other related complementizers appear in Force, assuming Rizzi's (1997) split CP analysis. The structure of the C domain is shown in (30), where “>” simply expresses dominance. Suppose that this full-fledged structure may also be projected in Russian.

- (30) ForceP > TopP > FocP > TopP > FinP (Rizzi 1997: 297)

As previously mentioned, Force encodes information about clause type and FinP works in tandem with ForceP to select either finite or non-finite IPs (Rizzi 1997). I have argued in Melara (2014) that complement clauses selected by propositional attitude verbs lack a feature that links a clause to the perspective of the speaker, accounting for cross-linguistic differences in what has traditionally been referred to as sequence of tense phenomena. For example, in English, a past tense in a complement clause embedded under a matrix past tense will be interpreted either at or before the time of the matrix clause event (thus, exhibiting sequence of tense). This is shown in (31). In Russian, the embedded clause in the same tense configuration can instead only be interpreted as prior to the time of the matrix event, not coinciding with it (i.e. it does not exhibit sequence of tense with complement clauses). This is shown in (32). Crucially for both languages, the forward-shifted reading in complement clauses is impossible.

- (31) John said that Mary was pregnant.
- Embedded situation coincides with matrix situation*
John said: "Mary is pregnant." available
 - Embedded situation precedes matrix situation*
John said: "Mary was pregnant." available
- (32) Maša skazala, [čto Petja byl bolen].
Masha said.PRF.PST that Petya was sick
'Masha said that Petya was sick (i.e., Petya had been sick).'
- Embedded situation does not coincide with matrix situation*
Masha said: "Petya is sick." unavailable
 - Embedded situation precedes matrix situation*
Masha said: "Petya was sick." available
(Kondrashova 1999: 183, as cited in Mezhevich 2006: 174)

In line with what I am arguing for here, I proposed that indicative clauses must be both personally and temporally anchored. In matrix clauses, this is accomplished by a temporal deixis feature in Infl, a personal deixis feature in C/Force, both, or by default when there is no feature specified to express otherwise. In the absence of these anchoring features in T or C, perhaps because a language lacks them altogether, the clause is anchored by default to the utterance time and speaker in matrix clauses. Embedded clauses lacking these features are temporally and personally anchored to the time and viewpoint of the (Agent/Experiencer) subject of the embedding clause. Accordingly, in both of the English and Russian sentences above, the embedded clause lacks the personal anchoring feature in Force and the embedded clauses are interpreted relative to the perspective of the matrix subject. What makes the temporal interpretations different between the two languages, though, is that English has an anchoring feature in Infl (Cowper's 2005 [T-deixis]), while Russian does not, hence the English complement clause is thus temporally independent while the Russian one depends on the temporal interpretation of the higher clause.

I claim that in Russian, the same personal anchoring feature is in complementary distribution with *čto* 'that'. Let's also call this feature [Coin], manifested in the propositional domain, where anchoring to the utterance context via point-of-view is established. As I have claimed, *by* cannot be bound by the utterance context, due to the irrealis semantics of [Irr]. If Fin is the head that establishes a transition from situation to proposition (RamchandSvenonius2014), then it is possible that [Irr] moves into Fin when the CP domain is projected in order to scope upward within the C domain to ensure that it is not being bound to the utterance context, in violation of [Irr]. This correctly predicts that it is possible, though marked for many speakers, to have a focused element between the complementizer and *by*. Furthermore, it captures *by*'s preference for the second position in the clause when the C domain is overtly projected.

If indeed [Coin] in Force creates a barrier for inter-clausal operations like temporal anchoring, then we can explain why subjunctive complement clauses embedded under a non-past matrix clause cannot receive a past tense interpretation. (33), repeated from (15), shows that a past tense subjunctive clause under a non-past matrix verb can receive a present or future reading but not a past one.

- (33) a. Ja xoču, čtoby Maša **zavtra** s"e-l-a jabloko.
 I want ČTOBY Mary tomorrow eat-PST-SG.F apple
 'I want for Mary to eat an apple tomorrow.'

- b. Ja xoču, čtoby Maša **sejčas** e-l-a jabloko.
I want ČTOBY Mary now ate-PST-SG.F apple
'I want for Mary to be eating an apple right now.'
- c. *Ja xoču, čtoby Maša **včera** s"e-l-a jabloko.
I want ČTOBY Mary yesterday eat-PST-SG.F apple
Intended: 'I want for Mary to have been eating an apple yesterday.'
(Asarina 2006: 8)

The presence of *čto* in Force tells us that Force is not specified for [Coin]. This means the lower clause is temporally anchored to the time of the matrix situation. Given that in a matrix non-past context, the higher clause is specified for the temporal [Coin], the lower clause may only be compatible with readings that arise from the specification of temporal [Coin]. In order to get a past interpretation of the subjunctive complement clause, the matrix verb must appear in its past tense form, as in (34).

- (34) Ja xote-l, čtoby Maša včera s"e-l-a jabloko.
I want-PST ČTOBY Mary yesterday ate-PST-SG.F apple
'I wanted for Mary to have eaten the apple yesterday.'

I claim that Russian present and future tense forms both spellout [Coin], hence their similar morphological forms. Their interpretation as present or future arises from their aspectual properties. The future reading in (33a) is therefore licit, since nothing featurally blocks the reading.

Finally and speculatively, it is possible that *čto* and *by* are over time lexicalizing as a single item, with *esli* + *by* lagging slightly in the same process. I leave this question for future research.

6 Conclusion

This paper has investigated the morphosyntactic properties of what the literature refers to as the Russian subjunctive. The particle *by*, which is used to form this type of construction in Russian, has been argued to be the spellout of an irrealis head Irr. This functional head was proposed to be the highest head of the Russian Infl system, taking a TP, EP, or vP as its complement. I have claimed that Irr encodes irrealis semantics. That is, the projection of this head – the specification of the feature [Irr] – establishes that the proposition denoted by the clause is not bound to the utterance context. Its projection is therefore incompatible with the

feature [Coin] in either the Infl or C domains as [Coin]’s specification binds a clause to the utterance context temporally or personally, depending on where it is specified. This captures the lack of temporal dependency matrix subjunctive clauses exhibit and the lack of commitment on the speaker’s part towards the proposition expressed by the subjunctive clause. Moreover, the fact that *by* cannot appear with non-past morphology stems from the proposal that non-past-tense morphology is the spellout of [Coin]. In essence, then, the subjunctive-indicative mood (or better yet, the irrealis–realis) distinction in Russian is one that lies in the projection or non-projection of [Irr].

The analysis presented in this paper ultimately results in the proposal that the non-past tense is marked relative to the past in Russian. Additionally, *by* spelling out a head whose semantics are inherently irrealis, the analysis presented also captures the modal-like interpretations of the Russian clauses that contain *by*, which namely express obligation, desire, advisability, hypothesis, and so forth on the part of the subject. Also shown was the fact that *by* cannot appear in clause-initial position. This restriction was argued to be due to the fact that *by* moves to the head of FinP in the C domain, which itself is selected by one of the higher heads of an expanded CP layer.

As noted by a reviewer, clearly the analysis presented here runs *contra* the literature on the subjunctive. The subjunctive has typically been considered syntactically/semantically impoverished relative to the indicative mood. Under the analysis presented in this paper, the structure of the Russian subjunctive is structurally more marked compared to the indicative. Ultimately, this analysis supports Wiltschko’s conclusion that while categories like indicative and subjunctive may be universal, the way in which they are constructed is language specific. While further work on the morphological closeness of *čto* and *by* ought to be conducted, the analysis presented in this paper has nonetheless proposed a framework of the language’s Infl properties from which further work can springboard.

Abbreviations

1	first person	NEG	negative
2	second person	NEUT	neuter
3	third person	NOM	nominative
ACC	accusative	PL	plural
DAT	dative	PFV	perfective
F	feminine	PROG	progressive
FUT	future	PRS	present
GEN	genitive	PST	past
IPFV	imperfective	SBJ	subjunctive
IND	indicative	SG	singular
INF	infinitive	TOP	topic

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Chapter 11

Head directionality in Old Slavic

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This paper investigates the issue of head directionality in Old Slavic. This issue has played an important role in diachronic studies on Germanic, in which a switch in head directionality was assumed to have triggered word order changes in the history of these languages. Within Slavic, Old Bulgarian and Old Church Slavonic have been claimed to partly feature head-final grammars by [pancheva2005](#); [pancheva2008](#) and [dimitrovavulchanova-vulchanov2008](#), in contrast to contemporary Slavic languages, which are head-initial. This paper shows that there is little evidence for head-finality in Old Slavic.

Keywords: directionality parameter, clitics, participle movement, Old Chuch Slavonic, Old Bulgarian

1 Head directionality

The hypothesis of head directionality has its roots in [greenberg1963](#)'s ([greenberg1963](#)) empirical generalizations concerning the position of the verb with respect to the direct object in the verb phrase and the correlation between object placement and the ordering of other elements. [greenberg1963](#) observed that the order within VP has typological implications: VO languages have prepositions, whereas OV languages have postpositions. Within the framework of Principles and Parameters, this correlation is straightforwardly captured through the postulate of the head parameter, which implies that languages show variation concerning the order of the head with respect to its complement (see [Vennemann 1972](#) and [Dryer 1992; 2007](#) for discussion). On the assumption that in spite of crosslinguistic variation the head–complement order within a single language is invariant, in head-initial languages the complement always follows the head, hence the object follows the verb and the preposition precedes its nominal complements. Correspondingly,

in head-final languages the object precedes the verbal head, the way a nominal complement precedes its postposition.

It has been observed, however, that not all languages display a consistent setting of the head parameter (see Hawkins 1980; 1982). For instance, a well-known case of inconsistency is that of German. Although German is predominantly head-initial, the verb is final in non-finite verb phrases, while adjective phrases may be both head-final and head-initial. In diachronic studies, it has been postulated that the setting of the head parameter may switch in language history. For instance, *pintzuk1991* shows that although Old English (OE) featured mainly OV (head-final) structures, there were also minor instances of VO orders, as evidenced by exceptional structures involving particles, see (1a), and personal pronouns following the verb, see (1b).

- (1) a. þa wolde seo Sexburh æfter syxtyne gearum don hire swustor
then wanted the Sexburh after sixteen years take her sister's
ban of ðære byrgene up
bones from the burial.place up
'After sixteen years Sexburh wanted to take up her sister's bones
from their burial-place'
- b. We wyllað secgan eow sum bigspell
We want tell you a parable
'We want to tell you a parable' (OE, *fischer-et-al2004*)

On *pintzuk1991*'s analysis, the post-verbal placement of particles and objects is indicative of the head-initial setting of VP, which in Old English constitutes a minority pattern. This pattern is assumed to be in competition with the more common head-final VP order instantiated by OV structures.

The hypothesis of grammar competition was postulated by *kroch1989* in order to capture a period of diachronic variation between two structures that are not compatible with each other within a single grammar. Such two structures are assumed to represent two contradictory parameter settings (such as head-final versus head-initial constructions), or, within the Minimalist framework, the presence of lexical items with contradictory features (see also *pintzuk2002*). The postulate of grammar competition has resulted in many fruitful analyses of diachronically unstable structures. For example, *haeberli-pintzuk2006* investigate the position of the main verb and the auxiliary with respect to adjuncts and complements in verb clusters in Old English and attribute the observed word order variation to a switch in head directionality of functional projections in Old English.

Within Slavic, a switch in head directionality is assumed to trigger a change in the cliticization in *pancheva2005*'s (*pancheva2005*) analysis. This paper argues for a different view, and it is organized as follows. §2 examines the arguments for head finality provided by *pancheva2005* on the basis of a diachronic modification of cliticization patterns in Bulgarian. §3 overviews *pancheva2008*'s (*pancheva2008*) argumentation related to participle–auxiliary orders and the position of negation in Old Church Slavonic.¹

2 *pancheva2005*'s (*pancheva2005*) analysis of head directionality in Old Slavic

Most analyses of Old Church Slavonic syntax (willis2000; jung2015; jung-migdalski2015; migdalski2016) assume that it was head-initial on a par with Modern Slavic languages. The exceptions are accounts due to dimitrovavulchanova-vulchanov2008, who postulate that it was X^0 -final in the VP-domain and X^0 -initial in the CP-domain, as well as *pancheva2005*; *pancheva2008*, who argues that it was T^0 -final on the basis of the position of pronominal clitics, negation, and participles with respect to the auxiliary. However, a challenge that these analyses face is the fact that a switch in head directionality should have triggered a major modification of the syntactic structure of these languages. Such a modification did not occur; moreover, in contrast to Germanic languages, all contemporary Slavic languages are strictly head-initial. In view of this, the subsequent section will show that there is little evidence for head-finality in Old Slavic. In §2.1 I provide an overview of *pancheva2005*'s analysis of diachronic Bulgarian data. In section §2.2 I present a criticism of her account.

2.1 *pancheva2005*'s (*pancheva2005*) study the diachrony of cliticization patterns in Bulgarian

pancheva2005 provides a detailed analysis of the diachrony of cliticization patterns in the history of Bulgarian. She establishes that in the earliest stages (9th–13th c.), Old Bulgarian displays largely the same distribution of clitics as Old Church Slavonic. Namely, the clitics occur after the verb, as shown in (2). As the verb does not need to be located clause-initially, they are clearly not second position clitics. Although contemporary Bulgarian also features verb-adjacent cliticization, it normally disallows post-verbal clitic placement.

¹This paper presents a further development of the analysis proposed in migdalski2016.

- (2) svētъ bô mõžъ stvorilъ ja jestъ
 holy because man create.PART.M.SG them.ACC is.AUX
 ‘Because a holy man has created them’ (9th c. Bg, **pancheva2005**)

pancheva2005 assumes, following **kayne1991**, **chomsky1995**, and corresponding analyses of verb-adjacent cliticization that underlyingly pronominal clitics are generated as VP arguments. They move from XP-positions in VP and left-join to T⁰ as heads. Crucially, the fact that the accusative pronominal clitic precedes the auxiliary verb in (2) leads her to assume that Old Bulgarian is a T⁰-final language, but all the other heads are initial.

- (3) [TP [vP [V t_i V⁰]] [T CL_i T⁰]]] (**pancheva2005**)

Another assumption made by **pancheva2005** is that although in Old Bulgarian lexical verbs leave vP, they do not reach T⁰ but only Asp⁰ located below T⁰. This means that her evidence for the final T⁰ comes from the position of the auxiliary ‘be’ (such as *estъ* in (2)) located in T⁰ with respect to pronominal clitics (such as *ja* in (2)).

The post-verbal cliticization was the dominant pattern in Bulgarian until the 13th century. Subsequently, Wackernagel (second position) cliticization prevailed and remained the default type until the 17th century. **pancheva2005** attributes this change to a switch in the head parameter of T⁰, which became head-initial. She claims that as a result of the switch pronominal clitics begin to appear in front of T⁰ and their position with respect to the verb becomes reversed, as shown in the derivation in (4a). Since other elements may now occur between the verb and the clitic, the verb is no longer analyzed as the clitic host by the speakers. The clitics remain phonologically enclitic and receive prosodic support from their new hosts located in SpecTP, see (4b) and (4c), or SpecCP.

- (4) a. [TP [TP (CL) [TP XP =CL T [AspP [Asp V Asp]]]]] (**pancheva2005**)
 b. tova se pomoli Juda bogu
 that.TOP REFL ask.PART.SG.M Judas God
 ‘Judas asked God that.TOP’ (18th c. Bg, **pancheva2005**)
 c. a tia gy zle mõčaše
 and she them.ACC badly tortured
 ‘She tortured them badly’ (17th c. Bg, **pancheva2005**)

pancheva2005 notes a syntactic restriction on the lexical elements preceding second position clitics during this period. She observes that in contrast to con-

temporary Slavic languages with Wackernagel clitics, the clitics in the Bulgarian corpus data from that period occur strictly after the first word, which in some cases results in Left Branch Extraction. There are no instances of clitics following the first branching phrase. The same observation is made by **radanovickocic1988** for the earliest stages of the development of Wackernagel cliticization in Old Serbian. Second position cliticization with clitics preceded by unambiguous phrasal elements became available in Serbian only at a later stage. I take this correlation to mean that the Old Bulgarian data analyzed by **pancheva2005** exemplify the initial stage of the emergence of second position cliticization, which was not completed. Incidentally, this syntactic restriction on second position cliticization cannot be captured by **pancheva2005**'s derivation presented in (4a), given that she assumes that the pre-clitic element is located in an XP-projection: SpecTP or SpecCP.²

The third stage of the diachronic change investigated by **pancheva2005** takes place from the 17th c. onwards, when second position clitics in Bulgarian are reanalyzed as preverbal clitics. This pattern prevails in the 19th century and continues to be the default cliticization type in contemporary Bulgarian. **pancheva2005** points out that this change was contemporaneous with the loss of obligatory topicalization to SpecTP. The topicalization affected a number of unrelated categories, including the demonstrative *tova* in (4b) and the subject *tia* in (4c). **pancheva2005** argues that the decline of topicalization had repercussions for the syntax of clitics: as SpecTP became filled less frequently, the clitics were no longer analyzed as hosted in second position by a constituent located in SpecCP or SpecTP. Instead, the clitics started to appear more frequently adjacent to the verb. In syntactic terms this meant, in **pancheva2005**'s view, that they were reinterpreted as items merged in X⁰ positions, adjoined to functional heads in the

²In some Slavic languages, such as Serbo-Croatian, the second position clitic *li*, which functions as a focus or interrogation marker, may also be preceded exclusively by single words, as illustrated in (i), following Bošković's (2001: 27) observation.

- (i) Skupe (ii) knjige (*li) Ana čita?
 expensive Q books Q Ana reads
 'Does Ana read expensive books?' (S-C, Bošković 2001: 27)

Bošković (2001: 31ff.) attributes the restriction to the syntactic deficiency of *li* in Serbo-Croatian, which is not able to support a specifier, and the focus feature of *li* may only be checked through head movement. In fact, this is a special property of “operator clitics” expressing the illocutionary force of a clause, which in many Slavic languages display special requirements concerning the categorial and syntactic status of their preceding element, in contrast to pronominal and auxiliary second position clitics. See migdalski2016 for discussion.

extended projections of the verb, see (5a), rather than as XP elements that move from argument positions within VP and head-join to T⁰.³ With the loss of second position interpretation, the clitics could be located lower in the structure, next to the verb, as shown in illustrated in (5b) for the reflexive clitic *sa*, which is left-adjacent to the verb *javi*.

- (5) a. [TP ...T⁰...[XP [X CL X⁰] ... [VP V⁰]]] (pancheva2005)
b. i archangel Michailъ pak sa javi Agari
and archangel Michael again REFL appeared Agara
'And Archangel Michael appeared to Agara again'
(18th c. Bg, pancheva2005)

2.2 Empirical problems with pancheva2005's (pancheva2005) analysis

pancheva2005's analysis addresses a remarkably large set of data, covering different cliticization patterns in the history of Bulgarian. Although her empirical observations are impressive, the analysis suffers from a number of serious shortcomings.

First, the postulated link between head directionality and a cliticization pattern does not receive any support from synchronic considerations. As is well-known, contemporary Slavic languages display two distinct patterns of cliticization (see, e.g., Franks-King2000). On the one hand, Czech, Serbo-Croatian, Slovak, and Slovenian feature second position clitics, which obligatorily occur after the clause-initial element virtually irrespective of its category. This type of clitic distribution is illustrated in (6) for a sequence of auxiliary and pronominal clitics in Serbo-Croatian. The clitics can be preceded by a number of different categories, including the subject, see (6a), a wh-element, see (6b), and an adverb, see (6c).

- (6) a. Mi smo mu je predstavili juče.
we are.AUX him.DAT her.ACC introduce.PART.PL yesterday
'We introduced her to him yesterday.'
b. Zašto smo mu je predstavili juče?
why are.AUX him.DAT herACC introduce.PART.PL yesterday
'Why did we introduce her to him yesterday?'

³An anonymous reviewer points out that Pancheva's account on the reanalysis of clitics fits into the economic factor assumed in grammaticalization, "Merge as a head, not a phrase." However, jung-migdalski2015 show that this factor is challenged by the degrammaticalizaiton of pronominal clitics into weak pronouns, which occurred in Old Russian and Old Polish.

- c. Juče smo mu je predstavili.
 yesterday are.AUX him.DAT her.ACC introduce.PART.PL
 'Yesterday we introduced her to him.' (S-C, Bošković 2001: 8–9)

On the other hand, two Slavic languages, Bulgarian and Macedonian, have verb-adjacent clitics, which may not be separated from the verb by any intervening material, see (7a). As shown in (7b), these clitics do not need to target second position.

- (7) a. Vera mi go (*včera) dade.
 Vera me.DAT it.ACC yesterday gave
 'Vera gave it to me yesterday'
 b. Včera Vera mi go dade. (Bg, franks2010)

The Slavic languages that display these two cliticization patterns differ in a number of ways. For instance, only the languages with verb-adjacent clitics have definite articles (see boskovic2016) and tense morphology (see migdalski2015; migdalski2016). Crucially, they are all head-initial irrespective of their cliticization system.

Diachronically, the verb-adjacent pattern of clitics predates second position cliticization. It has been observed by radanovickocic1988 and pancheva2005 that in Old Church Slavonic pronominal clitics were predominantly verb-adjacent, as shown for the dative clitic *mi* in (8a) and for the accusative clitic *tę* in (8b).

- (8) a. Oca moego vъ těxъ dostoitъ mi byti
 father.GEN my.GEN in these be.appropriate.INF me.DAT be.INF
 'I had to be in my Father's house?' (OCS, Luke 2:49, pancheva-et-al2007)
 b. Ašte desnaě twoě rôka sъblažněetъ tę
 if right your hand sin.PRES.1SG you.ACC
 'If your right hand causes you to sin' (OCS, Matthew 5:30, radanovickocic1988)

Although pronominal clitics could occur in second position in Old Church Slavonic, especially when the clause-initial element was a verb (and hence they were verb-adjacent), radanovickocic1988 points out that only three clitics appeared in second position without exception: the question/focus particle *li*, the complementizer clitic *bo* 'because,' and the focus particle *že*, see (9a)–(9c).

- (9) a. Približi bo sę crstvie nbskoe.
approach.AOR.3SG because REFL kingdom heaven
'For the kingdom of heaven is at hand.'
(OCS, *Matthew 3:2*, radanovickocic1988)
- b. Mati že jego živěaše blizъ vratъ.
mother FOC his live.IMP.3SG near gates
'And his mother lived near the gates.'
(OCS, radanovickocic1988)
- c. Ašte li oko twoě lōkavo bōdetъ
if Q eye your evil be.PRES.SG.N
'If your eye should be evil'
(OCS, *Matthew 6:23*, radanovickocic1988)

I observe in migdalski2016 that the second position clitics exemplified in (9a)–(9c) form a natural class of sentential (operator) clitics. The semantic property that unifies them is that they all encode the illocutionary force of a clause. The counterparts of these clitics in contemporary Slavic languages also target second position, regardless of whether their pronominal and auxiliary clitics also occupy Wackernagel position or whether they are verb-adjacent. Thus, as shown in (10), although Bulgarian has verb-adjeacent clitics, the clitic *li* is in second position, separated from the accusative clitic *ja* and the auxiliary clitic *je*.

- (10) Včera li Penka ja e dala knigata na Petko?
yesterday Q Penka her.REFL is.AUX give.PART.F.SG book.the to Petko
'Was it yesterday that Penka gave the book to Petko?'
(Bg, tomic1996)

The fact that pancheva2005 disregards the categorial status of clitics located in respective positions in her estimates of the different types of clitic placement is a major drawback of her analysis. In fact, this problem has been also pointed out by dimitrovavulchanova-vulchanov2008, who, referring to pancheva2005's (pancheva2005) analysis, note that in *Codex Suprasliensis* (a late Old Church Slavonic relic) the distribution of clitics is quite consistent and regular, and it does not seem to be a matter of statistical frequency or choice. dimitrovavulchanova-vulchanov2008 observe that in *Codex Suprasliensis* clitics are found in second position if SpecCP is filled, otherwise they are post-verbal. Although dimitrovavulchanova-vulchanov2008 do not provide any data in support of their observation, it is likely that that SpecCP is filled in the presence

of operator clitics of the type exemplified in (9), which are uniformly hosted in second position.

In migdalski2016 I further observe that *pancheva2005*'s analysis is challenged by synchronic and diachronic cliticization data from Slavic. On the synchronic side, a problematic empirical fact is that the clitic forms of the auxiliary verb 'to be' in South Slavic languages occupy a different position with respect to pronominal clitics depending on their person feature content. Namely, as indicated for Serbo-Croatian in (11), the 3rd person auxiliary clitic (such as *je* in (11a)) is located to the right of the pronominal clitics, while all the other auxiliary variants (such as the 1st person form *sam* in (11b)) are hosted to the left of the pronominal clitics.

- (11) a. On mu ih je dao.
he him.DAT them.ACC is.AUX give.PART.SG.M
'He gave them to him.'
- b. Ja sam mu ih dao.
I am.AUX him.DAT them.ACC give.PART.SG.M
'I gave them to him indeed.' (S-C, **tomic1996**)

If *pancheva2005*'s account of cliticization were to be adopted to account for the auxiliary clitic placement, it would imply that in contemporary South Slavic languages T⁰ is head-final in the structures with the 3rd person singular auxiliary, and that T⁰ is head-initial with all the other auxiliary forms. This is not a welcome result given that the auxiliaries assume a different position in the structure purely depending on their person/number feature specification. The nature of this morphological contrast suggests that it does not involve alleged competition between two grammars that differ with respect to T⁰-initial and T⁰-final placement but rather that the contrast is entirely synchronic.

On the diachronic side, *pancheva2005*'s proposal of the switch in the head directionality of T⁰, which relies on the position of pronominal clitics with respect to the auxiliary, is seriously challenged by the timing of the diachronic modification of the auxiliary placement in the history of Bulgarian. I report in migdalski2016, following slawski1946's (slawski1946) observations, that in Old Bulgarian all auxiliary forms followed pronominal clitics, as in the pattern in (2) above, which is used by *pancheva2005* as evidence for the T⁰-final order. Two additional Old Bulgarian examples in which a non-third person auxiliary follows the pronominal clitics are given in (12). At first sight they may seem to lend support to *pancheva2005*'s analysis, since in contrast to contemporary Slavic languages, all auxiliary forms are located to the right of the pronominal clitics.

However, in the 17th–18th century the auxiliary placement in Bulgarian underwent a modification: the first and second auxiliary forms shifted across the pronominal clitics, adopting the current distribution (slawski1946), as exemplified in (13). The timing of the modification is a problem for pancheva2005, as it took place when according to her analysis Bulgarian had featured T⁰-initial grammar for several centuries, with no second position clitics left.

- (13) a. deto si së javilb na mòata žena
 where are.AUX.2SG REFL appear.PART.SG.M to my.the.wife
 'Where you have appeared to my wife' (17th c. Bg, slawski1946)
 b. nó sa gi zváli gotiï
 and are.AUX.3PL them.ACC.PL call.PART.PL Goths
 'And they called them Goths' (18th c. Bg, slawski1946)

I observe that the timing of the switch of the auxiliary forms indicates that second position cliticization is not related to the alleged loss of T⁰-finality or the position of pronominal clitics with respect to the auxiliary. The lack of the correlation between these properties is also independently confirmed by jung2015's (jung2015) study of the auxiliary placement in Old Russian data. jung2015 points out that even though Old Russian had second position clitics until the 14th century, the first and second person forms of the auxiliary rigidly followed the pronominal clitics throughout this period. Furthermore, in migdalski2015; migdalski2016 I develop an analysis of a diachronic switch from verb-adjacent to Wackernagel clitics in Serbo-Croatian, Slovenian, and Polish, showing that it was contemporaneous with the loss of tense morphology, analyzed as the loss of TP. It remains to be determined whether a related analysis can be applied to the Old Bulgarian facts noted by pancheva2005.

3 pancheva2008's (pancheva2008) arguments for the final T^0 related to participle-auxiliary orders and the distribution of negation

This section examines the arguments for the T^0 -finality of Old Church Slavonic that pancheva2008 provides in her later work. They are related to the syntax of compound tenses formed with the *l*-participle and the auxiliary 'be' and the interaction between negation and verb placement.

3.1 Participle–auxiliary orders in Old Church Slavonic

Most South and West Slavic languages feature a compound tense construction formed with the auxiliary 'be' and the *l*-participle; see (14a) for Bulgarian. The *l*-participle may be fronted across the auxiliary, as in (14b).

- (14) a. Az sūm čel knigata.
I am.AUX read.PART.SG.M book.the
'I have read the book.'
- b. Čel sūm knigata.
read.PART.SG.M am.AUX book.the
'I have read the book.' (Bg)

This operation has received considerable attention in the literature since lema-rivero1989's (lema-rivero1989) analysis of the fronting in terms of Long Head Movement, which on their account proceeds via head raising of the *l*-participle from V^0 to C^0 across the auxiliary located in I^0 , as shown in (15).

- (15) [CP [C Part_{*i*}] [IP Aux [VP [V t_{*i*}] DP]]]

The operation has also been analyzed as head adjunction of the participle to C^0 (wilder-cavar1994), to Aux^0 (boskovic1997), or to a focus projection Delta 0 (lambova2003). I proposed in my previous work (broekhuis-migdalski2003; migdalski2006) that the movement involves predicate inversion, which proceeds via XP remnant movement of the *l*-participle to SpecTP. This proposal accounts for a number of properties of the movement that had been unexplained in the previous analysis, such as the dependency of the phrasal movement on the presence of the auxiliary 'be' and the subject gap requirement, a property that will be important for the analysis presented in the remainder of this article.

pancheva2008 addresses similar cases of clause-initial participle placement in Old Church Slavonic, as illustrated in (17b).

- (16) a. iže běaxō prišbli otъ vъsěkojē vъsi
who.FOC be.PAST.3PL come.PART.PL from every village
'who had come from every village' (OCS, *Luke* 5.17)
- b. učenici bo ego ošbli běaxō vъ gradbъ
disciples for his go.PART.PL be.PAST.3PL in town
'because his disciples had gone to the town'
(OCS, *John* 4.8, pancheva2008)

In principle, the Old Church Slavonic structure in (17b) most likely illustrates a counterpart of participle fronting attested in Modern Slavic, as has been argued for by willis2000. pancheva2008 postulates, however, that on the assumption that Old Church Slavonic was T⁰-final, the ordering presented in (17b) could be taken to be the basic one, whereas the auxiliary–participle pattern in (17a) could be derived via rightward participle movement. In order to determine which order is the derived one, she calculates the ratio of both patterns.

Importantly, pancheva2008 notes that the participle–auxiliary order may be more frequent than the auxiliary–participle when the auxiliary is a clitic that needs prosodic support to its left. In order to limit the impact of the prosodic requirements on word order, she chooses to restrict her analysis to the structures involving the past tense auxiliary, which has a strong, non-clitic form. Furthermore, she assumes that the pattern that is a result of an optional operation will be statistically less common than the one that instantiates the basic order.

The results of her quantitative study show that both orders occur in a balanced proportion in Old Church Slavonic, though the participle–auxiliary pattern is less common than the auxiliary–participle pattern: 41% versus 59%. By contrast, in Modern Bulgarian the auxiliary–participle order is considerably more frequent and constitutes 97% of the data investigated by pancheva2008, versus 3% of the participle–auxiliary orders. Pancheva states that on the assumption that Modern Bulgarian is T⁰-initial and that participle–auxiliary sequences are a result of participle movement to the left, the contrast in the ratio of the two constructions across the centuries indicates that Old Church Slavonic was a T⁰-final language.

The diachronic contrast in the ratio of participle–auxiliary orders is certainly interesting and requires an explanation, though it should be noted that even in Old Church Slavonic the participle–auxiliary pattern is less frequent. pancheva2008 makes use of additional argumentation to support her analy-

sis. Namely, she acknowledges the fact that the different ratios of the participle/auxiliary patterns across centuries may have been due to different discourse factors that are reflected through these two orders rather than due to the switch in the T⁰-head parameter setting. Thus, it may well be the case that a particular discourse context started or ceased to be expressed through participle movement at a certain point in the history of Bulgarian. Yet, she ultimately rejects this possibility, referring to an observation of different ratios between active and passive participles preceding the auxiliary. She shows that in *Codex Marianus*, an Old Church Slavonic relic, active participles are placed in front of the auxiliary in 16% of cases, while passive participles precede the auxiliary in as many as 67% of cases. In Modern Bulgarian the rate is not that high. *pancheva2008* argues that this contrast may point to a situation in which two grammars (T⁰-final and T⁰-initial) are in competition, and that the switch in the setting of the T⁰-head parameter was initiated among active participles, which as a result gave rise to a higher rate of the active participle–auxiliary orders.

I would like to propose an alternative explanation of the observed diachronic frequency contrast in the participle–auxiliary orders. As has been examined in detail by *lambova2003*, participle fronting in Modern Bulgarian triggers different discourse conditions depending on whether it occurs across the present perfect auxiliary clitic (see (18a) below as well as (14b) above) or the strong past perfect auxiliary, as in (18b). Given that the auxiliary in (18a) is prosodically deficient and needs to be supported to its left, the fronting of the participle (or of some other element) to the position in front of the clitic is obligatory. In contrast, movement of the participle across the non-clitic auxiliary, as in (18b), is optional. As was mentioned above, *pancheva2008* restricts her diachronic analysis to the orders involving participle fronting across the past tense auxiliary, which correspond to the one in (18b), and in this way she avoids a potential influence of the clitic prosodic requirement on word order possibilities.

- (17) a. Gledali sa filma.
watch.PART.PL are.AUX.3PL movie.the
'They have watched the movie.'
- a'. * Sa gledali filma.
are.AUX.3PL watch.PART.PL movie.the
Intended: 'They have watched the movie.'
- b. Gledali bjaxa filma.
watch.PART.PL were.AUX.3PL movie.the
'They had WATCHED the movie.'

- b'. Bjaxa gledali filma.
were.AUX.3PL watch.PART.PL movie.the
'They had watched the movie' (Bg, lambova2003)

lambova2003 points out that whereas the participle movement across the auxiliary clitic illustrated in (18a) is perceived as neutral, the fronting across the past tense auxiliary exemplified in (18b) necessarily produces detectable semantic effects and is perceived as "marked." This fact is reflected in the translation of (18b), with the main verb capitalized to show a focused interpretation. lambova2003 argues that participle fronting across the past tense auxiliary is felicitous when "the speaker is presenting the activity under discussion as an alternative." Thus, the sentence in (18b) can be produced in a situation in which "the discourse contains either explicit or implied reference to the movie being in possession, i.e. rented or owned." (lambova2003). In such a scenario, a potential paraphrase of this example is 'They have only seen the movie.' The main verb is pronounced with a high tone, as is typical of contrastively focused constituents in Bulgarian. These properties lead lambova2003 to suggest that when the participle raises across the past tense auxiliary, it lands in a higher projection than it does during the fronting across the auxiliary clitic. She terms this projection Delta Phrase and assumes it is a discourse-related projection located above CP, where focus is licensed.

In Modern Bulgarian participle fronting across the past tense auxiliary results in a special discourse effect, so it is not surprising that it is not often found in the corpus examined by pancheva2008. What needs to be determined is whether a related discourse effect was produced by the corresponding participle reordering in Old Church Slavonic. It is likely that it did not. In fact, in §2.1 above I refer to a discourse-related syntactic change reported in pancheva2005, which occurred in Bulgarian between the 17th and the 19th centuries, and which involved the decline of obligatory topicalization targeting SpecTP. This change was accompanied by a reinterpretation of Wackernagel pronominal clitics as preverbal elements. Examples of the obligatory topicalization are given in (4) above and (18)–(20) below, and they include clauses with a topicalized object, see (4b), an adverbial participle, see (18), a finite verb, see (19), and an adverb, see (20). Pancheva notes that in Modern Bulgarian the corresponding structures are not felicitous.⁴

⁴dimitrovavulchanova-vulchanov2008 observe a high frequency of structures of this type in Old Church Slavonic, which leads them to assume that VP is head-final in this language. However, they do not exclude the possibility of VP being head-initial, with the topicalization derived via movement.

- (18) i otvěštavъ starecъ reče emu: ... i vъ drugо̄ ned(ě)lę priiide
 and answering old.monk told him and in other Sunday came
 starecъ kъ bratu
 old.monk to young.monk
 'And in response, the old monk told him: ... And the next Sunday, the old
 monk came to the young one' (14th c. Bg)
- (19) se priōtъ b(og)ъ pokaanie tvoe
 thus accepts God repentance your
 'Thus God accepts your repentance' (14th c. Bg)
- (20) pakъ utide angelъ i vtoriju ratъ
 again went angel and second time
 'The angel went there again for the second time' (18th c. Bg)

Even though the topicalization data provided by *pancheva2005* does not include examples with clause-initial *l*-participles, it is quite likely that they were also subject to the rule of obligatory topicalization. *broekhuis-migdalski2003* and *migdalski2006* argue on the basis of Modern Bulgarian that fronted *l*-participles target SpecTP. If the same analysis can be applied to Old Church Slavonic (see *willis2000*) and Old Bulgarian, the historically high ratio of participle movement receives a straightforward explanation: it is a product of the obligatory topicalization to SpecTP.

Another factor that may have given rise to the higher frequency of participle-initial orders in Old Church Slavonic is the fact that the complex tense structures formed with the *l*-participle and the auxiliary 'be' were considerably less common in Old Church Slavonic than they are in the contemporary South Slavic languages. Thus, *dostal1954*'s (*dostal1954*) estimates indicate that the *l*-perfect tense was used sporadically in Old Church Slavonic, and usually in subordinate clauses. *dostal1954*'s corpus study lists 10 thousand usages of the aorist, 2300 of the imperfect tense, and approximately only 600 instances of the perfect tenses (that is, approximately 5% of all the tense forms). The scarcity of the usage of the *l*-perfect compound tense in Old Slavic has been attributed to a number of factors (see *migdalski2006*: 26–27 for discussion). For instance, *bartula1981* (*bartula1981*; see also *damborsky1967*) notes that there are few examples of present perfect structures in the earliest Old Church Slavonic relics. They become more frequent in later manuscripts, such as *Codex Suprasliensis* and *Savvina kniga* (both from the 11th century). Most likely, the structures formed with the *l*-participle may have

felt too novel and innovative for formal biblical texts. The fact that these structures were far less common in Old Slavic than in present-day Slavic languages may have repercussions for the different ratios in the participle–auxiliary patterns investigated by *pancheva2008*.

3.2 The position of negation in Old Church Slavonic

The final observation used by **pancheva2008** to support her T⁰-final analysis of Old Church Slavonic is related to the interaction between negation and verb placement. It has been observed in the literature (see e.g. **rivero1991**) that in Modern Slavic negation may attract and incorporate into verbs, as a result of which the two elements form a single prosodic word. The process of incorporation is evidenced by the placement of second position clitics in languages such as Serbo-Croatian, which follow the sequence of negation and the finite verb, as in (21).

- (21) Ne {^{*}ga} vidim {ga}
 NEG him.ACC see.PRES.1SG him.ACC
 'I don't see him' (S-C, rivero1991: 338)

As will be discussed in more detail below, contemporary Slavic languages differ with respect to whether negation attracts the (finite) auxiliary verb or the *l*-participle. [pancheva2008](#) shows that in Old Church Slavonic negation may attract finite verbs, see (23a), including the auxiliary, see (22b), and, in contrast to Modern Bulgarian, in some cases also the *l*-participle, see (22c).

- (22) a. ne ostavitъ li devęti desętъ i devęti vъ pustyni
 NEG leaves Q nine ten and nine in wilderness
 'Does he not leave the ninety-nine in the wilderness?'
 (OCS, *Luke* 15.4)

b. sego avraamъ něstъ sъtvorilъ
 this Abraham NEG.IS.AUX DO.PART.SG.M
 'Abraham did not do this'
 (OCS, *John* 8.40)

c. ne moglъ bi tvoriti ničesože
 NEG can.PART.SG.M be.COND.3SG do.INF nothing
 'He couldn't do anything'
 (OCS, *John* 9.33, *pancheva2008*)

`pancheva2008` assumes that in Old Church Slavonic NegP is located above TP. In view of this assumption, the fact that negation may attract the *l*-participle

and as a result produce the negation–participle–auxiliary pattern is taken by **pancheva2008** to indicate a potential T⁰-final structure. According to her analysis, a T⁰-final structure can also be postulated for negation–auxiliary–participle orders on the assumption that negation attracts the auxiliary across the participle. Importantly, **pancheva2008** claims that since Old Church Slavonic shows variation in the verbal structures involving negation, allowing both negation–participle and negation–auxiliary orders, it is likely that Old Church Slavonic features two grammars (T⁰-final and T⁰-initial), which are in competition.

I observe that **pancheva2008**'s (**pancheva2008**) hypothesis of the two competing grammars, posited on the basis of the distribution of negation, is challenged by diachronic and empirical facts.

Diachronically, the position of negation with respect to the verb exhibits categorial and semantic contrasts, which suggests that it is not related to grammar competition. Thus, **vecerka1989** (**vecerka1989**; quoted in **willis2000**) observes that the negation–auxiliary order is four times as frequent as the negation–participle order. Correspondingly, **willis2000** shows that the auxiliary–negation–participle pattern is not found in matrix clauses. This type of variation is unexpected if grammar competition is involved.⁵

Furthermore, in subordinate clauses the position of the conditional auxiliary *bi* is related to the semantics expressed by the complementizer, which in turn may have a repercussion for the position of negation with respect to the auxiliary and the *l*-participle. As observed by **willis2000**, in Old Church Slavonic complementizers may attract the conditional auxiliary. The attraction is obligatory in the case of complementizer *a*, which introduces conditional clauses, see (23), but not with the complementizer *da*, which introduces indicative clauses, see (24).

- (23) a. A by bylъ sъde
if COND.3SG be.PART.SG.M here
'If he had been here'
- b. A by sъde bylъ
if COND.3SG here be.PART.SG.M
'If he had been here'
- c. A by bylъ prorokъ
if COND.3SG be.PART.SG.M prophet
'If he had been the prophet' (OCS, **vaillant1977**: 219)

⁵An anonymous reviewer points out though that embedded contexts may pattern differently in processes of language change. They may be more conservative than non-embedded contexts in the case of diffusion of a change.

- (24) a. Drъžaaxõ i da ne bi отъšelъ отъ nixъ
 held.3PL him that NEG COND.3SG leave.PART.SG.M from them
 ‘And they held him, so that he would not leave them’
 (OCS, *Codex Marianus*, willis2000)
- b. Drъžaaxõ i da bi ne отъšlъ отъ nixъ
 held.3.PL him that COND.3SG NEG leave.PART.SG.M from them
 ‘And they held him, so that he would not leave them’
 (OCS, *Codex Zographensis*, willis2000)

It can be assumed then that in subordinate clauses headed by the complementizer *a*, there will be no instances of the negation–auxiliary pattern, and that only the negation–participle order will be observed. Such a contextual, semantic-dependent restriction would be surprising if the variation were due to grammar competition. Rather, it seems that at least in the environments presented in (23) and (24), the position of negation with respect to the verb is dictated by a syntactic mechanism, which in specific contexts becomes obligatory.⁶

Synchronously, Pancheva’s assumption of the potential relation between the position of negation and the directionality of T⁰ is challenged by properties of complex tense structures in contemporary Polish and Czech. Polish, which is clearly a T⁰-initial language, permits negation to either precede the auxiliary or the participle. The type of possible order depends on the type of the auxiliary involved. For example, negation attracts the future auxiliary (which morphologically is the perfective form of the verb ‘be’), as shown in (25), but it adjoins to the *l*-participle rather than the perfect auxiliary in structures characterizing past events, as indicated in (26).

- (25) a. Nie będziesz parkował tutaj samochodu.
 NEG be.PERF.1SG park.PART.SG.M here car
 ‘You won’t park your car here.’
- b. * Nie parkował będziesz tutaj samochodu. (Pl)

⁶An anonymous reviewer provides an additional empirical fact that challenges Pancheva’s assumption of a link between the position of negation, cliticization, and head directionality. Namely, Old North Russian displayed both the negation–participle order (though negation could directly precede the copular ‘be’) and second position clitic system until the 14th century. On Pancheva’s analysis the co-occurrence of these two properties would indicate that Old North Russian was simultaneously T⁰-initial and T⁰-final.

- (26) a. Nie parkowali-śmy tutaj samochodu.
 NEG park.PART.PL.M-AUX.1PL here car
 ‘We didn’t park the car here.’
 b. * Nie-śmy parkowali tutaj samochodu. (Pl)

A corresponding variation is observed in Czech, which is also a T⁰-initial language. Thus, negation is adjoined to the *l*-participle, and it may not be adjoined to the auxiliary ‘be’. However, negation adjoins to the verb ‘be’ when it is used as a copula. The distributional contrast is presented in (27) and (28).

- (27) a. Přišel jsi.
 come.PART.SG.M are.AUX.2SG
 ‘You have come.’
 b. Nepřišel jsi.
 NEG.come.PART.SG.M are.AUX.2SG
 ‘You haven’t come.’
 c. * Nejsi přišel.
 NEG.are.AUX.2SG come.PART.SG.M
 Intended: ‘You haven’t come.’ (Cz, toman1980)

- (28) a. Jsi hlupák / zdráv / na řadě.
 are.2SG idiot healthy on row
 ‘You are an idiot / healthy / It’s your turn.’
 b. Nejsi hlupák / zdráv / na řadě.
 NEG.are.2SG idiot healthy on row
 ‘You’re not an idiot / healthy / It’s not your turn.’
 c. * Jsi nehlupák / nezdráv / ne na řadě.
 are.2SG NEG.idiot NEG.healthy NEG on row
 Intended: ‘You’re not an idiot / healthy / It’s not your turn.’ (Cz, toman1980)

Since in Czech auxiliaries and copula verbs are morphologically identical (except for the fact that the auxiliary form is null and the copula form is overt in the 3rd person singular and plural), the position of negation is clearly related to the categorial distinction between these two variants of the verb ‘be’. Thus, in both Czech and Polish the position of negation and the verb is evidently contextually

dependent.⁷ It is not a result of statistical frequency and it is not contingent on the head directionality of TP.

4 Conclusion

To conclude, this paper examined arguments provided in the literature, mainly by *pancheva2005; pancheva2008*, in favor of head finality in Slavic on the basis of diachronic changes in the placement of clitics in the history of Bulgarian as well as the syntax of participles and the position of negation in Old Church Slavonic. It has showed that there is little evidence in support of head finality in Old Slavic, and that this claim is also challenged by empirical facts concerning the distribution of the auxiliary ‘be’ in the history of Bulgarian. Furthermore, the diagnostics used in favor of the head final analysis have been demonstrated to give wrong predictions when applied to the same patterns found in Modern Slavic.

Abbreviations

AOR	aorist	N	neuter
AUX	auxiliary	NEG	negation
Bg	Bulgarian	OE	Old English
CL	clitic	OCS	Old Church Slavonic
COND	conditional	PART	participle
Cz	Czech	PAST	past tense
DAT	dative	Pl	Polish
DUAL	dual number	PL	plural
F	feminine	PRES	present
FOC	focus particle	Q	question particle
GEN	genitive	REFL	reflexive
IMP	imperfect tense	S-C	Serbo-Croatian
INF	infinitive	SG	singular
M	masculine	TOP	topic

⁷According to an anonymous reviewer, another factor that favors a categorial distinction between the copula and the auxiliary is the different timing of their loss in East Slavic languages such as Russian.

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Chapter 12

Perception of Bosnian/Croatian/Serbian sibilants: Heritage U.S. vs. homeland speakers. A pilot study

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Many dialectal varieties of Bosnian/Croatian/Serbian (BCS) show some level of merger of standard BCS alveolo-palatal and hard post-alveolar affricate series. This paper reports the results of a pilot study of the perception of BCS sibilants by heritage speakers in the United States. Twenty speakers were given a forced identification task. Results indicate that second generation heritage speakers are worse in performance than first generation heritage speakers. Additionally, heritage Croatian and Bosnian speakers across generations perform worse than heritage Serbian speakers.

Keywords: heritage language, phonology, language change, merger, affricates, Bosnian/Serbian/Croatian

1 Introduction

In Bosnian/Croatian/Serbian (BCS), the standard varieties have a typologically relatively rare contrast between “hard” post-alveolar affricates (/tʂ, dʐ/, compare the transcription of Polish hard post-alveolars in *Ladefoged-Disner2012*, or Slavic transcription /tš, dž/) and alveolo-palatal affricates (IPA transcription /tç,

dz/).^{1,2} BCS has also hard-post-alveolar fricatives but no parallel alveolo-palatal fricatives. The inventory of sibilants in standard BCS is represented in Table 1.

Table 1: Sibilants of standard varieties of Bosnian/Croatian/Serbian (phonetic symbols with Latin orthography between slashes)

Manner	Dental	Post-alveolar	Alveolo-palatal
Fricatives	[s] [z] /s/ /z/	[š] [ž] /š/ /ž/	
Affricates	[tš] /č/	[tž] [dž] /č/ /dž/	[tč] [dž] /č/ /đ/

The contrast is cross-linguistically rare and, in fact, many dialectal varieties of BCS show different levels of merger of the two posterior places of articulation. The merging areas included Istria, northern Dalmatia, Dubrovnik, Boka Kotarska, the varieties spoken by the Muslims in Bosnia and Hercegovina, Catholics of eastern and northern Slavonia, areas of Banat and Timok-Lužnik, the dialect spoken in the capital of Croatia, Zagreb (Stankiewicz 1986:107, and references therein, Ivic 1958, Žygis 2003 after Ivic 1958). Included, because, given the changed geopolitical situation after the Yugoslav war, the expansion of Štokavian dialects at the cost of Čakavian, and the increased prestige of Kajkavian (spoken in the area of Zagreb), the situation described in before mentioned publications has evolved substantially. However, the authors of the current publication are not aware of any new comprehensive study of the current distribution of merging varieties. Other dialectal areas of BCS, such as Western Hercegovina, resist the merger entirely. Due to mobility of speakers between different dialectal areas, the current sociolinguistic situation is that of a daily interaction between speakers realizing the contrast in different ways and those not realizing the contrast. This is also the situation for the heritage language as spoken in the U.S., which we investigate in this study. The influence of English can potentially further facilitate the merger

¹The hard post-alveolars are notoriously ambiguous, not only because of the variation in their realization in BCS. If there is no merger, phonetically they are neither sensu stricto retroflexes (though compare phonological arguments in Hamann 2003, e.g. for Polish) nor typical palatoalveolars – although the sounds that have undergone merger are probably to be described as palatoalveolars. We identify the non-merged, hard post-alveolars as /tš, dž/, symbols used in Ladefoged-Disner 2012 to describe Polish hard post-alveolars, where the authors made a strong case for using a non-IPA symbol distinct from the available symbols.

²We will continue using the Slavic symbols for the post-alveolar series for typographic reasons.

because one posterior place of articulation in English (palatoalveolar /tʃ, dʒ/) corresponds to a two-way place of articulation contrast in BCS (alveolo-palatal /tč, dž/ and post-alveolar /tš, dž/). The current study contributes to our better understanding of the merger processes and language change in general but also informs us of the strategies that native speakers adopt, first, when in close contact with different dialects and, second, with a dominant foreign language with conflicting phonological patterns.

§2 situates our study in the broader context of heritage language research. In section §3, the homeland situation is sketched. §4 is devoted to the methodology of the research and §5 provides the results. §6 relates the results back to the hypotheses and discusses the overall significance of the study while the paper is concluded in §7.

2 Heritage language studies context

The variety of BCS our study focuses on is the language of the Bosnian, Croatian, and Serbian diaspora in the United States (in particular, Chicago and the surrounding areas, including Northern Indiana). Previous research on heritage languages suggests that the language of heritage communities differs in systematic ways from the language as spoken in the homeland communities. One factor here is the interaction between the L1 and L2 (in our case, the L2 is English) sound systems (Polinsky 2018 and references therein). Additionally, in heritage language communities, the close contact of different dialects must be considered. Due to several factors, such as heritage speakers' geographical separation from homeland speech, there is less pressure from the standard language(s). This allows natural language change to proceed unimpeded (or impeded to a much lesser degree) by prescriptive grammars, formal schooling and official media. Finally, it is often the case that heritage speakers do not reach the level of competence in their heritage language that would be comparable with competence of homeland speakers (Scontras-etal2015). The language of the homeland is often not sufficient to serve as a universal communication tool in a different social context of the new country. Compensation strategies are developed to accommodate the needs of speakers, for example, code-switching. We believe that the situation of increased variation facilitates and accelerates language change.

In heritage language studies, there is no consensus concerning the definition of a heritage language and heritage speaker. Polinsky (2018) and Kelleher (2010) provide overviews of several definitions of heritage speakers and heritage language. Scontras-etal2015 describe heritage speakers as “unbalanced bilinguals, simul-

taneous or sequential, who shifted early in childhood from one language (their heritage language) to their dominant language (the language of their speech community). The definition of a heritage language can include a language that is acquired naturally at home, yet may be treated as a minority language outside of the home (Polinsky 2018; see Kupisch-etal2014 for further discussion of the definition of a heritage speaker). On the other hand, the term “heritage speaker” may also be used exclusively to describe bilinguals who were raised in a monolingual home (e.g., Polinsky-Kagan2007).

The current study will operate with the definition of a homeland speaker as an individual who natively speaks language A and still resides in their homeland country in which language A is widely spoken. On the other hand, we define a heritage speaker as someone who has lived in a new country in which their native language A is not widely spoken for a substantial amount of time, with the focus of their life interest moved to the new country;³ if they do speak their heritage language, it is usually reduced to being spoken in the home or with other speakers in a close-knit community. Heritage speakers are usually immigrants or displaced persons who have moved to a new country and their heritage language skills often range widely, from fluent monolingualism or bilingualism to total language loss through attrition (Scontras-etal2015). This study includes speakers from each end of this spectrum as well as many who fall somewhere along the middle with respect to language attainment.

Another issue in heritage studies is the observed diachronic generation-to-generation change (Otheguy-etal2007). In our study, we have identified Generation 1 as speakers who acquired their heritage language in the homeland natively, and Generation 2 as speakers who have primarily learned their heritage language in the new country. We also included speakers who immigrated to the U.S. as very young children before the onset of formal education in the Generation 2 category.

Further, Polinsky (2018) maintains that cross-linguistically, “immigrant and heritage varieties, separated from the ongoing change in the homeland, tend to retain features that are (or are perceived as) conservative” (Polinsky 2018: 129). Whether or not the language changes within the same generation is also an area of interest. In our study we ask if the language change is a function of time the speaker has spent within the new country. For example, in a large-scale analysis conducted using U.S. Census data of Spanish speakers living in the United

³For the purpose of our study, we adopted an arbitrary 7-year residence condition in the U.S. for the speakers of Generation 1 to exclude those new immigrants who would not have substantial exposure to English and the heritage language in the new country community.

States, Veltman (2000) found that “longer residence in the United States is associated with greater language shift.” (Veltman 2000: 66) In the context of our study, we will readdress these questions, the cross-generation differences and linguistic conservatism, in the discussion section.

While addressing the issue of conflicting phonological systems, Polinsky (2018) assumes that heritage speakers generally use “the knowledge of contrasts from one language to the other only when such contrasts are useful,” and suppress such differences when unnecessary (Polinsky 2018: 115). Using the concept of a distinction being “useful”, we are forced to adopt a perspective of a uni-directional influence of the dominant language influencing the heritage language. In the context of the current study, this means that we would expect heritage BCS speakers with English exposure to suppress their categorical distinction of alveolo-palatal vs. post-alveolar sibilants because English lacks this place of articulation distinction and maintaining this contrast is not “useful” from the point of view of the acquisition of English. One needs to observe that – although “usefulness” is primarily described in relation to the dominant language of the new country, in our case the “usefulness” of the contrast in the heritage language itself can play a role, that is, in its functional load. The contrast between post-alveolars and alveolo-palatals has a low functional load in BCS.

3 Sibilants of homeland speakers

BCS is a language continuum (called “macrolanguage” in Ethnologue) spoken in Croatia, Bosnia and Herzegovina, Serbia, and Montenegro with an estimated 15,260,000 speakers worldwide with considerable diaspora populations in the United States, Canada, and Australia (Simons-Fennig 2017). Figure 1 shows the geographical area where the homeland BCS speakers are located in Eastern Europe.⁴

As shown in Table 1, standard varieties of BCS contrast two posterior places of articulation for affricates. Conservative alveolo-palatals of BCS are articulated with an extreme raising of the tongue in the prepalatal area, while post-alveolars have the point of maximum constriction in the area of the alveolar ridge and just behind it, with the tongue body displaying no raising behind the constriction, see Figure 2. This is different from English where the palatoalveolars are articulated with a raised convex tongue but the raising is considerably less pronounced than in BCS alveolo-palatal sounds.

⁴Figure 1 is based on https://upload.wikimedia.org/wikipedia/commons/3/31/Balkan_Peninsula.svg by <https://commons.wikimedia.org/wiki/User:SilentResident> CC-BY-SA.



Figure 1: Southeastern Europe: Areas where homeland Bosnian/Croatian/Serbian is spoken

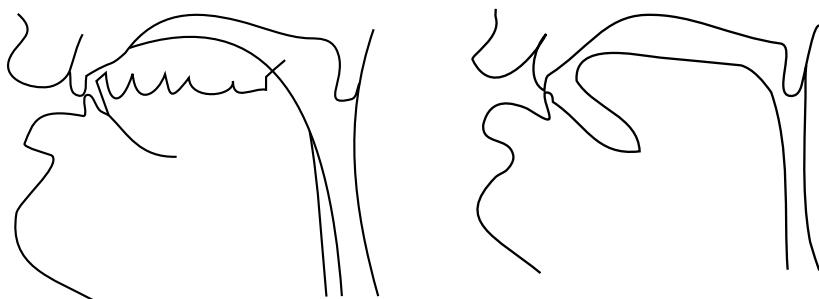


Figure 2: Alveolo-palatals (left) and post-alveolars (right) in a non-merging variety (here: Serbian; adapted from Miletić 1958)

Škarić (2009), when describing standard Croatian, distinguishes between three pronunciation types. First, the classical, virtually non-existent pronunciation type preserves a clear contrast. Second, the received pronunciation, characterizes careful speech of educated speakers with remnants of the contrast, in particular, COG values partly overlapping for the two places of articulation.⁵ Finally, the generally accepted pronunciation is that the places of articulation are completely merged. One has to bear in mind that the measures presented in Škarić (2009)

⁵COG (Center of Gravity) is in acoustics a measure for how high the frequencies in a spectrum are on average (at a particular point of time). COG provides a convenient dimension of comparison for sounds with a noise component. For example, denti-alveolar fricatives have their COG in higher frequencies and posterior fricatives.

represent the speech of speakers recorded in Zagreb, thus in the merging dialectal area. The rendition of the standard may be heavily influenced by the local dialect and, thus, the picture might differ if the measurements were to include speakers in other Croatian major cities. Whatever the details are, the point we want to stress is that some varieties of the homeland speech have merger or merger in progress, and that there is a lot of variation in the realization of the two posterior places of articulation for speakers of BCS in Europe.

In our understanding of the “homeland” perception of the contrast between the two posterior places of articulation, we rely heavily on an earlier study by Cavar-Hamann2011, who tested speakers from Croatia and Bosnia and Herzegovina (to the exclusion of speakers from Serbia). The study was, however, guided by different research questions from those that we investigate today and used a different software and tokens recorded by a different speaker. In particular, Cavar-Hamann2011 was a study of inter-language perception and used tokens produced by a Polish native-speaker. On the other hand, Polish alveolo-palatal affricates are very similar, if not identical, to the Croatian ones as articulated in non-merging dialects of Herzegovina. The tokens have also included alveolo-palatal fricatives, which are absent from Croatian, to test if Croatian speakers can use their ability to discriminate between alveolo-palatal affricates and hard post-alveolar affricates to perceive the contrast between Polish alveolo-palatal fricatives and post-alveolar fricatives. Unlike for the German control group, Croatian participants perceived all contrasts – including those absent from BCS – at the level comparable with Polish participants; see Figure 3. Four subjects out of twenty reached 100% accuracy in perception. The project also contained a produc-

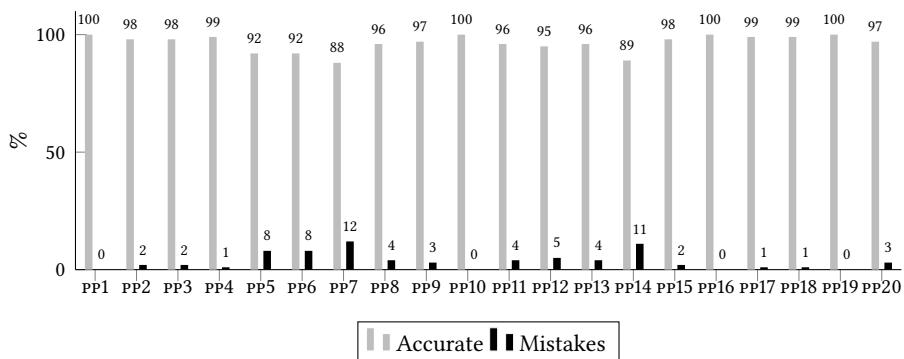


Figure 3: Perception of alveolo-palatals versus hard post-alveolars in a forced-choice identification task (Cavar-Hamann2008)

tion component.⁶ The same Croatian participants were recorded reading word lists containing Croatian sibilants. The highest ratio of mistakes in perception (up to 12%) was observed in subjects who do not produce a stable contrast between soft and hard affricate series in Croatian. Both subjects with the relatively highest error level come from the same area (of Zadar). Interestingly, the relation is not reciprocal: not all participants who do not produce consistent contrast have a higher ratio of mistakes in perception.

The rendition of the posterior place contrast showed a lot of inter- and intra-speaker variation. One speaker was switching between a more standard pronunciation and the dialectal pronunciation from Pag, where standard alveolo-palatals are realized as palatal stops. Out of twenty participants, ten articulated a stable contrast, for five participants the contrast was not realized in a reliable fashion, and five others did not have the contrast. Table 2 shows the geographical origins of speakers.⁷

Table 2: Homeland Croatian speakers by dialectal area

Štokavian (coast)	Štokavian (Slavonia)	Čakavian	Kajkavian
14	2	2	2

For those speakers whose pronunciation was not standard-like with two completely distinct categories, impressionistically five participants produced “hard” post-alveolars as more soft, four had alveolo-palatals shifted towards the “harder” series, three had variation in the production depending on whether the following vowel was front or back (only contexts of [e] and [a] were recorded). While only impressionistic descriptions are available at this point for all the original participants of the production study, it is clear that in homeland Croatian the perception of the contrast is surprisingly good given the high ratio of speakers with either complete merger or inconsistent rendering.

The contrast between alveolo-palatal and another post-alveolar place of articulation is relatively rare cross-linguistically (Maddieson 1984). The two sound series contrast, for example, in Chinese languages, in Polish, Serbo-Croatian and Lower Sorbian, in Ubykh and Abkhaz (cf. Ladefoged-Maddieson 1996). Some languages exhibit the contrast limited to individual manner of articulation and

⁶This was a study conducted by Cavar-Hamann 2008.

⁷Another useful consideration is how many of the speakers of either generation were speakers of a border variety of BCS – that is, a variety spoken near a political border. We did not collect this type of information and therefore cannot comment on this.

phonation type and/or enhance it with additional secondary articulations. From the functional point of view, it might be beneficial to merge the two series. Alveolo-palatals involve higher level of raising from the neutral position than palato-alveolars (e.g. in English), in contrast, “hard” post-alveolars require a much flatter tongue position than for the palato-alveolars, thus, a high degree of articulatory precision is necessary to maintain the contrast. Further, the two series are relatively similar auditorily. For example, in the interlanguage forced-choice identification task by Cavar-Hamann2011, untrained German native speakers achieved only 55% accuracy.

Additionally, in BCS languages the contrast has a relatively low functional load. To our knowledge, there are no studies focusing on the functional load of the contrast, but homeland(s) grammars (such as e.g. Brozović 1991) cite usually only a couple of relevant minimal pairs.⁸ The frequency of letters in Croatian generated by a character counter lists the letters *d̄*, *ć*, *č*, (*d*)*ž* among the least frequent in Croatian – not counting the foreign letters *y*, *w*, *x*, and *f* – with the following percentages in Croatian: *d̄* at 0.20%, *ć* at 0.49%, *č* at 0.92%, *ž* at 0.47%, all this bearing in mind that *ć* occurs in some frequent function words like *hoću* ‘will.1sg’.⁹ While the frequency of the letters in a written corpus cannot be interpreted directly to evaluate the frequency of sounds (for example, because *ž* is used in the representation of both the fricative ([ž]) and affricate ([dž]), it indicates that the sounds represented by the letters are at the bottom rank with regards to their functional load. No striking differences are expected between Croatian and other standard varieties. It is our understanding that low functional load might potentially facilitate the merger (cf. Wedel-etal2013).

4 Methodology

The study was guided by a number of research questions. First, we are interested, given the intra-language structural pressure and the influence from the contact language, whether or not Generation 2 merges more than Generation 1.

H1: Second-generation speakers merge more than first-generation speakers.

⁸E.g. *spavaćica* ‘pajamas’ vs. *spavačica* ‘woman, sleeping’. Other minimal pairs include *posećen* ‘visited’ vs. *posećen* ‘cut’, *veće* ‘bigger’ vs. *veče* ‘evening’ (Serbian), *kuće* ‘houses’ vs. *kuče* ‘puppy’ (Bosnian), and *čar* ‘benefit’, ‘gain’ (Bosnian) vs. *čar* ‘charm’; data retrieved from <https://forum.unilang.org/viewtopic.php?t=3028>.

⁹We used the following character counter: <https://www.sttmedia.com/characterfrequency-croatian>.

Further, we are also interested in the influence of the dominant English on the speech of Generation 1 heritage speakers, in particular we have assumed that for Generation 1 there will be a correlation between the length of the stay in the U.S. and the amount of merger:

H2: First-generation speakers are more likely to perceptually merge the two categories the longer they have spent in the United States.

Finally, we want to verify earlier findings from a pilot study of Cavar-etal2016 that hard post-alveolars tend to be realized as (more) soft while alveolo-palatals are relatively stable in the merger; see (1a). The other possible scenario in this merger process would be that both categories move towards the halfway point between alveolo-palatals and original post-alveolars (e.g. in terms of COG) to produce a palato-alveolar sound, as in (1b).

(1) **Merger scenarios**

- a. alveolo-palatals → alveolo-palatal
hard post-alveolars → alveolo-palatal
- b. alveolo-palatals → palatoalveolars
Hard post-alveolars → palatoalveolars

H3: In the merging contrast, alveolo-palatals are more salient perceptually and are perceived with greater accuracy than post-alveolars.

The study included a production part (a reading task) and a perceptual experiment. This paper reports the preliminary results of the perceptual study.

In the perception study, participants were asked to listen to syllables containing one sibilant in various vowel contexts, either VC, CV, or VCV. Participants were asked to listen to syllables containing one of six sibilant sounds and then forced to identify which sound of a pair they perceived it to be. By utilizing a forced representation task in the experiment, participants were required to make a decision on their perception of the sound regardless of how confident they feel on their decision. During the experiment, the reaction time was also recorded, but so-far not analyzed.

The tokens were recorded by a female native speaker from Hercegovina who produces a stable contrast between alveolo-palatal and post-alveolar places of articulation in her speech. The native speaker read a list of nonce words composed of a sibilant sound surrounded by the same vowel on either side (e.g. /eče/, /eče/, /eše/, etc.). The data were obtained through a forced-choice identification task made with Paradigm (experiment adapted from Lee-Jongman2016) and ran on a

Lenovo laptop with headphones on. Table 3 details the methods used to derive the 36 stimuli for the experiment; 6 stimuli came from each of the 6 sounds in the first column. Each stimulus was repeated once for a total of 72 tokens.¹⁰ The final column gives the spliced stimuli which were used in the perception experiment.

Table 3: Stimuli used in the perception experiment

Sound	Token environment	Tokens	Stimulus environment	Spliced stimuli
ć	#_VC	ćes ćas	#_V	će ća
	CV_#	seć	V_#	eć
		sać		ać
	CV_V#	seće	V_V	eće
		saća		aća
č	CV, VC, VCV	identical as ć	identical as ć	če, ča, eč, ač, eče, ača
đ	CV, VC, VCV	identical as ć	identical as ć	đe, đa, edđ, adđ, eđe, ađa
dž	CV, VC, VCV	identical as ć	identical as ć	dže, dža, edž, adž, edže, adža
c	C			c
š	#_VC	šes šas	V_#	še, ša
	CV_V#	seše	V_V	eše

Tokens were presented using headphones connected to a computer. Participants were tasked with indicating what they hear by clicking either the left arrow for /ć/, /đ/ or /c/, or the right arrow for /č/, /dž/ or /š/, as shown in Figure 4.

¹⁰/c/ and /š/ were included in the perception experiment to act as a control set to contrast with the merging series. As such, the stimuli used for /c/ came from a different native speakers' recording and the sound was extracted independently with no surrounding vowel information. The stimuli for /š/ came from the original native speaker, but less environments were included. As expected, the perception of both sounds was perfect for all speakers across all dialects and all generations (see Table 6) because neither /c/ nor /š/ are merging in any variety of BCS we are aware of.



Figure 4: Perception experiment design

The symbols correspond to standard orthographic form in the Latinica (Latin-based) alphabet. While the post-alveolar sounds in the merging series (/č, dž/) were grouped together and the alveolo-palatal sounds (/ć, đ/) were grouped together, there was no other correspondence between the direction of the arrow and any phonetic characteristic of the sound, especially in the arbitrary case of /c/ and /š/. Participants were asked to complete a brief demographic questionnaire in which they provided information, for example, on the language background of their parents. The language background survey asked participants to disclose their

1. sex,
2. age,
3. first languages (“ones you’ve spoken since you can remember”),
4. birth city, state, and country,
5. childhood home (“Where did you spend your childhood, if different than the above?”),
6. year of arrival to United States (“If you moved to the U.S., when did you come and to what city and state?”),
7. parents’ home (“Where did your parents/guardians spend their childhood (city, state, and country)?”>,

8. other homes (“other cities which you have visited/lived for more than three consecutive months”), including location (city, state, country), duration, and age.

Then for each language/dialect known (including native), participants were asked to provide

9. age of acquisition,
10. years of experience with this language, and
11. usage questions such as: “What percent of the time do you use this language?”, “Who do you typically speak this language with? (please list your relationship with people, but no names)”, “Where are these people usually from?”, “In what environment(s) do you usually use this language? (Or when do you usually get a chance to speak this language?)”, “How important do you think it is for you to speak this language?”, “Please indicate your abilities in each of the four areas in this language.” Areas: Speaking, Listening, Reading, Writing; Abilities: Poor, Fair, Good, or (Near)-Native?

A complete copy of the questionnaire is available upon request from the first author.

We defined first generation (Gen1) speakers ($N = 11$) as those who moved to the United States at seven years of age or older because children start their formal education in the homeland at the age of 7 and from that time on they become increasingly exposed to normative language education. Generation 2, in contrast, includes speakers who emigrated as very young children (before formal schooling began), as well as those who learned their heritage language in the current country of residence from their Generation 1 parents. In our study, we have investigated only Generation 1 and Generation 2 speakers.

20 speakers participated in the study, most of them ($N = 18$) women. The age of participants ranged from 20 to 78 and was correlated with their generation (Generation 1 versus Generation 2), where Generation 1 was older and Generation 2 was younger. Generation 1 was comprised of 11 participants while Generation 2 was comprised of 9 participants. We divided the participant group into Bosnians, Croatians, and Serbians, based on the place of birth, or the place of birth of the parents (for Generation 2). Half of all participants ($N = 10$) were included in the Serbian group, six in the Bosnian and Herzegovinian group, and four in the Croatian group. Table 4 provides a summary of speaker breakdown.¹¹

¹¹Gen 1 age mean: 45.73 (SD 18.91); Gen 2 age mean: 25.00 (SD 11.36).

Table 4: Participants overview; B = Bosnian, C = Croatian, S = Serbian

	Generation 1	Generation 2
female/male count	F = 10, M = 1	F = 8, M = 1
age range	20–57	20–78
dialect breakdown	2 B, 3 C, 6 S	4 B, 1 C, 4 S

5 Results

The following sections present the findings. §5.1 presents the basic descriptive statistics, §5.2 compares the results for Generation 1 and Generation 2 speakers. In §5.3, the results of the current study are compared with the available results of homeland speakers in Cavar-Hamann2011. §5.3 addresses the length of stay in the U.S. as a potential factor influencing the merger in the first generation of immigrants and §5.4 looks at the potential differences in the perception of different categories.

5.1 General results

Let us start with the ratios of incorrect responses for the three sub-groups of participants depending on the area of origin across the two generations. The data is further divided with respect to the type of sound – non-merging hard post-alveolars (/š/), merging hard post-alveolars (/tš, dž/), and merging alveolo-palatals (/č, đ/).

Due to the complex geolinguistic situation in the countries of former Yugoslavia, it was sometimes impossible to unambiguously identify the exact dialect spoken by participants in Generation 1, instead we use the area of origin as the variable. Generalized Linear Mixed Model (GLMM) analysis was conducted and the area of origin did not turn out to be a significant predictor in our data with $p = 0.24$ (model also includes generation, sound type, sound environment, age, and number of years since the acquisition of English). Croatian-origin participants' responses are marginally different from the Serbian group ($p = 0.099$). However, when looking at raw percentages, certain tendencies in the data can be observed. In particular, in the first generation Croatian-origin participants merge more than other groups. This difference is levelled in second generation.

Table 5: Percent of incorrect answers by area of origin, generation and sound type

Area of origin	Sound group	Gen1	Gen2
Serbia	Non-merging hard post-alveolars	2.8%	0.0%
	Merging hard post-alveolars	4.2%	41.7%
	Merging alveolo-palatals	6.9%	33.3%
	All	4.6%	25.0%
Bosnia	Non-merging hard post-alveolars	0.0%	4.2%
	Merging hard post-alveolars	4.2%	52.0%
	Merging alveolo-palatals	4.2%	47.9%
	All	2.8%	34.0%
Croatia	Non-merging hard post-alveolars	2.8%	0.0%
	Merging hard post-alveolars	30.6%	8.3%
	Merging alveolo-palatals	36.1%	83.0%
	All	23.1%	30.6%

5.2 Do the second-generation speakers merge more than the first-generation speakers?

The absolute number of incorrect responses is much higher in Gen2 than in Gen1 in total as well as for each subgroup of participants separately. A GLMM analysis has been conducted controlling for generation as a factor. The difference between Gen1 and Gen2 is statistically significant ($p = 0.005$). For Serbian-origin participants, the difference between Gen1 and Gen2 is significant with $p = 0.046$, highly significant for Bosnian speakers ($p = 0.001$), however, this difference turned out to be insignificant for Croatian-origin participants ($p = 0.739$).

5.3 Does the duration of the stay in the United States influence the level of merger in Gen1 speakers?

With regards to H2, in which we predicted that the longer the duration of stay in the United States, the more likely a speaker is to merge the categories. We found that our results do not support this hypothesis. In fact, the duration of

stay in the U.S. in Generation 1 speakers had no effect on the level of merger ($p = 1$). Figure 5, which was added in response to a reviewer's request, shows this lack of correlation between length of stay in the United States and accuracy of merging tokens. For our purposes, a higher level of merger is indicated by a lower accuracy of properly identifying merging tokens.

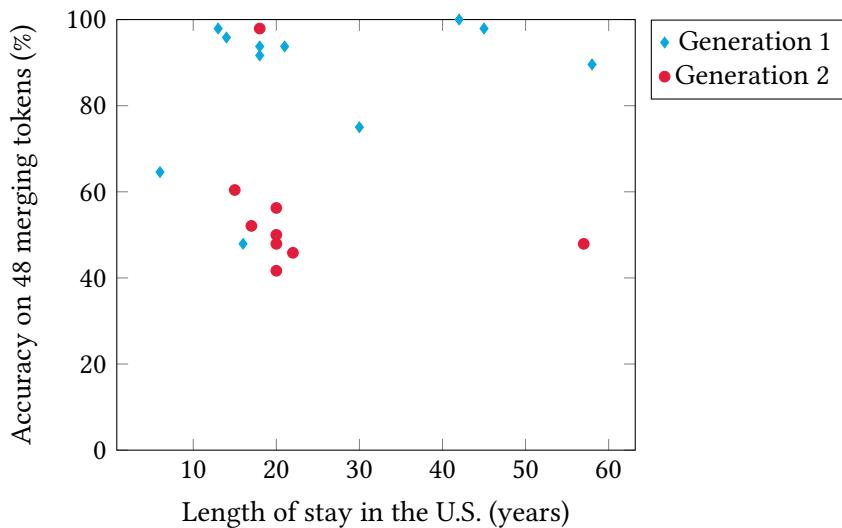


Figure 5: Length of stay in the U.S. vs. accuracy on merging tokens

5.4 Is either of the merging categories more “difficult”?

Further, we have looked at the identification ratios across sound categories. Post-alveolars are split into the affricates (potentially merging with alveolo-palatal series) and fricatives (which do not have corresponding alveolo-palatal fricatives, thus, do not merge with any other existing category). While the identification of [š] (a non-merging category) is, as expected, close to 100%, for all heritage speakers – Generation 1 and 2 – the correct identification of voiceless affricate categories is only slightly above 80%.

Figure 6 shows the perception accuracy by sound type for voiceless sounds. In Figure 7, the sound type accuracy for each of the three sound types, alveolo-palatal merging, post-alveolar non-merging, and post-alveolar merging, is represented for the two generations separately. The dashed line represents the perception accuracy of Generation 1, while the solid line represents the accuracy

of Generation 2. The accuracy of the post-alveolar [š] is near 100%, which was expected as this sound is non-merging.

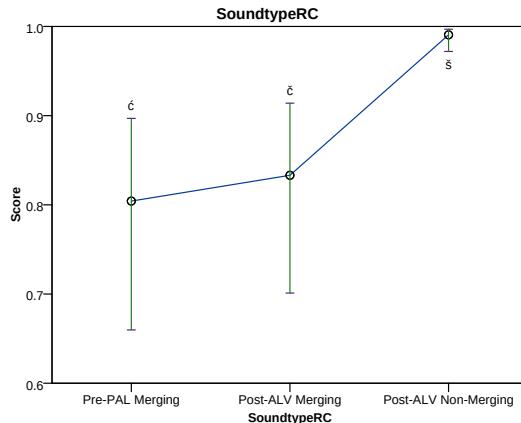


Figure 6: Perception in heritage speakers: alveolo-palatal (in the above graph, represented by ‘pre-palatal’ merging = [č], post-alveolar non-merging = [š], post-alveolar merging = [č]) (all heritage participants)

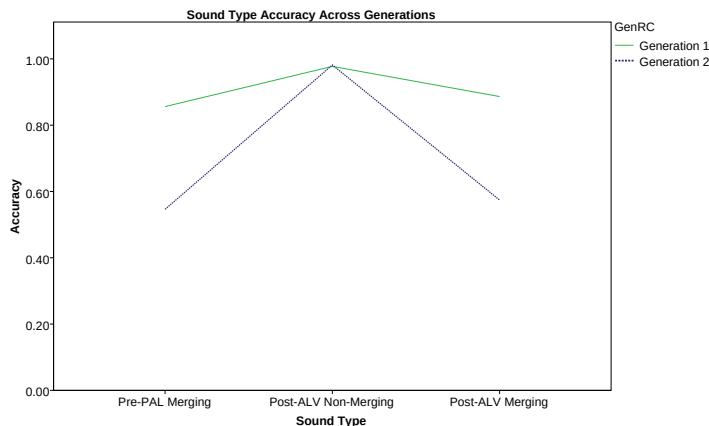


Figure 7: Accuracy of sound types. Key: dashed = Gen 1, solid = Gen 2; Alveolo-palatal (in the above graph, represented by ‘pre-palatal’) merging = [č/d], post-alveolar non-merging = [š], post-alveolar merging = [č/dž]

Contrary to what was expected, post-alveolar affricates and alveolo-palatal affricates reached similar level of accuracy in the identification task, however, the difference in the identification of the two merging categories was not significant,

neither for Generation 1 nor Generation 2. /š/ is correctly identified more often than both alveolo-palatal /č/ and post-alveolar /č/, for both generations and the difference is statistically relevant, see Table 6.

Table 6: Statistically relevant difference in the perception between sound type for voiceless sounds (OR = odds ratio, CI = confidence interval)

		Gen1 (OR[CI])	Gen2 (OR[CI])
alveolo-palatal merging & post-alveolar merging	č vs. č	- <i>p</i> = 0.386	- <i>p</i> = 0.671
alveolo-palatal merging & post-alveolar non merging	č vs. š	10.96 [2.85–42.06] <i>p</i> = 0.001*	42.69 [9.89–184.38] <i>p</i> = 0.000*
post-alveolar non-merging & post-alveolar merging	š vs. č	7.49 [1.07–29.05] <i>p</i> = 0.004*	48.18 [11.17–207.89] <i>p</i> = 0.000*

The goodness of the perception of alveolo-palatals is not statistically better or worse than the perception of post-alveolar affricates. This finding does not support the hypothesis that alveolo-palatals are more stable than post-alveolar merging affricates, which was based on the pilot data from an articulatory study by Cavar-etal2016. Non-merging categories (posterior fricatives) are sticking away from the rest in terms of accuracy of identification. Non-merging post-alveolars are approx. 7.49 times more likely to be identified correctly than merging post-alveolars and approx. 10.96 times more likely to be identified correctly than alveolo-palatals.

6 Discussion

Hypothesis 1, which states that Generation 2 speakers would merge more than Generation 1 speakers, is supported by our perception data. This result is not surprising. Merging is expected both because of intra-language tendencies, given that the contrast is typologically relatively uncommon, and second, because of the potential pressure from English, which also has only one place of articulation in the posterior area instead of two.

Since length of stay in the United States is not correlated to accuracy, hypothesis H2 is not supported by our findings. This is contrary to Veltman's finding from large-scale Spanish data conducted using U.S. Census data that longer residence in the United States is linked with greater language shift (Veltman 2000: 66). We believe that the tendency to merge might be critically influenced by a number of factors apart from the duration of stay in the new country, e.g. relatively high proportion of the use of BCS in Generation 1.

We encountered variation in the usage of BCS by generation of speakers. Generation 1 speakers, on average, report using BCS 42% of the time compared to only 20% for Generation 2 speakers. The more extensive usage in Generation 1 speakers may be a result of the relative language skills in the two languages. Generation 2 speakers, on the other hand, report using English 80% of the time compared to only 58% for Generation 1 speakers. We argue that this increased use of English, among other factors helps also to account for the lower accuracy results in Generation 2 speakers versus Generation 1 speakers. Further, the contrast between alveolo-palatals and post-alveolars is hard-coded into BCS spelling and with any level of education in BCS, it is very prominent and not likely to be obliterated once it is there for a speaker. Generation 2 speakers, per our definition, did not have a chance to participate in the formal education in Croatia-Bosnia-Serbia and were either not exposed or exposed to a lesser degree to the prescriptive norm of the homeland language. The other factors contributing to the lower performance in Generation 2 might include the level of formality in the interaction with the dominant language and the education in the dominant language.

Lastly, with regards to hypothesis H3, the difference between the “goodness” of perception between post-alveolars and alveolo-palatals is not statistically relevant, which does not provide support for the hypothesis in Cavar-etal2016. On the other hand, given the statistically relevant difference between merging and non-merging hard post-alveolars, our data provide strong evidence for the progress of merger.

Our results do not support the claim advocated by Polinsky (2018) that immigrant and heritage language varieties tend to retain conservative features, as was the case with early American English being more conservative than British English.¹² Perhaps the deciding factor is the fact that the process of merger had

¹²This situation of conservatism exists in several languages. See Kang-Nagy2012 for a discussion of Seoul Korean homeland and heritage speakers exhibiting the expected pattern of conservatism in the aspirated/lenis distinction in stops. Additionally, Thepboriruk (2015) gives an

started already in the homeland speech and was “imported” to the U.S. Our results support the opposite claim – that language change is facilitated in the heritage language context. Our study does not, however, provide much evidence as to what may be the factors behind the language change, whether the accelerating factor is the influence of the dominant language, or if it is unimpeded language-internal systemic pressures that contribute to the faster-rate language change. A difference between the Croatian/Bosnian heritage speakers with a higher level of merger and, on the other hand, Serbian heritage speakers with a lower level of merger indicates that this is due to the homeland dialectal differences, and then, that for the change to be accelerated in the heritage language, it has to be already well in progress in the homeland speech. A study of a heritage language with a similar contrast but no merger in progress in the homeland speech would provide some evidence to support either analysis.

Polinsky (2018) remarks that features which are “useful” in the dominant language tend to be retained in the heritage language. Our study does not contradict this observation. The distinction between alveolo-palatal and post-alveolar affricates is not utilized in English, thus, heritage speakers can afford to abandon the contrast. This perspective, however, assumes a uni-directional impact of the dominant language on the heritage language, a claim which is problematic. As some studies indicate, e.g. Lyskawa (2016), the dominant language of Generation 2 heritage speakers is different from the language spoken by monolingual native speakers of the dominant language, that is, the heritage speech influences the dominant language. The issue deserves further investigation.

The most obvious question is whether heritage speakers merge more than homeland speakers and the answer to this question is that we cannot be sure. Raw numbers comparison indicates that the combined group of both Generation 1 and Generation 2 heritage speakers merge more than “homeland” speakers in the study of Cavar-Hamann2011 on the perception of Croatian and Bosnian/Hercegovinian speakers. This is surprising to some extent because Cavar-Hamann2011 targeted the areas with the strongest merging dialects to the exclusion of areas with less merging dialectal areas. If we exclude the heritage speakers of Serbian origin, Bosnian/Croatian heritage participants in both Generation 1 and Generation 2 seem to perform worse than Bosnian/Croatian participants in Cavar-Hamann2011; see Table 7.¹³

One of the reviewers commented that the results of the two studies cannot

account from heritage Thai in which heritage teen speakers were consistently more conservative than their parents with respect to voiceless aspirated stop affrication.

¹³The homeland speaker data in Table 7 are from Cavar-Hamann2011.

Table 7: Accuracy of responses

	Correct	Incorrect
Serbian Gen1	94.9%	5.1%
Serbian Gen2	65.4%	34.6%
Bosnian/Croatian Gen1	85.1%	14.9%
Bosnian/Croatian Gen 2	52.4%	47.6%
Homeland speakers of Bosnian/Croatian	97.8%	2.2%

be compared for the sake of the differences in the methodology, primarily for two reasons: first, because the tokens used in the **Cavar-Hamann2011** study included Polish sounds, and second, because the homeland study did not include participants from Serbia.¹⁴ As for the former criticism, **Cavar-Hamann2011** have demonstrated that Croatian speakers perceive a categorical difference between hard and soft categories exceptionally well, and this is also the gist of the current heritage study. The Polish contrast between alveolo-palatal affricates and post-alveolars is rendered in a strikingly similar if not identical way as the prototypical rendition of the Croatian contrast, that is, the one from the non-merging Hercegovina areas. This is to be expected. Phonological inventories with comparable number of phonemes with comparable contrasts tend to be rendered phonetically in a similar way, as discussed, for example, in **Boersma-Hamann2008** and demonstrated by their simulation of the development of sibilant inventories. We admit that the strength of the effect might be attributed to the difference of focus and methodology between the current study and the homeland study. However, we are convinced that the numbers are indicative of a tendency, especially because they are also consistent with the comparison between heritage Generation 1 and Generation 2.

7 Conclusions

This paper discussed the results from a perceptual study with 20 heritage speakers of Bosnian/Croatian/Serbian living in the United States. Our study has shown

¹⁴Like in the current study, **Cavar-Hamann2011** used a forced identification task. They used Praat experiment environment instead of Paradigm, and the tokens were fricatives and affricates of Polish (**Boersma-Weenink_praat**). The arrangement of the responses on the screen was also the same, with “soft” consonant categories on one side and “hard” consonant responses on the other.

that heritage speakers have a high ratio of merger. The ratio of merger in the heritage speech is potentially higher than in that of homeland population, but a direct comparison is impossible given the available set of data. A difference has been observed between Generation 1 speakers with lower ratio of merger and Generation 2 with a higher level of merger. No direct correlation between the years of residence and the level of merger has been discovered for Generation 1. The findings of this pilot study contribute to the discussion surrounding heritage speakers and language change. Further research on the production of the merging sound will shed light on the interaction between perception and production in the bilingual heritage speakers. Finally, additional studies on the heritage speakers of other languages with a similar consonantal inventory will provide a commentary on the role of typological factors in the sibilant merger in heritage BCS in the U.S., as opposed to the role of English as the dominant language.

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Chapter 13

General-factual perfectives: On an asymmetry in aspect choice between western and eastern Slavic languages

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The paper addresses the issue of microvariation within Slavic aspect. Specifically, it investigates perfective general-factuals, which appear in Czech and Polish but not in Russian. It is shown that perfective aspect is used in Czech and Polish when the semantics of the VP of the sentence is such that reference is limited to unique events, or when reference to a unique event is contextually determined. Assuming that semantic aspects operate over VP-meanings, it is then argued that the semantics of perfective aspect in Polish and Czech includes a completedness condition and a uniqueness condition whereas the semantics of the Russian perfective, more strongly, encodes target state validity. This difference categorically bans perfective aspect from general-factual contexts in Russian, but not in Czech and Polish.

Keywords: microvariation, perfective, general-factual, target state, uniqueness, VP

1 Introduction

The present paper contributes to the discussion of microvariation within the realm of Slavic aspect. As is well-documented, the distribution of perfective and imperfective verb forms among contexts is not constant within the Slavic family (see, among others, Dickey15; Dickey18; Gehrke02; Wiemer08; Rivero10; Alvestad13; Gattnar13; Berger13; Rivero14; Duebbers15; FK15; FK18; Stunová 1991; 1993; Breu 2000; Petruchina 2000; Dickey 2000). Although there is typological reason to speak of “the Slavic-style aspect” (e.g. Dahl85; Plungjan11), it would be utterly wrong to consider the aspectual systems of the Slavic languages all the same.

The pioneering study on microvariation of aspect in Slavic is [Dickey \(2000\)](#). Based on disagreeing patterns of aspect choice (perfective or imperfective), Dickey analyzes the Slavic languages as clustering around two poles on a scale. The western languages represent one pole, the eastern languages the other one. Polish and Serbian and Croatian are diagnosed as occupying an intermediate region, as these languages share properties with languages of the western as well as with languages of the eastern group, see Table 1.

Table 1: [Dickey \(2000: 5\)](#)

WEST	TRANSITIONAL	EAST
	Polish	Russian
Sorbian		Belarusian
Czech		Ukrainian
Slovak		
Slovene		Bulgarian
Serbo-Croatian		

[Dickey15](#) presents a revision of the [2000](#) picture. The most important innovation is that the South Slavic languages (apart from Slovene) are no longer classified as members of the western or eastern groups, but are classified separately, see Table 2.

In this paper, I will be concerned with Czech, Polish and Russian. For the present purposes, therefore, the move from [Dickey \(2000\)](#) to [Dickey15](#) is by and large irrelevant. What matters is that Czech is treated as a member of the western group, that Russian is counted as an instance of the eastern group, and that Polish is treated as a language sharing properties with both these groups.

More specifically, I will look at the aspectual behavior of these three languages in general-factual usage. General-factual contexts are particularly interesting from a comparative point of view. The Russian-biased general wisdom is that general-factuals call for imperfective aspect. As has been observed, among others, by [Dickey \(2000\)](#), however, there are certain general-factual contexts in which Czech speakers, for instance, resort to perfective forms. The aim of the present study is twofold. The first goal is to describe the kinds of contexts in which the western language Czech displays general-factual perfectives, whereas the eastern language Russian displays general-factual imperfectives. Since the theoretical prediction for “transitional” Polish is unclear, we will always have a look at the choice that speakers of Polish make in the respective cases. As we will

Table 2: Dickey15

NORTH		
WEST	TRANSITIONAL	EAST
Czech	Polish	Russian
Slovak		Ukrainian
Sorbian		Belarusian
Slovene		
SOUTH		
TRANSITIONAL (tending west)		EAST (with deviations)
Bosnian		Bulgarian
Croatian		Macedonian
Serbian		

see, and as noted in Dickey (2000: 101), with respect to aspect choice in general-factual contexts Polish is not “in between”, but follows the Czech pattern. The second goal, in turn, is to explain the described differences by tracing them back to differences in the underlying semantics of perfectivity.

The paper is structured as follows: In §2 I will introduce the phenomenon of perfective general-factuals in Czech and Polish. In §3 I will discuss and reject the hypothesis (proposed by Dickey 2000) that these cases can be traced back to underlying achievement verbs. In §4 I will discuss and reject the hypothesis (suggested by Cummins 1987) that the decisive factor is lack of volition. In §5 I will discuss and reject the hypothesis (brought up by myself) that perfective general-factuals are explicable in terms of event uniqueness. In §6, however, I will argue that the uniqueness hypothesis is not entirely on the wrong track, showing that it will produce correct results if it is relativized to the syntactic domain of the VP. In §7 the situation in Russian will be taken into account. I will explain why general-factual contexts are per se incompatible with perfective aspect in Russian, and what this reveals about differences in the semantics of the respective aspectual categories in the western and eastern Slavic languages under consideration. §8 concludes the paper.

2 General-factual perfectives

Somewhere in the world wide web, a young Russian-speaking lady tells us ten facts about herself.¹ We are invited to read that she prefers to drink tea without sugar (fact 1), that she is 18 years old but feels like 16 (fact 8), that she once started piano lessons but soon quit in favor of choreography (fact 3), and so on. Of relevance for us is fact 6. The young woman is telling us that she has once fallen from a tree. The Russian sentence that she uses to express that is (1).²

- (1) Ja padala s dereva.
I fell.IPF from tree
'I (once) fell from a tree.'

This is a canonic instance of a Russian general-factual imperfective. A similar one is sentence (2), which the young lady uses to convey fact 7:

- (2) Na menja padal šifer.
on me fell.IPF roof
'I was (once) hit by a piece of roof.'

Russian general-factuals are characterized by reference to a single completed event only vaguely located in past time, with verbal morphology always being imperfective.³ What is interesting is that, if our young lady was Czech-speaking, she would have used the perfective verb form to convey her message:

- (3) Jako malá jsem spadla ze stromu.
as small AUX fell.PF from tree
'As a child I (once) fell from a tree'

What about Polish? Polish turns out to pattern like Czech:

- (4) Jako dziecko spadłam z drzewa.
as child fell.PF from tree
'As a child I (once) fell from a tree.'

¹<https://ask.fm/Nailyuta>

²I reduce grammatical information in the gloss to a relevant minimum. IPF is for imperfective, PF is for perfective aspect. Other abbreviations are explained at the end of the paper.

³Note that the definition of general-factuals used here does not cover cases of 'presuppositional' (Grønn 2004) / 'actional' (Padu1996) / 'anaphoric' (Mehlig 2011) imperfectives. Note furthermore that I restrict the scope of the term to past tense contexts, which is debatable.

The following pair of examples contrasting Polish general-factual perfectives (5) and Russian general-factual imperfectives (6) is taken from Wiemer01:

- (5) Czy Pan kiedykolwiek zgubił swój portfel?
 Q sir ever lost.PF REFL briefcase
 'Have you ever lost your briefcase?'
- (6) Vy kodga-nibud' terjali svoj košelek?
 you ever lost.IPF REFL briefcase
 'Have you ever lost your briefcase?'

The kind of data discussed so far are described in Dickey (2000: 95ff.). It is important not to overlook that in other cases of general-factuals, Czech and Polish resort to imperfective aspect, just like Russian does. The examples (7) to (9) may serve as illustration.

- (7) Ty kogda-nibud' doila korovu?
 you ever milked.IPF cow
 'Have you ever milked a cow?'
- (8) Už jsi někdy dojila krávu?
 already AUX ever milked.IPF cow
 'Have you ever milked a cow?'
- (9) Czy kiedykolwiek doiłaś krowę?
 Q ever milked.IPF cow
 'Have you ever milked a cow?'

We saw that Czech and Polish form *perfective* general-factuals, but that they do not always do so. It is only for a subset of general-factuals that these languages deviate from the imperfective coding holding in Russian throughout. The question that arises is: what precisely characterizes the contexts in which speakers of Czech and Polish use perfective forms to denote completed past events only vaguely located in time?

3 Achievements?

The first hypothesis to be discussed stems from Dickey (2000), reemphasized in Dickey18. According to Dickey, the use of imperfective aspect in the languages of

the western group presupposes a temporal extension of the denoted event. Given this, speakers will have to resort to perfective aspect whenever the predicate of the sentence is based on an achievement verb: “In the west [...] the impv forms of achievement verbs are unacceptable in contexts where one otherwise expects the impfv” (Dickey 2000: 124).

The idea may be restated in terms of the following hypothesis.

- (10) **Hypothesis H1:** Perfective aspect is used in general-factuals whenever the verb is an achievement verb because achievement verbs do not supply the temporally extended events required by imperfective aspect in Czech and Polish.

This builds on Dickey’s general conclusions about aspectual semantic differences between western and eastern languages. According to Dickey (2000: 107–109), the western imperfective expresses the notion of QUANTITATIVE TEMPORAL INDEFINITENESS, characterized as “the assignability of a situation to several points in time”. The eastern imperfective, by contrast, expresses the notion of QUALITATIVE TEMPORAL INDEFINITENESS, which is described as “the non-assignment of a situation to a unique location relative to other states of affairs”.

Consider example (4), for instance. Here the predicate is formed on the basis of a lexical verb which is arguably analyzable as characterizing achievement events. Being an achievement, the verb does not supply “several points in time”, which is, according to Dickey, a prerequisite for using the western imperfective. Therefore, in this case, the choice of imperfective aspect is no option for the speaker of Polish, and she has to use the perfective instead.

There is, however, counterevidence to Dickey’s proposal. To see why, consider the following example from Russian first:

- (11) A: A Niagarskij vodopad kogda-nibud’ zamerzal?
and N. water falls once froze.over.IPF
‘Did the Niagara Falls ever freeze over?’
- B: Da, esli ja ne ošibajus’, odnaždy zamerzal.
yes if I not make.mistake once froze.over.IPF
‘Yes, if I am not mistaken, it once froze over.’

As can be seen and as expected, Russian speakers use imperfective aspect here. Now, as can be seen in (12) and (13), speakers of Czech and speakers of Polish would use perfective aspect when expressing the same thing:

- (12) A: A Niagarský vodopád někdy zamrzl?
 but N. waterfalls ever froze.over.PF
 ‘Did the Niagara Falls ever freeze over?’
- B: Ano, pokud se nemýlím, tak jednou zamrzl.
 yes if REFL not.mislead then once froze.over.PF
 ‘Yes, if I am not mistaken, it once froze over’
- (13) A: Czy wodospad Niagara kiedyś zamarzł?
 Q water falls N. ever froze.over.PF
 ‘Did the Niagara Falls ever freeze over?’
- B: Tak, jeśli się nie mylę, kiedyś zamarzł.
 yes if REFL not mislead once froze.over.PF
 ‘Yes, if I am not mistaken, it once froze over’

Above we saw that, according to Dickey’s explanation of general-factual perfectives, the respective predicates are perfective because of a conflict between the meaning of the imperfective and the lexical meaning of the verb, and that the conflict arises with achievement verbs. Accordingly, the reason why (12) and (13) have perfective predicates should be that these predicates are formed from achievement verbs lacking a process component in their lexical-semantic structure. The problem is that, if (12) and (13) were based on verbs lacking such a component, we would not expect these verbs to be (easily) used for denoting ongoing processes. As a matter of fact, however, they may be used in that function, quietly and without fuss. Consider the Polish example in (14):

- (14) Jezioro zamarza!
 lake freeze.over.IPF
 ‘The lake is freezing over.’

The sentence can be found on the internet, written above a photograph that shows a half-frozen lake. It is further elaborated by the following text:⁴

Po raz pierwszy tej zimy woda w Jeziorze Tarnobrzeskim zaczęła zamarzać dalej niż tylko kilkadziesiąt centymetrów od brzegu.
 [‘This winter for the first time the water of Lake Tarnobrzeg froze further than for just some dozens of centimetres from the lakeside.’]

⁴<http://tarnobrzeskie.eu/2016/01/23/jezioro-zamarza-zdjecia/>

Example (14) proves that the Polish predicate meaning ‘freeze over’ characterizes temporally extended events. Thus, it does supply “several points in time”. According to Dickey’s reasoning, this implies that the predicate should be lexically capable of taking on imperfective morphology. But then, why does it not show up in the imperfective in (13)?

One might, of course, object that the argument misses the point because Polish is not classified as a genuine western language within Dickey’s system. Fair enough, but consider the Czech equivalent to (14):

- (15) Jezero (právě) zamrzá.
lake right.now freeze.over.IPF
'The lake is freezing over (right now).'

There is an alternative way of understanding Dickey’s proposal.⁵ Maybe the claim is that the sentences (12) and (13) denote achievements *because* they are perfective. Following this suggestion, we should perhaps restate H1:

- (16) **Hypothesis H1'**: Perfective aspect is used in general-factuals whenever the speaker wants to refer to an achievement event because the use of the imperfective in Czech and Polish is restricted to reference to temporally extended events.

Yet the problem remains. Note that the situations referred to in (12) and (13) *are* temporally extended. As a matter of fact, the freezing over of a waterfall does never happen all of a sudden. It is a very time-consuming process indeed. Given that “in the default conceptualization there is a process component in these situations” (Dickey18), H1’ predicts that the natural translation of the Russian (11) into Czech or Polish should make use of an imperfective verb form. What is actually chosen, however, is a perfective verb form. This raises the unanswered question: why should the speaker want to present the freezing of the Niagara Falls as an instantaneous event?

I think that it is fair to conclude that, without further modification, Dickey’s solution to the puzzle of general-factual perfectives fails to explain cases like (12) and (13).⁶

⁵Thanks to an anonymous reviewer for pointing that out to me.

⁶FK15 raise a similar concern about Dickey’s analysis of the western imperfective.

4 Volition?

The next idea to be discussed has been stated by Cummins (1987) as a generalization to account for the situation in Czech:⁷

Czech absolutely prohibits the general-factual imperfective in all low-volitional predicates. This restriction admits no exception [...]: all Czech general-factual imperfectives have predicates with high agentivity.

(Cummins 1987:41)

For the sake of the argument let us suppose an intuitive understanding of volition, according to which it is “the cognitive process by which an individual decides on and commits to a particular course of action.”⁸ Given that, Cummins’ law may suggest the following hypothesis.

- (17) **Hypothesis H2:** Perfective aspect is used in general-factuals whenever the speaker wants to refer to a non-volitional event because (for some unclear reason) general-factual imperfectives in Czech and Polish are restricted to volitional actions.

This may, indeed, account for the cases that we came across with so far. Sentences like (3) report on accidental events, and accidents are by definition not accompanied by the individual’s decision on the course of events. Also sentences like (12) may be accounted for, as the event participant is inanimate and, hence, void of volition.

Nevertheless, the approach as it stands is not tenable. This has been shown in Dickey (2000: 101–102). Consider the following examples:

- (18) Už jsi z toho prkna někdy skočila?
already AUX from that diving.board ever jumped.PF
'Have you ever jumped from that diving board?'
- (19) Czy kiedykolwiek skoczyłeś z tej trampoliny?
Q ever jumped.PF from that diving.board
'Have you ever jumped from that diving board?'

These sentences clearly report on volitional actions, and yet the perfective form is used. If lack of volition was the explanation for the use of perfective aspect in

⁷In the quote, I have replaced Cummins’ “constative I” by the synonymous “general-factual imperfective”.

⁸[https://en.wikipedia.org/wiki/Volition_\(psychology\)](https://en.wikipedia.org/wiki/Volition_(psychology))

general-factual contexts, as the hypothesis H2 suggests, examples like Czech (18) and Polish (19) should not exist. So appealing as it may seem at first sight, we have to look for a better explanation.

5 Uniqueness?

The third hypothesis that I would like to check may be stated as follows:

- (20) **Hypothesis H3:** Perfective aspect is used in general-factuals whenever the speaker wants to refer to an event which is unique in the relevant context because perfectivity semantically expresses uniqueness in Czech and Polish.

To make sense of that, let us assume that the aspectual operators in Czech and Polish have the following semantics:⁹

$$(21) \quad \begin{aligned} \llbracket \text{IPF} \rrbracket &= \lambda P \lambda t \exists e [P(e) \wedge e \circ t] \\ \llbracket \text{PF} \rrbracket &= \lambda P \lambda t \exists e [P(e) \wedge e \subseteq t \wedge \neg \exists e' [P(e') \wedge e' \neq e]] \end{aligned}$$

Informally speaking, the PF-operator includes a completedness requirement ($e \subseteq t$) as well as a uniqueness condition ($\neg \exists e' [P(e') \wedge e' \neq e]$). The former requires that the denoted event must have reached its culmination point, and the latter requires that there is no possibility or, at least, no expectancy of a second event realization of the same type in the discourse context. The IPF-operator, by contrast, imposes only a very vague condition on interpretation ($e \circ t$). All that it requires is that the event time should, in this or that way, overlap the reference time (cf. Grønn 2004).

Given these assumptions, why do unique events call for perfectivity? Note that the two operators in (21) are of the same semantic type, differing only in specificity of content (every event that fulfills $e \subseteq t$ is an event that fulfills $e \circ t$). Therefore, the two aspectual operators may legitimately be analyzed as forming a Horn-scale (Sonne06; Sonne07). As they are located on a Horn-scale, the use of the less specific imperfective marker will trigger the conversational implicature that the speaker lacks evidence for using the more specific perfective marker. If the speaker wanted to avoid inviting this inference, because she does have sufficient evidence for categorizing the event as completed and unique, she

⁹For ease of readability, I will not indicate Krifka98's (Krifka98) temporal trace function $\tau(e)$, which maps events onto their run time. Thus, wherever e is related to t in the semantic representations to follow, this is meant to express that $\tau(e)$ is related to t .

would have to use the perfective. The use of the imperfective would otherwise misinform the hearer by suggesting that the event is either non-unique or non-completed. Taking into account that the latter option is out in general-factual contexts (as general-factuals always report on completed events, see above), we may rewrite H3 as H3':

- (22) **Hypothesis H3'**: Perfective aspect is used in general-factuals whenever the speaker wants to refer to an event which is unique in the relevant context because imperfectivity in Czech and Polish general-factuals implies reference to non-unique events.

Note, by the way, that if accidental events imply uniqueness (and I shall argue that they do), Cummins' law ("Czech absolutely prohibits the general-factual imperfective in all low-volitional predicates") may be viewed as a special case: If the expression of a unique, completed event attracts perfective aspect, and if accidents represent a special kind of unique events, then the expression of an accident should likewise attract perfective aspect.

Hypothesis H3 gains further plausibility in view of the fact that necessarily unique events (i.e. cases where world knowledge makes event repetition unlikely) require perfective aspect. Note that these sentences do not represent cases of general-factuals, as general-factuals require the event property to be in principle replicable (e.g. Padu 1996).

- (23) Jako malá jsem {pokácela / *kácela} náš jediný strom.
as small AUX felled.PF felled.IPF our single tree
'When I was young, I felled our one and only tree.'
- (24) Kiedy byłem młody,ściąłem nasze jedyne drzewo.
when was small felled.PF our single tree
'When I was young, I felled our one and only tree.'

And yet H3 and H3' are, like the previous hypotheses, confronted with counterevidence. Consider the following Czech dialogue.

- (25) A: Už mu odstraňovali slepé střevo?
already him took.out.IPF appendix
'Has his appendix been removed?'

B: Ano, už mu odstraňovali slepé střevo.
yes already him took.out.IPF appendix
'Yes, his appendix has been removed.'

What A and B are talking about here is a non-repeatable, i.e. unique event (everything else would enforce the conceptualization of an absurd scenario where a formerly removed appendix is re-implanted). According to hypothesis H3', this should rule out imperfective aspect in favour of the perfective. Contra to that prediction, however, the imperfective appears to be well suited to figure in the Czech example (25).

According to a comment by an anonymous reviewer, the situation in Polish seems to be the same as in Czech:

- (26) Czy mu {wycinali / wycięli} ślepą kiszkę?
Q him took.out.IPF took.out.PF appendix
'Has his appendix been removed?'

Here, too, it is possible to use an imperfective verb form under reference to a completed event, which is in conflict with H3/H3'.¹⁰

We have to conclude that, as it stands, the uniqueness hypothesis seems to be falsified.

6 Uniqueness!

In this section, I elaborate on hypothesis H3. The idea is to take the syntactic structure of the sentence into account and relativize the *semantic* uniqueness condition to the domain of the AspP. The new hypothesis (which is actually not "new" but merely more precise) will then be (27).

- (27) **Hypothesis H4:** Perfective aspect is used in general-factuals whenever the speaker wants to refer to an event which is unique in the relevant context because perfectivity semantically expresses AspP-uniqueness in Czech and Polish.

Let me explain. Above I proposed the denotations stated in (28).

- (28) $\llbracket \text{IPF} \rrbracket = \lambda P \lambda t \exists e [P(e) \wedge e \circ t]$
 $\llbracket \text{PF} \rrbracket = \lambda P \lambda t \exists e [P(e) \wedge e \subseteq t \wedge \neg \exists e' [P(e') \wedge e' \neq e]]$

¹⁰ According to the reviewer, the use of the perfective form leads to an interpretation involving target state relevance (see §7). It needs to be checked whether target state relevance is indeed obligatory when the perfective is used in (26). If yes: Does it follow from the semantics of the perfective? Then Polish would approximate the Russian pattern. Or does it rather follow from pragmatic inferences, presumably in competition with the imperfective? I must leave this issue open.

Now I remind of that these semantic assumptions presuppose the syntactic assumptions stated in (29):

- (29) [... [AspP {PF/IPF} [VP ... V ...]]]

What (28) basically says is that the use of a perfective form will always impose on interpretation the conditions of completedness and uniqueness. What (29) adds to that is that these interpretive conditions enter in above the syntactic level of VP (see Tate11; Tate13 for a defense). It is thus the semantics of the VP that the functions PF and IPF operate on. Several consequences follow from this kind of grammatical architecture.

The first consequence to be noted here is that if the VP-property entails event uniqueness, perfective aspect will have to be used. This prediction seems to be borne out (for the sake of space I will only use Czech examples):

- (30) Jako malá jsem [VP pokácela nás jediný strom]. = (23)
 as small AUX felled.PF our single tree
 ‘When I was young, I felled our one and only tree.’

In (30), the VP-property is one that can be realized only once in a given world. The VP thus narrows down the denotation set to unique events. According to (28) and (29), this strictly calls for the perfective (when presupposing completedness) because the speaker cannot but refer to a unique event. This prediction is in line with the use of perfective aspect observed in (30).

Let me now turn to the second consequence that follows from the above made assumptions, specifically concerning general-factuals. If the VP does not restrict denotation to unique events, then on semantic grounds alone the perfective is neither required nor excluded. Perfective aspect may be used, but *if* it is used, the expression of event uniqueness introduced by it should be pragmatically motivated. Below I present three contexts in which the pragmatic felicity of perfective use is met because expressing uniqueness is what the speaker wants to convey (the list is not meant to be exhaustive).

Context 1: The choice of the perfective expressing uniqueness is felicitous because the speaker wants to refer to an accident. This is the case in (3), repeated here for convenience.

- (31) Jako malá jsem [VP spadla ze stromu].
 as small AUX fell.PF from tree
 ‘As a child I (once) fell from a tree’

In (31), the speaker reports on an accidental event. It lies in the very concept of an accident that it is unexpected. If, unexpectedly, an accident happens to occur once (twice...), it will not be expected to occur a second time (third time...). Given this, communicating the existence of an accident, as in (31), or requesting the existence of an accidental event, as in (5) from above, will always invite an inference of uniqueness. It follows from hypothesis H4 that the perfective is to be used because otherwise the event would be understood as non-unique and, hence, as non-accidental.

Context 2: The choice of the perfective is felicitous because the speaker refers to an action that requires unusual skills. (32), for instance, refers to a dare. It should be read here as an answer to (18):

- (32) Ano, jako malá jsem z toho prkna [VP skočila].
yes as small AUX from that diving.board jumped.PF
'As a child I (once) jumped from that diving board.'

Here, arguably, the speaker answers the question of whether she has performed an action that (from the point of view of the questioner at least) requires extraordinary courage of those who perform it. Given this, the speaker may assume that the addressee (= questioner) takes the occurrence of such an action as unlikely. Similar to the case of accidents, it then follows that if the speaker states that she has performed the action once, she may be sure not to be expected to having performed it a second time. Thus, the expression of uniqueness, which H4 attributes to the use of perfective aspect, is well grounded in the context of (32).

(33) shows a similar example. Again, the kind of event is such that already one event realization will count as something special (from FK18):

- (33) Už jste někdy {dal / *dával} gólov?
already AUX ever gave.PF gave.PF goal
'Have you ever scored a goal?'

Context 3: The choice of perfective aspect is felicitous because the speaker refers to an extraordinary event, see (34).

- (34) V minulém století Niagarský vodopád [VP zamrzl].
in last century N. waterfalls froze.over.PF
'In the last century Niagara Falls froze over.'

It is very difficult to imagine that the Niagara Falls freezes over completely. Thus, already one such event is unexpected. If it turns out to have taken place, we will

not expect it to take place a second (let alone third, fourth, ...) time. Being about an unlikely event, (34) conveys uniqueness, and the attested choice of perfective aspect is correctly predicted by H4.

Finally, I turn to the case that rendered the hypothesis H3 wrong.

- (35) Ano, už mu [VP odstraňovali slepé střevo]. = (25)
 yes already him took.out.IPF appendix
 'Yes, his appendix has been removed.'

As can be seen, I have identified the element *mu* 'him.DAT' as being located outside of the VP. This might seem debatable, but see Dvorak10 for independent evidence in support of the assumption that benefactive *mu* is base-generated above VP. The point is that, if this syntactic decision can be maintained, the VP of (35) will turn out to supply a property describing a repeatable event. Countless appendicectomies are being carried out at the moment in the hospitals of the world. This does not deny the uniqueness intuition that we feel in view of (35). The intuition is real, but it arguably comes in by semantic composition taking place above VP. Since as a matter of fact every person has at most one appendix, the meaning of *mu* serves as a referential anchor for the otherwise non-specific meaning of *slepé střevo* 'appendix'. As a consequence, once the semantic contribution of *mu* is taken into account, the appendix will be understood to be a specific one. This, in turn, referentially anchors the whole event. What is described now is no longer a repeatable event, but a unique one.

Crucially, our new hypothesis H4 does *not* dictate perfectivity for (35). Since H4 incorporates the assumption that the aspectual operators PF and IPF take VP-meanings as input, and since the VP of (35) does not involve uniqueness, the use of imperfective aspect is not ruled out on semantic grounds. H4 predicts that the imperfective can be used in contexts where the uniqueness of the event is pragmatically irrelevant to what the speaker wants to convey.

Example (36) shows a similar case (adopted from Cummins 1987):

- (36) Už jsem večeřel.
 already AUX had.supper.IPF
 'I've already had supper.'

Speakers of Czech may refuse an invitation to supper by uttering (36). The utterance will be felt to address a unique event, and the use of imperfective morphology runs counter to the predictions of H3. Hypothesis H4, by contrast, may account for why the imperfective is allowed in that case. Again, we have to pay attention to the VP:

- (37) Už jsem [vp večeřel]. = (36)
already AUX had.supper.IPF
'I've already had supper.'

In (37), as in (35), the VP does not describe a unique event. The uniqueness-expectation associated with the sentence likewise enters in above VP, i.e. on account of further information provided by the linguistic and non-linguistic context within which the VP appears. The relevant pieces of information stem from: First, the (dropped) subject, which refers to a specific person as the agent of the event (the speaker). Secondly, the topic time, which is a specific day (today). Thirdly, script-knowledge which says that supper is normally taken once per day. In sum, the VP does not determine the uniqueness of the event in (36), the use of the perfective is therefore not mandatory, and imperfective aspect remains an option according to hypothesis H4.

To sum up, the observations made above amount to the following picture for Czech and Polish (which is valid not only for general-factual contexts):¹¹

- If the VP-property describes a kind of event that allows for one event realization at most, perfective aspect must be used.
- If the VP-property does not limit the event realization to be a singleton, both perfective and imperfective aspect are in principle possible.

In the latter case it is upon the speaker to decide on pragmatic grounds whether the denoted event should be understood as unique. If signaling uniqueness was intended by the speaker (because she perhaps wanted to refer to an accident, to a dare or to a sensational news event), she would have to use a perfective verb form. If, on the other hand, uniqueness is not what the speaker wants to signal, she should use an imperfective verb.

7 Taking Russian into account

As we saw above, Czech/Polish and Russian general-factuals do not pattern alike. The story told above takes care of the former languages. I have proposed denotations for PF and IPF in Czech and Polish that predict the aspectual choices made by the speakers of these languages. The open question is: why does Russian deviate from Czech/Polish in general-factual contexts?

¹¹The reader should bear in mind that the exposition presupposes that reference to completed events is intended.

My answer to that question follows Stunová (1991) who traces the differing distributions of the aspectual markers in Czech and Russian back to a difference in semantic content of the respective perfective category, the imperfective category being treated in Czech as well as in Russian as “an unmarked member of the aspectual opposition” (Stunová 1991: 297). Stunová’s (1991) results are summarized in (38):¹²

- (38) $\text{PF}_{\text{Czech}} \rightsquigarrow \text{TOTALITY}$
 $\text{PF}_{\text{Russian}} \rightsquigarrow \text{TOTALITY} + \text{CONNECTEDNESS}$

I propose to reinterpret the feature of ‘totality’ as comprising the features (conditions) ‘completedness’ and ‘uniqueness’. Given that move, Stunová’s semantics for the Czech perfective will be in perfect harmony with the conclusions that I have arrived at. The remarkable thing is that Stunová’s result is derived from empirical observations based on entirely different linguistic “parameters” (in the sense of Dickey 2000) than mine. While I am concerned here with the choice of perfective or imperfective aspect in general-factual contexts, Stunová (1991) discusses aspect choice in sequences of events, in the historical present, in generics and in pluractionals.

Stunová’s feature ‘connectedness’ is adopted from Barentsen (outlined in Barentsen95; Barentsen98). According to Barentsen98’s (Barentsen98) informal description, an event is “connected” if it is viewed from the perspective of the changes that it is imposing on its environment. Given this, Barentsen’s notion is virtually identical (or at least very similar) to Grønn’s (2004) pragmatic notion of target state relevance, which he derives from the semantic condition of target state validity.¹³ The notion of target state validity is formally defined by means of the condition $f_{\text{END}}(t) \subseteq f_{\text{TARGET}}(e)$.¹⁴

Given all this, we may rewrite (38) as (39):

- (39) $\text{PF}_{\text{Czech}} \rightsquigarrow \text{COMPLETEDNESS} + \text{UNIQUENESS}$
 $\text{PF}_{\text{Russian}} \rightsquigarrow \text{COMPLETEDNESS} + \text{UNIQUENESS} + \text{TARGET STATE VALIDITY}$

Now, formally, (39) may be stated as (40):

¹²It should be noted that the conclusions in Stunová (1993) differ from those in Stunová (1991).

¹³Here is where the difference between the two notions lies: while target state relevance determines that the event produces an occasion for subsequent events, connectedness is more broadly construed allowing alternatively for that the event starts from the final state created by a preceding event; see Dickey18 for discussion on that point.

¹⁴The condition $f_{\text{END}}(t) \subseteq f_{\text{TARGET}}(e)$ requires the reference time to end when the target state is in force.

$$(40) \quad \llbracket \text{PF}_{\text{Czech}} \rrbracket = \lambda P \lambda t \exists e [P(e) \wedge e \subseteq t \wedge \neg \exists e' [P(e') \wedge e' \neq e]] \\ \llbracket \text{PF}_{\text{Russian}} \rrbracket = \lambda P \lambda t \exists e [P(e) \wedge e \subseteq t \wedge \neg \exists e' [P(e') \wedge e' \neq e] \wedge f_{\text{END}}(t) \subseteq f_{\text{TARGET}}(e)]$$

The “semantically unmarked” imperfective will be the same in all of the discussed languages:¹⁵

$$(41) \quad \llbracket \text{IPF} \rrbracket = \lambda P \lambda t \exists e [P(e) \wedge e \circ t]$$

In (40), target state validity is implemented in the Russian perfective operator as an additional condition besides completedness and uniqueness. It should be noted, however, that the semantic content of target state validity by itself implies the conditions of uniqueness and completedness (Mittw08). Accordingly, (40) may be reduced to (42):

$$(42) \quad \llbracket \text{PF}_{\text{Czech}} \rrbracket = \lambda P \lambda t \exists e [P(e) \wedge e \subseteq t \wedge \neg \exists e' [P(e') \wedge e' \neq e]] \\ \llbracket \text{PF}_{\text{Russian}} \rrbracket = \lambda P \lambda t \exists e [P(e) \wedge f_{\text{END}}(t) \subseteq f_{\text{TARGET}}(e)]$$

Now back to the initial question of why Russian deviates from the Czech and Polish pattern in the way it does. The answer is that, given the Russian perfective operator as stated in (42), it will be ruled out for semantic reasons in any general-factual context. The condition of target state validity, and thus the perfective operator, is per se incompatible with general-factuals. To meet the condition of target state validity, the event has to have a specific reference time. General-factuals, by contrast, require the event to be located in a reference time which is “big and floating” (Grønn 2004: 273; see **omr16** for an explanation as to why this is so).

The incompatibility of general-factual interpretations and target state validity being associated with perfective aspect is, crucially, independent of whether or not the denoted event is unique. This is a non-trivial result, as it runs counter to Dickey18’s claim that “[t]he only way to establish that an event [...] is unique in time is to specify the temporal (and causal) context of the event in question. And this can only be done by providing information about prior and subsequent situations”.

An event that has a specific reference time is necessarily unique, but a unique event does not have to have a specific reference time. This is what sets Russian

¹⁵I wish to point out that under the proposed analysis (which closely follows Grønn 2004) the imperfective is, in fact, not unmarked/unspecified, but rather radically underspecified in comparison to the perfective. Thus, the approach is *not* Jakobsonian. The meanings in (40) and (41) all represent Hauptbedeutungen in the sense of Kury60.

apart from Czech and Polish, i.e. why Russian excludes general-factual perfectives, whereas Czech and Polish allow for them under the described circumstances.

8 Conclusions

In this paper, I have addressed the variation in aspect choice in general-factual contexts between Czech, Polish and Russian. I have argued that the asymmetry between Czech and Polish on the one hand, and Russian on the other hand, should be related to a difference in the semantics of the respective perfective operators. While perfectivity in the former languages introduces the condition that the denoted event is completed and unique, perfectivity in Russian more strongly requires that the reference time ends when the target state is in force. The imperfective operator is in each of these languages semantically vague in that it requires no more than that the reference time overlaps the event time.

I have shown that my conclusions are in line with much of the existing descriptive and theoretical literature on Slavic aspect. Specifically, I have made a case for the following claims:

- The two aspectual grammemes form a Horn scale, with the imperfective being semantically less specified than the perfective – in line with Sonne06 and Grønn (2004), and reminiscent of traditional explanations based on markedness (e.g. Maslov 1984: 15–16).
- The point just noted does not only hold for Russian, but for Czech and Polish as well – in line with FK18, but contra Dickey (2000: 105).
- The perfective operator in Russian entails target state validity – in line with Grønn (2004), and arguably compatible with Barentsen98 and Dickey (2000).
- The Russian perfective category has a more specific content than the Czech perfective category – in line with Stunová (1991) and Dickey18.
- Aspect is syntactically located outside of (above) the VP – in line with, e.g., Tate11.

Still, many questions remain open. How do the generalizations that I derived from general-factual contexts agree with the patterns of aspectual variation observed in other contexts (“parameters”)? The closeness to Stunová’s results gives rise to optimism, but these things have to be checked.

I wish to conclude with a further argument that one might bring forward in support of the story told in this paper. Dickey (2000: 112) reports that the Polish perfective in (43) is possible given the following scenario: The speaker, who had instructed the hearer to air the room beforehand, has entered the room, the hearer is around, and the (only) window is closed at the moment. This possibility of perfective aspect is in sharp contrast to the case of Russian, where the use of a perfective verb would strictly require the window to be open.

- (43) Czy otworzyłeś już okno?
Q opened.PF already window
'Did you already open the window?'

Drawing on a suggestion made by Dickey 18, I speculate that the absence of target state validity in the Polish perfective operator provides the reason why the perfective is usable here despite result annulment, and that the significance of uniqueness (that there is the expectancy of a single event realization) explains why the perfective is indeed used in the particular context at hand. This points to but one out of many intriguing issues that await investigation in the field of inner-Slavic aspectual variation.

Abbreviations

AUX	auxiliary	Q	polar question marker
(I)PF	(im)perfective	REFL	reflexive

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Chapter 14

Gender encoding on hybrid nouns in Bosnian/Croatian/Serbian: Experimental evidence from ellipsis

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In this paper, we report the results of an experimental study on the possibility of gender mismatches with ellipsis of a particular type of hybrid nouns in Bosnian / Croatian / Serbian (henceforth: BCS). Using agreement mismatches under NP ellipsis as a diagnostic for gender feature specification of hybrid nouns, we show that these nouns disallow agreement mismatches under NP ellipsis if natural gender (and a presupposition that it introduces) is present either in the antecedent or the ellipsis site. We argue that natural gender feature (masculine in our study) can optionally be present on the hybrid noun, and that its inclusion in ellipsis contexts leads to a violation of the standard identity requirement between the antecedent and the ellipsis site, namely merchant2001's (*merchant2001*) e-GIVENNESS.

Keywords: gender features, ellipsis, agreement, mismatches

1 Introduction: Hybrid nouns in BCS

Hybrid nouns have been a challenge for theories of agreement and NP structure (see corbett91; wandz03; aandalfg; aandalanguage; pesetsky14; kramerbook;

landau15; smith15; smith16; arsenijevicjksek; despichybrid17), as it seems that they can simultaneously bear two types of gender specification: (i) natural gender (reflecting the gender of the referent) and (ii) grammatical gender (assigned arbitrarily). In this paper, we focus only on the Class II hybrid nouns in BCS (ending in *-a*) which have grammatical feminine gender, but variable natural gender, which depends on the discourse referent.

Table 1: Some hybrid nouns in BCS

<i>-a</i>	<i>-ica</i>	<i>-(č)ina</i>
<i>mušterija</i> ‘customer’	<i>varalica</i> ‘cheater’	<i>junačina</i> ‘great hero’
<i>budala</i> ‘fool’	<i>propalica</i> ‘loser, failure’	<i>dobričina</i> ‘very good person’
<i>sudija</i> ‘judge’	<i>pajanica</i> ‘drunkard’	<i>drugarčina</i> ‘a great friend’
<i>tužibaba</i> ‘telltale’	<i>spavalica</i> ‘sleeper’	<i>lažovčina</i> ‘a big liar’

For instance, with a masculine referent, the noun *mušterija* (‘customer’) can trigger either grammatical feminine (1a)/(1b) or natural masculine agreement (1c)/(1d) (subject to speaker variability).

- (1) a. Milan nam je nov-a mušterija.
Milan us is new-F customer
‘Milan is our new customer.’
- b. Nov-a mušterija je kupila jaknu.
new-F customer is bought.F jacket.
‘A new (male or female) customer bought a jacket.’
- c. % Milan nam je nov-i mušterija.
Milan us is new-M customer
‘Milan is our new customer.’
- d. % Nov-i mušterija je kupio jaknu.
new-M customer is bought.M jacket.
‘A new (male) customer bought a jacket.’

With female referents, however, such nouns can only trigger feminine agreement:

- (2) Marija nam je nov-a / *nov-i mušterija.
Marija us is new-F new-M customer
‘Marija is our new customer.’

One could treat these as so-called ‘epicene’ nouns of the type found e.g. in Brazilian Portuguese and Greek, which can be used with both masculine and feminine referents without change in form (**bobaljikzocca**; **merchant14**; **kramerbook**). It has been proposed that such nouns are simply listed in the lexicon twice, each with a different gender feature (**merchant14**). However, such an approach to BCS hybrid nouns seems to be problematic, as there is evidence that these nouns can *simultaneously* bear natural and grammatical gender. For example, in (3) the adjective and determiner target different gender values of the noun, while (4) shows the same for the nominal modifier and the participle.¹

- (3) ov-i privatn-e zanatlje
 these-[M.PL] private-[F.PL] artisan.PL
 ‘these private artisans’ (corbett06)
- (4) Osm-a budala je bio-∅ mnogo kul tip ali su ga se
 eighth-[F.SG] fool.sg is been-[M.SG] very cool guy but are him REFL
 drugi malo plašili.²
 others little feared

‘The eighth fool was a very cool guy, but others were a bit afraid of him.’

This raises the question about the structural representation of such nouns: whether they do contain both types of gender feature simultaneously, and how exactly they should be represented. In what follows, we will answer these questions by using NP ellipsis as a diagnostic for the gender feature specification of BCS hybrid nouns.

¹Relative pronouns can also show different gender values than the attributive modifiers of a hybrid noun, as shown in (i), obtained at <http://vukajlija.com/seoski-fudbalski-tim-iz-beton-lige> <accessed 26.11.2016>.

(i) Lokaln-a pijanica, koj-i je završio sa igranjem fudbala...
 local-[F.SG] drunkard, who-[M.SG] is finished.M.SG with playing football
 ‘A local drunkard, who’s finished playing football..’

However, as pointed out by a reviewer, whether the relative pronoun agrees directly with the hybrid noun, or whether agreement is more indirect (since we are dealing with a non-restrictive relative clause in which the relative pronoun is more akin to regular pronouns, c.f. **devries06**) is an issue that requires further investigation. See **arsenijevicjuksek** for further discussion on hybrid agreement with relative pronouns.

²<http://magdajanovic.tumblr.com/post/85348961537/budala> <accessed 26.11.2016>.

2 Gender mismatches and NP ellipsis

There is a growing body of literature on the permissibility of gender mismatches under NP ellipsis (**nuneszocca10**; **bobaljikzocca**; **merchant14**; **sudospathas-sub20**; **barrie-cayuga16**). Based on whether gender mismatches under NP ellipsis are allowed or not, previous literature has identified three classes of nouns. The first type are the TWO-WAY ALTERNATING NOUNS (henceforth: the *doctor*-class), where a masculine antecedent can license deletion of a noun with a feminine referent, and *vice versa*:

(5) Two-way alternating nouns (*doctor*-class)

- a. O Petros ine kalos jatros, ala i Maria ine mia kakia ⟨jatros⟩.
the Petros is good.M doctor but the Maria is a.F bad.F doctor
'Petros is a good doctor, but Maria is a bad one.'
- b. I Maria ine kali jatros, ala o Petros ine enas kakos ⟨jatros⟩.
the Maria is good.F doctor but the Petros is a.M bad.M doctor
'Maria is a good doctor, but Petros is a bad one.'

(Greek; **merchant14**)

The second type are the NON-ALTERNATING NOUNS (henceforth: *brother*-class), which do not allow mismatches in either direction:

(6) Non-alternating nouns (*brother*-class)

- a. * O Petros ine kalos adherfos, ala i Maria ine mia kakia
the Petros is good.M brother but the Maria is a.F bad.F
<adherfi>
sister
- Intended: 'Petros is a good brother, but Maria is a bad one (sister).'
- b. * I Maria ine kali adherfi, ala o Petros ine enes kakos
the Maria is good.F sister but the Petros is a.M bad.M
<adherfos>
brother

Intended: 'Petros is a good brother, but Maria is a bad one (sister).'

(Greek; **merchant14**)

Finally, ONE-WAY ALTERNATING NOUNS (or the *actor*-class) allow a masculine noun to antecede an elided feminine noun (7a), but a mismatch in the opposite direction is ungrammatical (7b).

(7) One-way alternating nouns (*actor-class*)

- a. ?O Paulo é ator e a Fernanda também é ⟨atriz⟩.
the Paulo is actor and the Fernanda also is actress
'Paulo is an actor and Fernanda is too.'

b. *A Fernanda é atriz e o Paulo também é ⟨ator⟩.
the Fernanda is actress and the Paulo also is actor
Intended: 'Fernanda is an actress and Paulo is (an actor) too.'

With regard to their tolerance for gender mismatches, these three classes can be summarized as in Table 2:

Table 2: Classes of predicative nouns under ellipsis (*bobaljikzocca*)

Class	MASC antecedent FEM ellipsis	FEM antecedent MASC ellipsis	Type
<i>doctor-class</i>	☒	☒	Two-way alternating
<i>brother-class</i>	✗	✗	Non-alternating
<i>actor-class</i>	☒	✗	One-way alternating

We would expect that hybrid nouns in BCS pattern with one of these types. However, the additional complication with hybrid nouns is that there is evidence for the simultaneous presence of two gender features. Thus, we will try to gain some insight into their structure by testing the acceptability of gender mismatches with mismatched referents in either direction (8b)/(8c).

- (8) a. Milan mu je star-a mušterija, a Marija mu je nov-a <mušt.>
Milan him is old-[F] customer and Marija him is new-[F] cust.
'Milan is his old customer and Marija a new one.'

b. ?Milan mu je star-i mušterija, a Marija mu je nov-a <mušt.>
Milan him is old-[M] customer and Marija him is new-[F] cust.
'Milan is his old customer and Marija a new one.'

c. ?Marija mu je star-a mušterija, a Milan mu je nov-i <mušt.>
Marija him is old-[F] customer and Milan him is new-[M] cust.
'Marija is his old customer and Milan a new one.'

3 Experiment

The aim of the experiment was to discover whether an agreement mismatch was tolerated when masculine agreement was found either the antecedent (8b) or the ellipsis site (8c), i.e. whether the hybrid nouns under study were two-way alternating, one-way alternating, or allowed no alternation at all when the noun had natural masculine gender (indicated by the agreement on the adjective). Considering previous theories (**nuneszocca10**; **bobaljikzocca**; **merchant14**; **sudospathas-sub20**), the (im)possibility of a mismatch should be an indicator of (i) the difference in the quality of gender features (i.e. differences in their semantics or morphosyntactic representation) and (ii) the licensing conditions on ellipsis (i.e. identity requirements between the antecedent and the ellipsis site). Finally, sentences in which both adjectives show feminine agreement, regardless of the gender of the subject, were expected to be grammatical, as the hybrid nouns in question have grammatical gender as a formal feature.

In order to verify the grammaticality of gender mismatches under NP ellipsis, we ran an online acceptability judgement study.³ The experimental design involved the factors in (9). The first factor involves the type of agreement the adjective has with a masculine subject and has two levels (grammatical agreement MF vs. natural agreement MM) (9a), which should serve as an indicator of the type of gender on the hybrid noun (grammatical vs. natural). The second factor pertains to agreement with feminine subjects and has only a single level (FF, both grammatical and natural agreement) (9b). The final factor regards the position of the masculine referent and has two levels: in the first clause, or in the second clause (the one with NP ellipsis) (9c), which should indicate whether natural gender can function as an antecedent for ellipsis and whether it can be found in the ellipsis site. The $2 \times 2 \times 1$ combination of factors in (9) yield the four experimental conditions in Table 3.

(9) Factors (manipulated within items)

- a. AGREEMENT WITH MASCULINE SUBJECT; two levels: grammatical (MF) and natural (MM)
- b. AGREEMENT WITH FEMININE SUBJECT; one level: FF
- c. CLAUSE; two levels: first and second

Some example test sentences for each condition are given below. Each contains two clauses coordinated by the conjunction *a* ‘and’ and an elided noun in the

³For a detailed description of the design and for all the materials see <https://osf.io/r3npz>.

Table 3: Experimental conditions

Factors and levels			Conditions
	M.SUBJ.AGR	CLAUSE	F.SUBJ.AGR
1	MF	first	FF
2	MM	first	FF
3	MF	second	FF
4	MM	second	FF

second conjunct. Sentences (10) and (12) were expected to be perceived as grammatical, while (11) and (13) were the relevant mismatching cases.

- (10) Jovan je redovn-a mušterija, a Milica povremen-a _____.
 Jovan is regular-F customer and Milica occasional-F
 'Jovan is a regular customer and Milica an occasional one.' MFFF
- (11) Jovan je redovn-i mušterija, a Milica povremen-a _____.
 Jovan is regular-M customer and Milica occasional-F
 'Jovan is a regular customer and Milica an occasional one.' MMFF
- (12) Milica je povremen-a mušterija, a Jovan redovn-a _____.
 Milica is occasional-F customer and Jovan regular-F
 'Milica is an occasional customer and Jovan a regular one.' FFMF
- (13) Milica je povremen-a mušterija, a Jovan redovn-i _____.
 Milica is occasional-F customer and Jovan regular-M
 'Milica is an occasional customer and Jovan a regular one.' FFMM

Since masculine agreement with hybrid nouns is not accepted by all speakers, a control sentence involved only masculine referents and agreement (i.e. the condition MMMM) (14).

- (14) Uroš je redovn-i mušterija, a Tomislav povremen-i _____.
 Uroš is regular-M customer and Tomislav occasional-M
 'Uroš is a regular customer and Tomislav an occasional one.' MMMM

Furthermore, we included the following additional controls: a grammatical baseline with feminine agreement and all feminine referents FFFF (15), and an ungrammatical baseline FMFM, involving masculine agreement with feminine referents (16).

* Jovan je redovna mušterija, a Milica povremena.

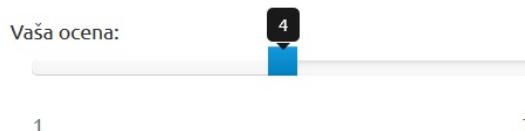


Figure 1: Example experimental item

- (15) Jelena je tešk-a dobričina, a Ljubica umerenij-a _____.
Jelena is heavy-F good-person and Ljubica moderate-F
'Jelena is a really good person and Ljubica less of a one.' FFFF
- (16) Stanislava je velik-i škrtica, a Dušanka darežljivij-i _____.
Stanislava is big-M scrooge and Dušanka more.generous-M
'Stanislava is a big scrooge and Dušanka a more generous one.' FMFM

A total of 18 controls were included, 6 per combination (all of them the same in every list, see below). There were 96 test sentences altogether, with 24 sentences per condition. All lexical items were balanced for proper names (24 male, 24 female), adjectives (48) and hybrid nouns (6). We used a Latin square design where the 96 test sentences were distributed in 4 lists, such that each list contained different items for every condition. Each participant thus saw only items from one list, i.e. 24 test items, 6 items per condition. The experiment was coded using LimeSurvey ([limesurvey](#)) and run online via the LimeService platform. Sentences were presented one-by-one in a random order. Each participant saw 62 sentences (24 test items + 18 controls + 20 fillers) and was asked to give a grammaticality judgement on a 7-point Likert scale (1 = completely bad, 7 = sounds excellent) by dragging a centered slider either to the left or right to indicate their response (see Figure 1).

The experiment was performed by 164 volunteers, 131 female and 33 male, aged 16–66. Participants reportedly spoke different varieties of BCS: Bosnian (22 speakers), Croatian (5 speakers) and Serbian (136 speakers). None of the participants were paid or otherwise compensated for their participation.

4 Results

Figure 2 shows the distribution of responses under each condition from all participants for the baselines (first column) and our four experimental conditions

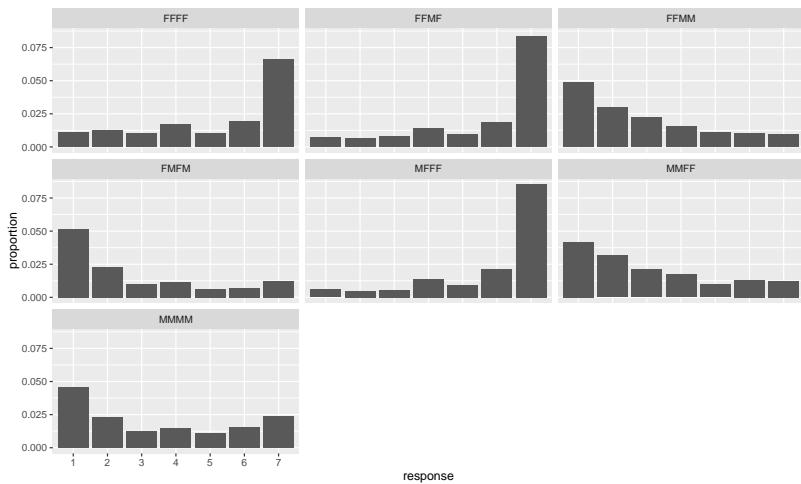


Figure 2: All responses by all participants.

(second and third column). The baselines show strong grammaticality effects: feminine agreement with feminine subjects was rated as grammatical, while masculine agreement was unacceptable. A u-shaped type of distribution for MMMM (masculine agreement with masculine subjects) suggests that although the ma-

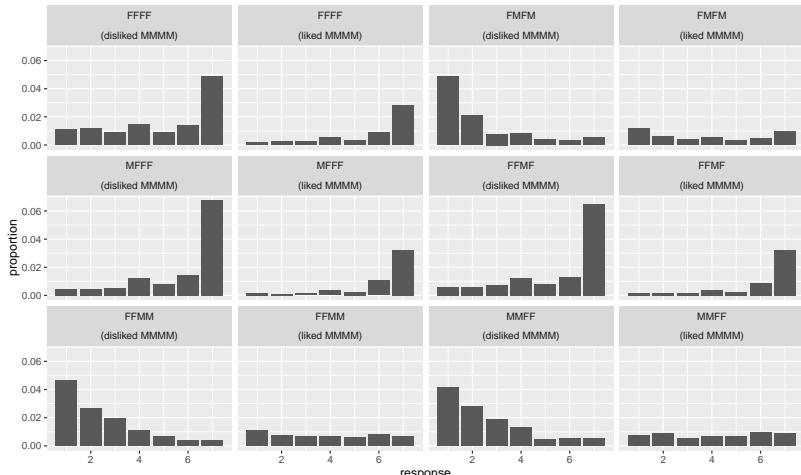


Figure 3: All responses by all participants according to whether the speaker liked or disliked the sentences in the MMMM condition.

jority of speakers dispreferred it, some speakers clearly did find it grammatical. With mismatching subjects, feminine agreement (FFMF and MFFF) was rated as grammatical, as shown in the second column. More gradient (un)acceptability was found for FFMM and MMFF (third column).

We compared the responses for all conditions based on whether speakers liked the MMMM combination (median rating ≥ 4) or disliked it (Figure 3). In total, 51 speakers found the MMMM combination grammatical. The overall picture shows that the distributions concerning the grammatical patterns are fundamentally the same, regardless of whether the speaker liked MMMM or not (the first two rows). However, there was in fact a difference for conditions with low acceptability scores (FFMM and MMFF), as it can be seen in the final row of Figure 3. Speakers who liked MMMM showed no clear preference or dispreference for either of the mismatching combinations – they were perceived as equally bad.

Figure 4 shows the four crucial conditions just for those speakers who rated the MMMM baseline higher than 4. We see that the patterns with feminine agreement throughout were overwhelmingly acceptable and grammatical to these speakers, while the conditions with mismatches show more variation and received comparably lower scores.

To clarify whether the differences in these responses were statistically significant, we fitted an ordinal regression model with only condition as a dependent variable, and participant and hybrid_noun as random effects (see the Appendix

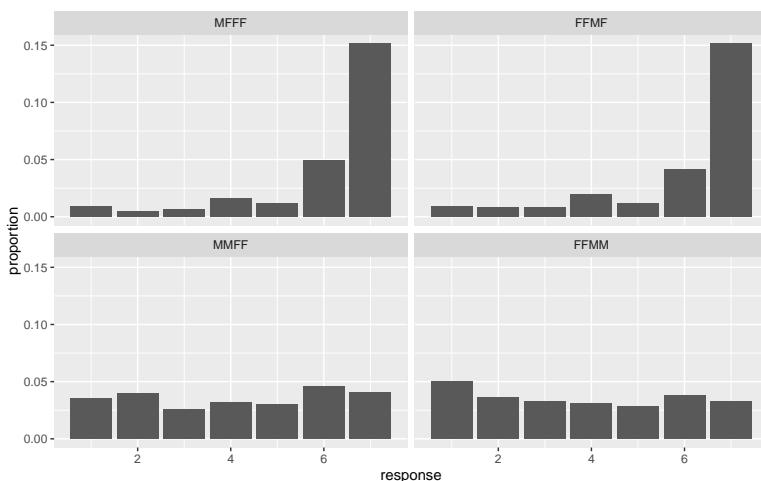


Figure 4: Responses by participants who liked MMMM (median rating ≥ 4)

for further details about the model).⁴

As the plot in Figure 5 shows, the factors with overlapping confidence intervals are not statistically different from each other. We see that **FFMF** and **MFFF** slightly overlap with 0, which means that they are not statistically different from the intercept (the grammatical baseline **FFFF**). On the other hand, **FFMM** and **MMFF** are statistically worse than the intercept, but not different from each other or the ungrammatical baseline **FMFM**.

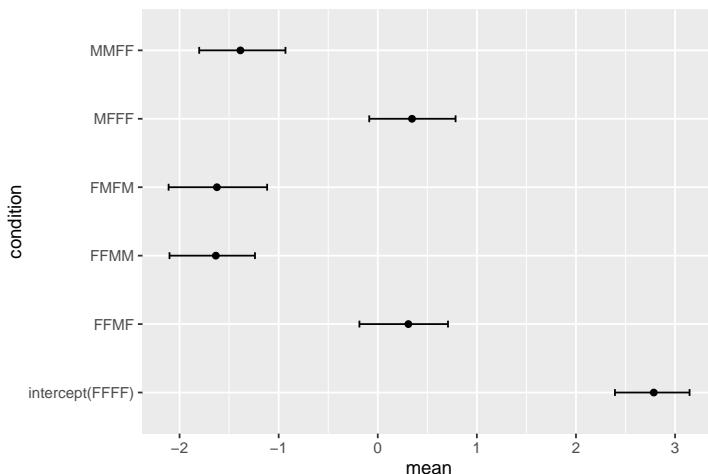


Figure 5: Posterior means and 95% confidence intervals for the Bayesian regression model.

The conclusion we can draw from this is that gender mismatches are possible in either direction as long as the adjectival agreement is feminine. This is shown in (17) and (18).

(17) Two-way mismatches possible with feminine agreement

- a. Jovan je redovn-a mušterija, a Milica povremen-a <mušterija>.
Jovan is regular-F customer and Milica occasional-F customer
'Jovan is a regular customer and Milica an occasional one.' MFFF
- b. Milica je povremen-a mušterija, a Jovan redovn-a <mušterija>.
Milica is occasional-F customer and Jovan regular-F customer
'Milica is an occasional customer and Jovan a regular one.' FFFM

⁴Ordinal regression assumes an ordered discrete response variable. This is exactly the kind of data one obtains from grammaticality judgement tasks. In the models, gender and region did not play a role.

(18) No mismatch possible with masculine agreement

- a. * Milica je povremen-a mušterija, a Jovan redovn-i 〈mušterija〉.
Milica is occasional-F customer and Jovan regular-M customer
'Milica is an occasional customer and Jovan a regular one.' FFMM
- b. * Jovan je redovn-i mušterija, a Milica povremen-a 〈mušterija〉.
Jovan is regular-M customer and Milica occasional-F customer
'Jovan is a regular customer and Milica an occasional one.' MMFF

Thus, with regard to the noun classes in Table 2, our hybrid nouns behave like nouns of the two-way alternating *actor*-class when there is agreement in grammatical gender (feminine), but they behave like non-alternating nouns of the *brother*-class if at least one of them bears natural gender (masculine).

5 Analysis

First, let us assume that the identity requirement for elided material involves merchant2001's (**merchant2001**) e-GIVENNESS (i.e. mutual entailment), as defined in (19), where existential (\exists)-type shifting is "a type-shifting operation that raises the expressions of type t and existentially binds unfilled arguments" while F-closure of α "is the result of replacing F-marked parts of α with \exists -bound variables of the appropriate type (modulo \exists -type shifting)" (**merchant2001**):

(19) e-GIVENNESS (**merchant2001**)

- An expression E counts as e-GIVEN iff E has a salient antecedent A and, modulo \exists -type shifting,
- (i) A entails $F\text{-clo}(E)$, and
 - (ii) E entails $F\text{-clo}(A)$.

This condition requires that mutual entailment holds between the antecedent and the ellipsis site. This prevents semantically-equivalent, non-matching ellipsis sites (20b) **merchant2001**.

- (20) a. Abby called Ben an idiot after Mary did 〈call Ben an idiot〉.
 $(\exists x. x \text{ called Ben an idiot} \leftrightarrow \exists x. x \text{ called Ben an idiot})$
- b. # Abby called Ben an idiot after Mary did 〈insult Ben〉.
 $(\exists x. x \text{ called Ben an idiot} \leftrightarrow \exists x. x \text{ insulted Ben})$

Following cooper83, it is often assumed that (natural) gender features can introduce presuppositions (sauerland03; sauerland08; heim08; kratzer09; spathas10;

sudo-diss). In Greek, non-alternating nouns of the *brother*-class have been claimed to contain a presupposition about gender of the referent (21) (**merchant14, sudospathas-sub20**).

- (21) a. $\llbracket \text{adherfos} \rrbracket = \lambda x_e : \text{MALE}(x). \text{SIBLING}(x)$
 - b. $\llbracket \text{adherfi} \rrbracket = \lambda x_e : \text{FEMALE}(x). \text{SIBLING}(x)$
- (22) a. * O Petros ine kalos adherfos, ala i Maria ine mia kakia
the Petros is good.M brother but the Maria is a.F bad.F
<adherfi>. sister
- Intended: ‘Petros is a good brother, but Maria is a bad one (sister).’
- b. * I Maria ine kali adherfi, ala o Petros ine enes kakos
the Maria is good.F sister but the Petros is a.M bad.M
<adherfos>. brother
- Intended: ‘Petros is a good brother, but Maria is a bad one (sister).’
- (Greek; **merchant14**)

The elided and antecedent noun have conflicting gender presuppositions, not mutually-entailing:

- (23) $\exists x : \text{MALE}(x). \text{SIBLING}(x) \leftrightarrow \exists x : \text{FEMALE}(x). \text{SIBLING}(x)$
- In the analysis of two-way alternating ‘epicene’ nouns, however, it is often assumed that they do not contain any lexical presuppositions about gender (24), and thus ellipsis is licensed (26).
- (24) $\llbracket \text{jatros} \rrbracket = \lambda x_e. \text{DOCTOR}(x)$
- (25) a. O Petros ine kalos jatros, ala i Maria ine mia kakia <jatros>. the Petros is good.M doctor but the Maria is a.F bad.F doctor
‘Petros is a good doctor, but Maria is a bad one.’
 - b. I Maria ine kali jatros, ala o Petros ine enas kakos <jatros>. the Maria is good.F doctor but the Petros is a.M bad.M doctor
‘Maria is a good doctor, but Petros is a bad one.’
- (Greek; **merchant14**)
- (26) $\exists x. \text{DOCTOR}(x) \leftrightarrow \exists x. \text{DOCTOR}(x)$

If we adopt a similar approach for hybrid nouns in BCS, then hybrid nouns agreeing in grammatical gender (feminine) do not contain any presupposition about gender, while the hybrid nouns that agree in natural gender (masculine) should have an additional gender presupposition. Assuming that the grammatical feminine gender of hybrid nouns does not contribute any gender presupposition, this would make it compatible with male and female referents:

$$(27) \quad \llbracket n_{[F]} \rrbracket = \lambda P \lambda x. P(x)$$

For masculine-agreeing hybrid nouns, let us assume that the denotation of natural gender is a partial identity function restricting the set of customers to the set of male customers (cooper83).

$$(28) \quad \llbracket n_{[M]} \rrbracket = \lambda P \lambda x : \text{MALE}(x). P(x)$$

The introduction of a gender presupposition with masculine agreeing hybrid nouns makes them incompatible with female referents.⁵

- (29) a. Marija nam je nov-a mušterija.
 Marija us is new-F customer
 ‘Marija is our new customer.’
- b. * Marija nam je nov-i mušterija.
 Marija us is new-M customer
 ‘Marija is our new customer.’

- (30) $\llbracket \text{novi mušterija} \rrbracket = \lambda x. \text{CUSTOMER}(x)$, defined only if x is male
- a. $\llbracket (29a) \rrbracket = \text{CUSTOMER}(\text{MARIJA})$
 - b. $\llbracket (29b) \rrbracket = \text{CUSTOMER}(\text{MARIJA})$, defined only if Marija is male
(presupposition failure!)

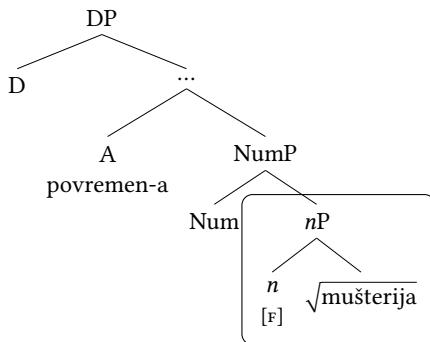
Returning to gender mismatches under ellipsis, in an example such as (31), involving feminine agreement in both clauses, both instances of *mušterija* will lack natural gender feature and the corresponding presupposition.

- (31) Milica je povremen-a mušterija, a Jovan redovn-a <mušterija>. FFMF
 Milica is occasional-F customer and Jovan regular-F customer
 ‘Milica is an occasional customer and Jovan a regular one.’

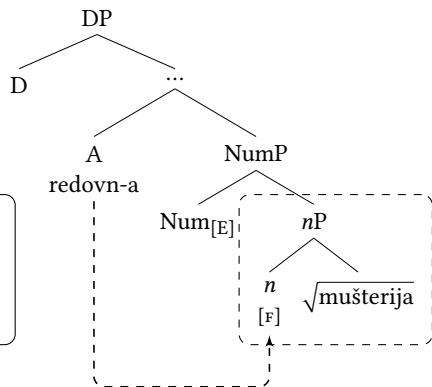
⁵While other theories rule out such examples based on competition with the feminine agreeing form (e.g. Maximize Presupposition; **bobaljikzocca** or Principle of Gender Competition; **sudospasphas-sub20**), we argue that the syntactic presence of both features is necessary based on instances of mixed agreement, such as (3).

In order to analyze the ellipsis patterns, we adopt the assumptions of Distributed Morphology that nouns are built up from a category neutral root and a head *n* that categorizes this root as nominal (hallemarantz93; harleynoyer99; kihm05; acquaviva09; kramerbook). Following kramerbook, we will treat gender for now as a feature introduced by *n* (although see below for more detail about the different possibilities of simultaneous separate structural encoding of natural and grammatical gender on hybrid nouns). We assume further that number features of nouns are introduced on a NumP. These assumptions yield the structure for (31) as given in (32), where ellipsis is triggered by an [E] feature on Num (merchant14; saabliptak16; saab-nomel).

(32) Antecedent:



Ellipsis site:



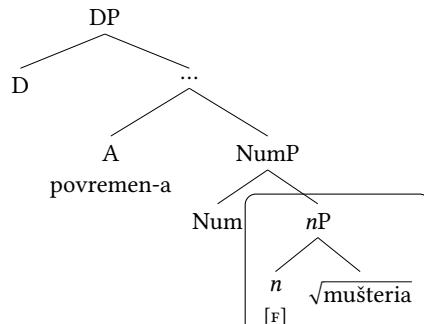
Importantly, from the point of view of the e-GIVENNESS condition in (19), mutual entailment is trivially satisfied since the elided material is identical.

$$(33) \quad \left[\begin{array}{c} nP \\ \diagdown \quad \diagup \\ n \quad \sqrt{\text{mušterija}} \\ \hline \exists x. \text{CUSTOMER}(x) \end{array} \right] \leftrightarrow \left[\begin{array}{c} nP \\ \diagdown \quad \diagup \\ n \quad \sqrt{\text{mušterija}} \\ \hline \exists x. \text{CUSTOMER}(x) \end{array} \right]$$

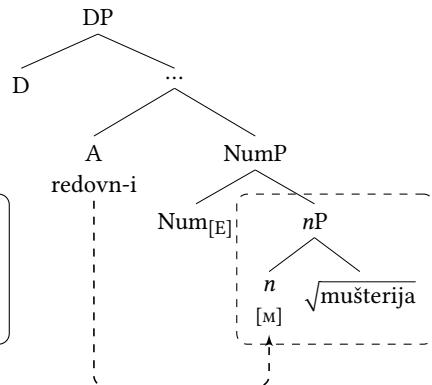
However, as soon as we have masculine agreement on one of the conjuncts, we necessarily have the relevant natural gender feature [M] of the referent, making the ellipsis unacceptable (34). The relevant structure, demonstrating the lack of feature identity, is given in (1).

- (34) * Milica je povremen-a mušterija, a Jovan redovn-i <mušterija>
 Milica is occasional-F customer and Jovan regular-M customer
 'Milica is an occasional customer and Jovan a regular one.' FFMM

(35) Antecedent:



Ellipsis site:



Recall that the masculine feature also introduces the presupposition that the referent is male. If there is no corresponding feature in the antecedent, then e-GIVENNESS is violated because there being a customer does not entail there being a male customer:

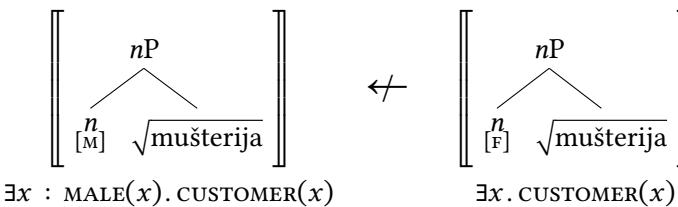
- (36)
- | | | |
|--|-------------------|--|
| $\boxed{\begin{array}{c} \textit{nP} \\ \textit{n} \quad \sqrt{\textit{mušterija}} \end{array}}$ | $\not\rightarrow$ | $\boxed{\begin{array}{c} \textit{nP} \\ \textit{n} \quad \sqrt{\textit{mušterija}} \end{array}}$ |
| $\exists x. \text{CUSTOMER}(x)$ | | $\exists x : \text{MALE}(x). \text{CUSTOMER}(x)$ |

The same situation holds if masculine agreement obtains in the antecedent:

- (37) * Jovan je redovn-i mušterija, a Milica povremen-a <mušterija>
 Jovan is regular-M customer but Milica occasional-F customer
 'Jovan is a regular customer and Milica an occasional one.' MMFF

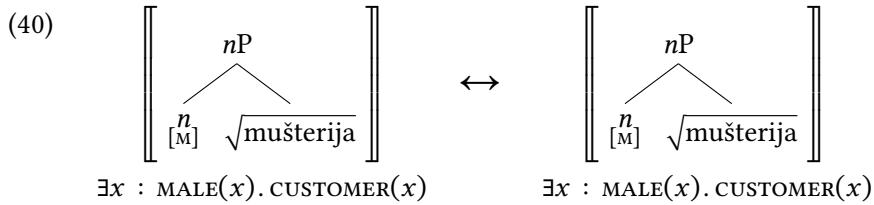
Since *mutual* entailment is required, the existence of masculine gender at only one of the conjuncts results in ungrammaticality, since the e-GIVENNESS requirement is not met.

- (38)



This accounts for why mismatches in referent gender are not tolerated if the adjective agrees in masculine in one conjunct only. As we expect, if we have two masculine referents (39), then mutual entailment is restored (39).

- (39) Uroš je redovn-i mušterija, a Tomislav povremen-i <mušterija>. Uroš is regular-M customer and Tomislav occasional-M customer 'Uroš is a regular customer and Tomislav an occasional one.' MMMMM



Exactly why masculine agreement with hybrid nouns (39) is not possible for all speakers is an open issue, and we suggest it could be due to not all speakers having the variant of *n* containing the additional [M] feature. We leave further examination of interspeaker variation to future research.

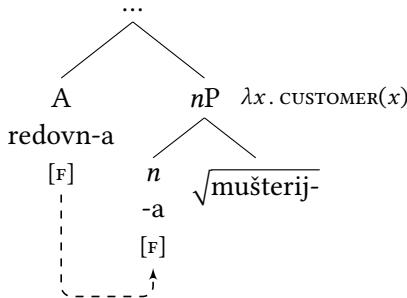
5.1 The encoding of natural and grammatical gender features

Since the nouns addressed in this paper have the possibility to simultaneously encode both the grammatical feminine and the natural masculine gender (as illustrated by (3), see also *wandz03*; *despichybrid17*; *puskar17*), a question that remains open is where exactly these features are encoded in the DP structure.

Some accounts (*matushansky13*; *pesetsky14*; *landau15*) assume grammatical gender to be encoded low in the noun's structure, as a property related to the nominal stem. Natural gender is optionally introduced on a higher functional projection. Under this approach, we would treat the grammatical feminine gender of our hybrid nouns as a property of *n*, while natural gender would be introduced at a higher functional projection (e.g. GenP, *picallo91*). The lower gender would not introduce any gender presuppositions, while the denotation of the gender on Gen would be a partial identity function restricting the set of customers to the

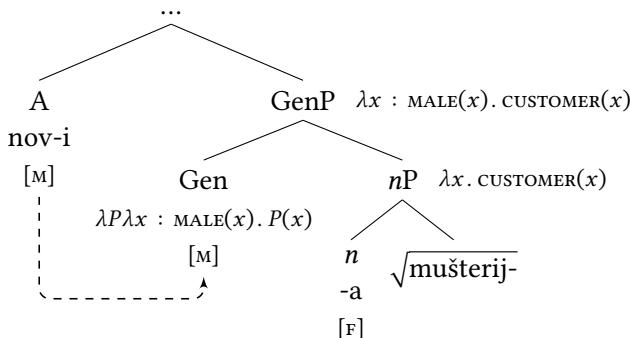
set of male customers (**cooper83**). If the male-referring hybrid noun triggers feminine agreement, adjectival concord then targets the grammatical gender feature on *n* (**40**).

(41)



For masculine-agreeing hybrid nouns, the closest target for Agree will be the higher masculine gender (41).

(42)



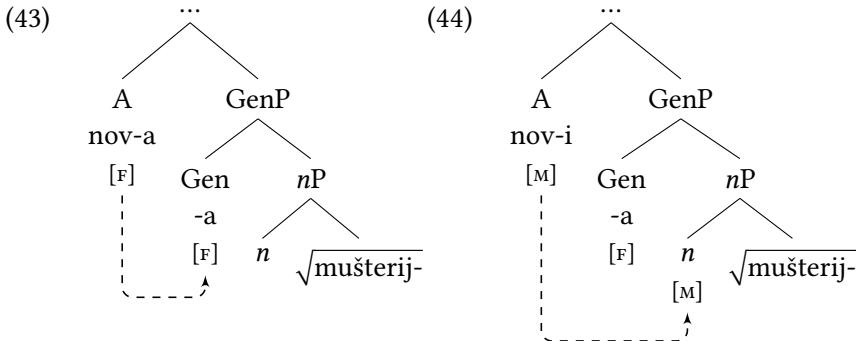
$$[\![nP]\!] = \lambda x. \text{CUSTOMER}(x)$$

$$\begin{aligned} [\![\text{GenP}]\!] &= [\![\text{Gen}]\!]([\![nP]\!]) \\ &= [\lambda P \lambda x : \text{MALE}(x). P(x)](\lambda x. \text{CUSTOMER}(x)) \\ &= \lambda x : \text{MALE}(x). [\lambda x'. \text{CUSTOMER}(x')](x) \\ &= \lambda x : \text{MALE}(x). \text{CUSTOMER}(x) \end{aligned}$$

Ellipsis would be licensed if neither the antecedent nor the elided noun project the GenP, or if both of them do. The existence of GenP and the masculine feature in either the antecedent or the ellipsis site would lead to a lack of mutual entailment and the concomitant impossibility of ellipsis, in the manner proposed above.

Another theoretical option would be to make the GenP the locus of grammatical gender, and the *n* of the natural one for the hybrid nouns of this particular type (see *puskar17*; *puskarhybrid17*). A hybrid noun with no natural gender would be represented as (42), while the noun with the natural gender feature

would have the structure in (43). Under this approach, the natural gender feature of *n* would have a more complex syntactic representation than the grammatical one. The gender probe is relativized towards the more complex gender. If this gender is present on the *n*, it will be the preferred goal for Agree (43). If it is absent, Agree would copy the higher grammatical gender (42) (see puskar17 for further detail).



If this analysis were to be adopted, the ungrammatical sentences would be ruled out by prohibiting any mismatches between the features of antecedent and those of the ellipsis site (cf. merchant13).

To sum up, both types of approaches to the structural position of gender features would in principle be compatible with the results of our experiment. Future research should then be tasked with teasing apart the two and defining the exact locus of the natural and grammatical gender features. However, what the results undoubtedly reveal is the necessity to represent the two types of features separately, as well as that they differ in quality, such that natural gender has an additional meaning component.

6 Conclusion

This paper has presented new experimental data from NP ellipsis showing that hybrid nouns in BCS show a split behaviour with regard to gender ellipsis: if they agree in feminine gender, then mismatches in referent gender are permitted for either the antecedent or elided noun. However, masculine agreement in either conjunct blocks gender mismatches. We have linked this to the optional presence of a natural [M] gender feature which represents a target for adjectival concord and introduces a gender presupposition. It is this gender presupposition that destroys the mutual entailment relation required by merchant2001's

(merchant2001) e-GIVENNESS requirement on ellipsis licensing. Consequently, this study suggest that natural masculine gender is syntactically absent when the adjective agrees in grammatical gender.

Abbreviations

F	feminine	REFL	reflexive
M	masculine	SG	singular
PL	plural		

Acknowledgements

We would like to thank Ana Bosnić and Joanna Zaleska for the help with the experimental design and coding, as well as Boban Arsenijević, Jelena Stojković, Andrew Nevins and the audience of FDSL 12 for the valuable comments and feedback.

Appendix

We use an ordinal bayesian regression model with the package **MCMCglmm** (Hadfield.2010) in R (**rcore**). We used non-informative priors (an inverse gamma with V=1 and nu=0.002). Table 4 presents the posterior mean estimates, the confidence intervals and equivalent of a Bayesian p value. The corresponding posterior estimates of the random effects can be shown in Table 5.

Table 4: Coefficients for the MCMC model with confidence intervals and cutpoints.

	post.mean	l-95% CI	u-95% CI	effect sample	pMCMC	
(Intercept)	2.7552	2.3839	3.1941	354.0	<0.002	**
condition FFMF	0.3172	-0.1073	0.7484	600.0	0.1433	
condition FFMM	-1.6084	-2.0599	-1.2233	487.7	<0.002	**
condition FMFM	-1.6095	-2.0645	-1.0990	600.0	<0.002	**
condition MFFF	0.3723	-0.0990	0.7610	516.1	0.0933	.
condition MMFF	-1.3541	-1.8228	-0.9690	514.2	<0.002	**
Cutpoints:						
	post.mean	l-95% CI	u-95% CI	effect sample		
cutpoint trait value.1	0.6284	0.5391	0.7129	90.48		
cutpoint trait value.2	1.0485	0.9316	1.1437	62.66		
cutpoint trait value.3	1.5598	1.4347	1.6683	30.25		
cutpoint trait value.4	1.9236	1.8068	2.0575	29.95		
cutpoint trait value.5	2.6803	2.5527	2.8159	43.93		

Table 5: Random effects for the MCMC model.

	post.mean	l-95% CI	u-95% CI	effect sample
participant	0.3557	0.2037	0.512	478.8
	post.mean	l-95% CI	u-95% CI	effect sample
hybrid noun	0.06491	0.004233	0.1571	600

Chapter 15

Extract to unravel: Left branch extraction in Romanian/Serbian code-switching

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Bošković (2008; 2012) argues that languages with and without articles differ considerably with respect to the structure of the nominal domain (among other differences), leading to a distinction between DP (languages with articles) and NP (article-less) languages. Namely, DP languages are proposed to have a functional layer (DP) above the NP where articles are presumed to be positioned, while lacking definite articles indicates the absence of this functional layer in a language, allowing for bare NPs. This structural difference has semantic and syntactic consequences, one of which is the (im)possibility of left branch extraction (LBE) of adjectives and adjective-like elements out of the nominal domain. Specifically, while LBE is allowed in NP languages, is it disallowed in DP languages (Bošković 2008; 2012). While (dis)allowing LBE is fairly straightforward in languages in isolation, here, I extend this test to mixed DP/NP structures resulting from Romanian/Serbian code-switching (CS). Following the DP/NP language distinction, I consider Romanian to be a DP language, disallowing LBE, and Serbian an NP language, allowing LBE. Consequentially, I apply the LBE of adjectives from internal and external arguments of the verb, with switches at various points in the derivation. I show that LBE is reliable in determining the points where CS occurs, whether we are dealing with an NP or a DP projection, but also in showing that mixing two languages may not necessarily result in a uniform system. In other words, through LBE, the structural flexibility resulting from different points of CS indicates that CS, like LBE, is highly contextual and sensitive to phases and phasal domains.

Keywords: left branch extraction, code-switching, Romanian, Serbian

1 Introduction

CODE-SWITCHING (CS) represents the alternation of elements from two languages during a single phrase, clause, or utterance (Poplack 1980; Gonzales Velásquez 1995; MacSwan 1999; Muysken 2000; among others). In this paper, the focus is on the CS in Romanian-Serbian bilinguals from a small, culturally Romanian town in the Republic of Serbia. In this paper, CS constructions, just like constructions belonging to any other natural language, are undergoing tests based on grammaticality judgements of bilingual native speakers. Specifically, here I investigate how relevant CS constructions that contain elements from Romanian (a DP language) and Serbian (an NP language) fare with respect to LEFT BRANCH EXTRACTION (LBE) of adjectives out of the TRADITIONAL NOUN PHRASE (TNP).¹ Given that LBE is allowed in NP but not DP languages (Uriagereka 1988; Bošković 2008; 2012), the combination of elements belonging to the two parameter settings (DP/NP) has consequences on the (im)possibility of LBE in CS. More importantly, I show that LBE is a reliable test to (i) identify which parameter setting prevails in certain environments, (ii) identify points of CS, and (iii) show that CS, like LBE, is contextual and it depends on the elements that participate in the switch during a spell-out domain.

The paper is organized as follows. §2 provides the demographics, methods, and type of data used for this study. In §3, basic assumptions and relevant LBE background are introduced. §4 gives the background of the relevant CS construction to introduces the main questions addressed in this paper, and §5 investigates LBE in CS. Finally, §6 concludes the paper and offers future research directions.

For ease of exposition, I will follow the common practice of marking elements from the two languages uniformly throughout the paper; in CS examples, Romanian elements will be in **bold**, and *Serbian* in *italics*.

2 Data and methods

Data for this study was gathered in the course of several years. Examples found in this paper are extracted from speech produced by Romanian-Serbian bilingual speakers from a culturally Romanian town called Uzdin, in Vojvodina, Serbia. The

¹The term traditional noun phrase covers both NP and DP, whichever applies in a given language, assuming the so called DP/NP parameter. Under the particular approach of Bošković (2014), the TNP in languages with articles is DP, and in article-less languages it is NP. TNP is generally considered a phase, consequently, DP is a phase in DP languages, while NP is a phase in NP languages.

methods of data gathering include interviews targeting spontaneous production, elicitation, and grammaticality judgements.²

Uzdin is one of the several towns in Serbia where the Romanian language, culture, and customs have been highly preserved and nurtured. The author has interviewed 8 subjects, with the age mean of 27. All subjects have at least a college degree, and have attended K-8 grades in Romanian, and high school and college in Serbian. This Romanian community is highly bilingual with a lot of code-switching occurring on a daily basis.

3 Relevant background

3.1 General assumptions

There are two underlying assumptions in this paper. The first is broad, referring to the approach and analysis of CS constructions. As argued by some authors (Bhatia-Ritchie 1996; BandiRao-denDikken 2014; Gonzales Velásquez 1995; den Dikken 2011), I do not assume CS to impose restrictions that apply to CS constructions alone. Rather, given that participating languages are natural languages that adhere to UG principles, I treat CS in the same way. The second assumption is specific, concerning the language pair in question. Following Bošković (2008; 2012), I consider Romanian and Serbian to differ with respect to whether they have or lack definite articles, consequently, whether they have or lack the DP layer.

3.2 DP/NP languages and left branch extraction

According to Bošković (2008; 2012), languages with and without articles differ in a systematic way. Empirically, having the NP or the DP parameter setting set has shown to have consequences not only on the structure of the TNP, but on a number of different syntactic and semantic phenomena, as well. This has allowed for the investigation of numerous crosslinguistic differences and similarities on a structural level. Bošković (2008; 2012) presents a number of generalizations that group languages based on the presence of absence of definite articles. The one relevant for current purposes is given in (1):

- (1) Only languages without articles may allow left branch extraction.

²For a more detailed overview discussing the subjects, data, and methods, I refer the reader to Petroj.

While I will only focus on the generalization in (1), I refer the reader to Bošković (2008; 2012) for a comprehensive list of generalization with discussions.

As stated, one of the tests used to capture the crosslinguistic asymmetry between DP and NP languages is LBE of adjectives and adjective-like elements out of the TNP, with the generalization that LBE may only be allowed in NP languages Bošković (2008; 2012). Starting with the Slavic language family, only Bulgarian and Macedonian disallow LBE, and these are the only two languages that have (definite) articles. In Romance, the only language that allows LBE is Latin, and this is also the only Romance language that lacks articles. A very important example that contributes to the LBE generalization is the case of Finnish, discussed in Franks (2007). Namely, Finnish is an article-less language and it allows LBE. Interestingly, as articles started to develop in colloquial Finnish, LBE constructions immediately became very marginal and unacceptable. We see a similar case of variation among a single language in Ancient Greek, where the languages belonging to two different periods pattern differently with respect to the presence of articles, and, therefore, to LBE as well. Koine Greek has articles and disallows LBE, while LBE was used productively in Homeric Greek – which lacks articles. There are a few more languages that allow LBE, and these are: Mohawk, Southern Tiwa, Gunwinjguan (Baker 1996), Hindi, Bangla, Angika, and Magahi. These are all article-less languages.³

Moving on to concrete examples, while LBE is disallowed in English (a DP language) (2), and in Spanish (a DP language) (3), it is allowed in Serbian (an NP language) (4):⁴

- (2) * {Expensive₁ / Those₁} he saw [NP t₁ cars]. (Bošković 2008)

- (3) a. * Supuestas₁ investigaba [DP t₁ estafas].
alleged.PL.F used.to.investigate.1SG frauds.PL.F
'I used to investigate alleged frauds.' (Spanish, Riqueros 2013)
- b. * Profesionales₁ ofrecía [DP traducciones t₁].
professional.PL.F used.to.offer.1PL translations.PL.F
'I used to offer professional translations.' (Spanish, Riqueros 2013)

³There is an additional requirement for a language to allow LBE – and this is agreement between the noun and the adjective. This, in turn, answers the question of why Chinese, that has very poor agreement morphology, disallows LBE even though it lacks articles. I will not be concerned with this requirement in this paper.

⁴Note that LBE is not possible with non-agreeing adjectives in Serbian (see Bošković 2013).

- (4) {*Skupa*₁ / *Ta*₁} je *vidio* [_{NP} t₁ *kola*].
 expensive.SG.F that.SG.F be.AUX.3SG seen.SG.M car.SG.F
 ‘He saw {an expensive / that} car.’ (Bošković 2008)

As predicted, English (a DP language) disallows, while Serbian (an NP language), allows LBE. To account for the contrast from above, Bošković (2013; 2014) proposes a contextual approach to phases in which the highest phrase in the extended domain of a lexical head acts as a phase. NP and DP languages then differ with respect to the phasal boundaries. Specifically, NP is a phase in NP languages, while DP is a phase in DP languages. Furthermore, assuming that the edge of each phase is visible to the next phase (Chomsky 2001), i.e., it can be available for extraction and movement, the adjective then occupies significantly different positions relative to the phasal edge in NP and DP languages. This is illustrated in (5), where the adjective is at the edge the TNP phase in NP languages (5a) and extraction of the adjective is allowed, versus DP languages in (5b), where DP is the phase, and the adjective is not at the edge of the TNP phase (the TNP being DP in this case). In order to be available for movement, the adjective has to move to DP due to the Phrase Impenetrability Condition (PIC) (Chomsky 2001), but the movement is blocked by antilocality, which requires the AP movement to cross a full phrase. In the case of (5b), AP does not cross a full phrase, only a segment.

- (5) a. NP languages

```

graph TD
    NP1[NP] --> AP1[AP]
    NP1 --> NP2[NP]
    AP1 -.-> NP2
  
```

b. DP languages

```

graph TD
    DP1[DP] --> Spec1[Spec]
    DP1 --> D1[D']
    D1 --> D01[D^0]
    D1 --> NP1[NP]
    D01 --> AP1[AP]
    D01 --> NP2[NP]
    NP2 -.-> AP1
  
```

When this is applied to Romanian and Serbian, the outcome is clear. Serbian (NP) allows LBE as in (6), and Romanian (DP) disallows it, as in (7):

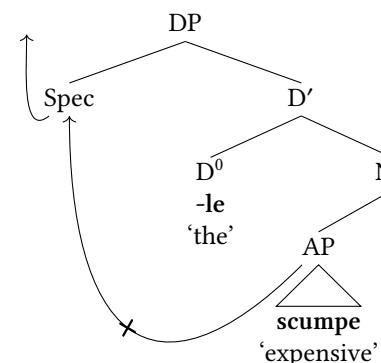
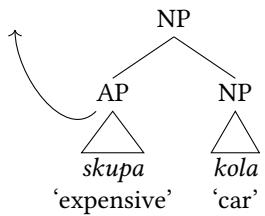
- (6) a. *Vidio je {skupa / ta} kola.*
seen.SG.M be.AUX.3SG expensive.SG.F that.SG.F car.SG.F
‘He saw {an expensive / that} car.’ (Bošković 2008)

- b. {*Skupa*₁ / *Ta*₁} je *video* [NP *t*₁ *kola*].
 expensive.SG.F that.SG.F be.AUX.3SG seen.SG.M car.SG.F
 ‘He saw {an expensive / that} car.’ (Bošković 2008)

(7) a. Am *văzut* {*scumpe* / *scumpe-le*}
 have.AUX.1SG seen.PTCP expensive.PL.F expensive-the.PL.F
automobile.
 cars.PL.F
 ‘I saw {expensive / the expensive} cars.’ (Petroj)
 b. *{*Scumpe*₁ / *Scumpe-le*₁} am *văzut*
 expensive.PL.F expensive-the.PL.F have.AUX.1SG seen.PTCP
 [DP *t*₁ **automobile**].
 cars.PL.F
 Intended: ‘I saw {expensive / the expensive} cars.’ (Petroj)

Structurally, this looks as follows: In Serbian, the LBE of adjectives (located in SpecNP) takes place through one movement out of the NP, as in (8a). In Romanian, however, a more complex movement is required. First, in order for the adjective to reach SpecDP, the AP (that has previously merged with D⁰ through Affix Hopping) has to proceed through SpecDP, which is the edge of the phase; only then would it be visible for further movement. The first movement, however, is blocked, by antilocality.⁵ This is illustrated in (8b).⁶

- (8) a. Serbian (NP language) b. Romanian (DP language)



⁵There are accounts where Romanian APs move to SpecDP (this is why they can precede the article, see Dobrovie-Sorin 1993; Abney 1987; Ungureanu 2006; a.o.). These accounts face a problem: if movement to SpecDP is possible, APs should be allowed to move out of DPs, too.

⁶For the complete analysis of definite article being hosted by the noun or the adjective, I refer the reader to Petroi.

While affairs are clear in Romanian and Serbian in isolation, the mixed parameter settings in Romanian/Serbian CS poses an important question with respect to which setting prevails in the relevant CS constructions; DP or NP. To address these issues, I will examine LBE of adjectives in CS, starting with simple transitive constructions. However, before testing LBE, the next section offers facts about elements participating in the CS TNP that are relevant in understanding the LBE of adjectives in CS.

4 Relevant code-switching background

As mentioned, Romanian and Serbian differ with respect to the DP/NP parameter setting – Romanian being a DP (having articles) and Serbian an NP language (lacking articles).

- (9) a. [DP -ul [NP **examen**]] ~ **examen-ul**
 the.SG.M exam.SG.M exam.SG.M-the.SG.M
 ‘the exam’

b. [NP *ispit*]
 exam.SG.M
 ‘an/the exam’

Following Bošković (2008; 2012) and the numerous generalizations that group languages according to the DP/NP parameter, Romanian and Serbian bring two clashing constructions and parameter settings interacting into combined structures. Although CS occurs on various levels (cf. Petroj), the relevant construction is represented in (10):

- (10) *teški ispit-ul*
 difficult.LF.SG.M exam.SG.M-the.SG.M
 'the difficult exam'

In this construction, the elements that participate in CS are the Romanian definite article *-ul*, the Serbian noun *ispit*, and the Serbian adjective *teški*. The counterparts of Romanian and Serbian constructions are illustrated below in (11a) and (11b) respectively:

- (11) a. **greu-l** **examen**
 difficult.SG.M-the.SG.M exam.SG.M
 'the difficult exam'

- b. *teški* *ispit*
 difficult.LF.SG.M exam.SG.M
 ‘the difficult exam’

Being either an NP or a DP language has additional consequences. In this case, it means different ways in which a language can express definiteness. Specifically, while Romanian expresses definiteness through definite articles on nouns (12a) or adjectives (12b), Serbian has an alternative way of obtaining definite versus indefinite interpretation. As illustrated in Table 1, Serbian has two lexical forms for adjectives: short form (SF) and long form (LF). These two forms are considered by some authors (Aljović 2002; Despić 2011; Talić 2014) to correspond to definite/specific (13a) and indefinite/non-specific (13b) interpretations, respectively.⁷

Table 1: Serbian shoft form vs. long form adjectives

	Short form	Long form
Masculine	nòv	nòv-i
Feminine	nòv-a new.SF	nòv-a: new.LF

- (12) a. **examen-ul** **greu**
 exam.SG.M-the.SG.M difficult.SG.M
 ‘the difficult exam’
- b. **greu-l** **examen**
 difficult.SG.M-the.SG.M exam.SG.M
 ‘the difficult exam’
- (13) a. *teški* *ispit*
 difficult.LF.SG.M exam.SG.M
 ‘the difficult exam’
- b. *težak* *ispit*
 difficult.SF.SG.M exam.SG.M
 ‘a difficult exam’

⁷For current purposes, I will simplify matters a bit and will consider the long vs. short form contrast to impose a definite vs. indefinite NP interpretation, respectively. For relevant discussion, see Aljović (2002); Despić (2011); Talić (2014); Stanković (2015); a.o.

What is most striking about the constructions like (10) is the combination of elements that is not found in either of the participating languages.⁸ In other words, the resulting structure is a combination of two definiteness-related elements – a Romanian definite article and a Serbian long-form (definiteness-imposing) adjective – in one TNP. Although coming from languages with different architectures, the elements form a cohesive and productive mixed structure. Given that both languages can express definiteness separately and that both definite elements are allowed in a single construction raises the question about the underlying structure of cases like (10). Specifically, does the resulting construction have the DP layer like in Romanian, or is it an NP construction like in Serbian?

Although having the definite article in the structure should indicate the presence of the DP layer, the fact that CS represents a mixture of (in this case) two parameter settings does not necessarily point towards the dominance of either one of the participating languages. On the one hand, the presence of the definite article may indicate that there is, in fact, a DP layer in (10), and that -ul is positioned in D⁰. On the other, given that all three elements (D, N, and A) undergo agreement in CS (*Petroj*), the definiteness may be licensed by the Serbian long-form adjective, and the DP layer may not exist.⁹ One way to confirm that the DP layer indeed exists in this type of construction is by turning to the contextual approach to phases. Recall that this approach says that any phrase can be a phase, as long as it is the highest in its domain. As seen above, the edge of the phase is available for further actions, while the rest of the construction is frozen inside the phase. That being said, there are two possibilities regarding the status of the CS TNP: (i) if there is no DP and the highest phrase in the TNP domain is NP, the adjective is in SpecNP and it should be extractable, allowing for the possibility of LBE; (ii) if there is a DP layer present, i.e. DP is a phase, the adjective being in SpecNP would make it too deeply embedded for extraction (only SpecDP being visible as the edge of the phase); LBE, in this case, will not be allowed.

To test this, the next session focuses on the LBE from the CS TNP from internal and external arguments respectively.

⁸For a comprehensive analysis and account of the CS TNP and the interaction of Romanian definite articles, Serbian nouns, and Serbian adjectives, I refer the reader to *Petroj*.

⁹By agreement, I refer to the forms that the adjective and the article take relative to the gender of the noun.

5 Left branch extraction in code-switching

5.1 Left branch extraction in Romanian and Serbian

As LBE is a reliable test for identifying the DP/NP parameter setting of a natural language, the same test is applied to CS constructions that include structures like (10), repeated below as (14).

- (14) *teški ispit-ul*
 difficult.LF.SG.M exam.SG.M-the.SG.M
 ‘the difficult exam’

Recall that as predicted by the generalizations in Bošković (2008), Romanian, being a DP language, disallows LBE and Serbian, an NP language, allows it. This is illustrated in (6) for Serbian and in (7) for Romanian, repeated below as (15) and (16), respectively:

- (15) a. *Vidio je {skupa / ta} kola.*
 seen.SG.M be.AUX.3SG expensive.SG.F that.SG.F car.SG.F
 ‘He saw {an expensive / that} car.’ (Bošković 2008)
- b. *{Skupa₁ / Ta₁} je vidio [NP t₁ kola].*
 expensive.SG.F that.SG.F be.AUX.3SG seen.SG.M car.SG.F
 ‘He saw {an expensive / that} car.’ (Bošković 2008)
- (16) a. *Am văzut {scumpe / scumpe-le}*
 have.AUX.1SG seen.PTCP expensive.PL.F expensive-the.PL.F
automobile.
 cars.PL.F
 ‘I saw {expensive / the expensive} cars.’ (Petroj)
- b. * *{Scumpe₁ / Scumpe-le₁} am văzut [DP t₁]*
 expensive.PL.F expensive-the.PL.F have.AUX.1SG seen.PTCP
automobile].
 cars.PL.F
 Intended: ‘I saw {expensive / the expensive} cars.’ (Petroj)

As seen above, facts are clear for Romanian and Serbian in isolation. In the remainder of this section, LBE of adjectives will be applied to CS TNP_s from transitive constructions and from the subject.

5.2 Transitive constructions

The paradigm below starts with (16), in which CS occurs within a TNP where the verb is Romanian, the definite article is Romanian, and the noun and the adjective are Serbian. As illustrated in (17b), LBE out of this TNP is disallowed. In (17), the verb is still Romanian, but even a fully Serbian TNP fails the LBE test. Interestingly, when the Romanian verb is replaced by its Serbian counterpart in (18), LBE improves drastically. Interestingly, while the Serbian verb *can* take a DP complement in (19a), extraction of the adjective is blocked in (19b), confirming that -ul may indeed point towards the existence of the DP layer.¹⁰

- (17) a. **Am** *trecut* *teški* *ispit-ul*.
 have.AUX.1SG passed.PTCP difficult.LF.SG.M exam.SG.M-the.SG.M
 'I passed the difficult exam.'
- b. * *Teški*₁ **am** *trecut* [t₁ *ispit-ul*].
 difficult.LF.SG.M have.AUX.1SG passed.PTCP exam.SG.M-the.SG.M
 'I passed the difficult exam.'
- (18) a. **Am** *trecut* *teški* *ispit*.
 have.AUX.1SG passed.PTCP difficult.LF.SG.M exam.SG.M
 'I passed the difficult exam.'
- b. * *Teški*₁ **am** *trecut* [t₁ *ispit*]
 difficult.LF.SG.M have.AUX.1SG passed.PTCP exam.SG.M
 Intended: 'I passed the difficult exam.'
- (19) a. **Am** *položila* *teški* *ispit*.
 have.AUX.1SG passed.SG.F difficult.LF.SG.M exam.SG.M
 'I passed the difficult exam.'
- b. ? *Teški*₁ **am** *položila* [t₁ *ispit*].
 difficult.LF.SG.M have.AUX.1SG passed.SG.F exam.SG.M
 'I passed the difficult exam.'
- (20) a. **Am** *položila* *teški* *ispit-ul*.
 have.AUX.1SG passed.SG.F difficult.LF.SG.M exam.SG.M-the.SG.M
 'I passed the difficult exam.'

¹⁰I would like to thank an anonymous reviewer for noticing the incomplete paradigm and pointing out the relevance of the example in (18).

- b. * Teški₁ am položila [t₁ ispit-ul].
 difficult.LF.SG.M have.AUX.1SG passed.SG.F exam.SG.M-the.SG.M
 Intended: 'I passed the difficult exam.'

Based on the above discussion, I take (dis)allowing LBE to indicate the presence or absence of the DP layer. The ungrammaticality of (18b) and (19b) then indicates that any Romanian element in the VP domain forces DP-hood on the object. What is particularly interesting here is that although the entire TNP is in Serbian, LBE still cannot take place. This suggests that although no Romanian D element is present overtly, there is still a DP projection here, which is not the case in (18), where LBE improves drastically with a Serbian verb introduced in the structure. Additionally, the paradigm in (16)–(19) confirms that regardless of the verb being Romanian or Serbian, the presence of a Romanian element in the object position will always have the DP layer.

Given that both Romanian and Serbian verbs can occur and take either a Romanian or a Serbian complement in CS, data from above indicates that Romanian verbs must take a DP complement even in CS as in (21a), while a Serbian verb can take either an NP complement as in (18b), or a DP complement, as in (20b).

- (21) a. Am trecut {examen-ul / ispit-ul} /
 have.AUX.1SG passed.PTCP examSG.M-the.SG.M examSG.M-the.SG.M
 * ispit}.
 exam.SG.M
 (Intended:) 'I passed {the exam / the exam / an/the exam}'.
- b. Am položila {examen-ul / ispit-ul} /
 have.AUX.1SG passed.SG.F examSG.M-the.SG.M examSG.M-the.SG.M
 ispit}.
 exam.SG.M
 'I passed {the exam / the exam / an/the exam}'.

We then have the generalization in (21):¹¹

- (22) Romanian verbs must take a DP complement, while Serbian verbs can take either a DP or an NP complement.

¹¹The pattern of certain elements allowing DP or NP arguments seems to extend beyond the VP domain, specifically, with respect to CS of conjuncts and coordinated structures. I refer the reader to Petroj for more examples and more detailed explanation.

I will now test the LBE of adjectives out of a ditransitive construction. Examples in (22) and (24) represent fully Serbian sentences with the LBE of the possessor out of the indirect object (IO) in (22b) and direct object (DO) in (25b). As expected, Serbian being an NP language, LBE is allowed in both cases. In contrast, when a Romanian object is introduced into the structure in (23) and (25), LBE out of the Serbian object in (23b) and (25b) leads to ungrammaticality.¹²

- (23) a. *Moja drugarica predstavlja svom prijatelju my.NOM friend.NOM introduce.3SG her.POSS.REFL.DAT friend.DAT Jovana.*
JovanACC
 ‘My friend introduces Jovan to her friend.’

b. *Svom₁ moja drugarica predstavlja her.POSS.REFL.DAT my.NOM friend.NOM introduce.3SG [NP t₁ prijatelju] [NP Jovana].*
 friend.DAT Jovan.ACC
 ‘My friend introduces Jovan to her friend.’

(24) a. *Moja drugarica predstavlja svom prijatelju my.NOM friend.NOM introduce.3SG her.POSS.REFL.DAT friend.DAT pe Jovan.*
PE Jovan
 ‘My friend introduces Jovan to her friend.’

b. * *Svom₁ moja drugarica predstavlja her.POSS.REFL.DAT my.NOM friend.NOM introduce.3SG [NP t₁ prijatelju] [DP pe Jovan].*
 friend.DAT PE Jovan
 Intended: ‘My friend introduces Jovan to her friend.’

¹²Pe in (23) is a dummy preposition assigning the accusative to its complement. It is comparable to the Spanish *a*, illustrated in (i).

(i) Lo vimos a Juan.
him.CL.ACC.M saw.1PL A Juan
'We saw John.'

(Spanish; Jaeggli 1986)

- (25) a. *Moja drugarica šalje svoju knjigu mom bratu.*
 my.NOM friend.NOM send.3SG her.POSS.REFL.ACC book.ACC my.DAT brother.DAT
 ‘My friend sends her book to my brother.’
- b. *Svoju₁ moja drugarica šalje [NP t₁ knjigu] [NP mom bratu].*
 her.POSS.REFL my.NOM friend.NOM send.3SG book.ACC
 my.DAT brother.DAT
 ‘My friend sends her book to my brother.’
- (26) a. *Moja drugarica šalje svoju knjigu fratelui meu.*
 my.NOM friend.NOM send.3SG her.POSS.REFL.ACC book.ACC
 brother.DAT my
 ‘My friend sends her book to my brother.’
- b. * *Svoju₁ moja drugarica šalje [NP 1 knjigu] [DP fratelui meu].*
 her.POSS.REFL.ACC my.NOM friend.NOM send.3SG
 book.ACC brother.DAT my
 Intended: ‘My friend sends her book to my brother.’

(23) and (25) show that when one object is in Romanian and the other in Serbian, LBE is not allowed even when the LBE is attempted out of the TNP that contains Serbian elements only. This is especially interesting since LBE was allowed once a Serbian verb was introduced into the structure in (18). (23) and (25) indicate that any Romanian element (not just the verb) in the vP/VP domain blocks LBE. With respect to the DP/NP status, it seems like both objects are DPs when one object is in Romanian. These examples then indicate that no structural mixing regarding the categorical status is allowed between the objects in a double object constructions (where one object would be an NP and one object a DP); if one object is a DP, both must be DPs. Consequently, if vP is considered a phase, the following generalization can be made.¹³

¹³An anonymous reviewer pointed out an interesting question about the generalization in (26), namely, that having a Romanian low/VP-adjunct after a Serbian ditransitive construction like the one in (i) might reveal additional (counter)evidence for the structure of mixing within the spell-out domain. While the sentence in (i.b) is only marginally acceptable, the subjects

- (27) No mixing of the categorical status of the TNP within a spell-out domain, where the spell-out domain is a phasal complement.

5.3 Subject

Given that having a Romanian element in either IO or DO blocks LBE from the other object (even when the other object is entirely in Serbian) it is important to test the extent of influence of the Romanian DP on the rest of the structure.

In the examples below, (27) represents a fully-Serbian example, with the possessor being extracted from the subject in (28b). This being a fully Serbian construction, LBE is allowed.

- (28) a. *Tvrđiš da moja drugarica predstavlja Petru*
 claim.2SG that my.NOM friend.NOM introduce.3SG Petar.DAT
 Jovana.
 Jovan.ACC
 ‘You claim that my friend introduces Jovan to Petar.’
- b. *Moja₁ tvrđiš da [NP t₁ drugarica] predstavlja [NP*
 my.NOM claim.2SG that friend.NOM introduce.3SG
 Petru] [NP Jovana].
 Petar.DAT Jovan.ACC
 ‘You claim that my friend introduces Jovan to Petar.’

Interestingly, when a Romanian element is introduced as the DO in (28) and as

reported challenges in processing the sentence, rather than in grammaticality, which can be assigned to prosodic factors of a fully Serbian LBE construction. I leave CS of adjuncts for future research.

- (i) a. *Moja drugarica šalje svoju knjigu mom*
 my.NOM friend.NOM send.3SG her.POSS.REFL.ACC book.ACC my.DAT
 bratu cu avion-ul.
 brother.DAT with plane.SG.M-the.SG.M
 ‘My friend sends her book to my brother via plane.’
- b. ? *Svoju₁ moja drugarica šalje [NP t₁ knjigu] [NP mom*
 herPOSS.REFL.ACC my.NOM friend.NOM send.3SG book.ACC my.DAT
 bratu] cu avion-ul.
 brother.DAT with plane.SG.M-the.SG.M
 ‘My friend sends her book to my brother via plane.’

the IO in (30), LBE out of a fully-Serbian Subject is permitted in both cases, as in (28b) and (30b).

- (29) a. *Tvrđiš da moja drugarica predstavlja Petru pe Jovan.*
 claim.2SG that my.NOM friend.NOM introduce.3SG Petar.DAT PE Jovan
 ‘You claim that my friend introduces Jovan to her friend.’
 b. *Moja₁ tvrđiš da [NP t₁ drugarica] predstavlja [NP Petru] [DP pe Jovan]*
 my.NOM claim.2SG that friend.NOM introduce.3SG Petar.DAT PE Jovan
 ‘You claim that my friend introduces Jovan to her friend.’
- (30) a. *Tvrđiš da moja drugarica šalje svoju knjigu fratelui meu.*
 claim.2SG that my.NOM friend.NOM send.3SG her.POSS.REFL.ACC book.ACC brother.DAT my
 ‘You claim that my friend sends her book to my brother.’
 b. *Moja₁ tvrđiš da [NP t₁ drugarica] šalje [NP svoju knjigu] [DP fratelui meu].*
 my.NOM claim.2SG that friend.NOM send.3SG her.POSS.REFL.ACC book.ACC brother.DAT my
 ‘You claim that my friend sends her book to my brother.’

These data contrast with (23) and (25) where the introduction of a Romanian internal argument blocked LBE out of the other internal argument. In contrast, LBE out of the subject is not affected by CS in the internal arguments of the verb. Based on these examples, the following generalizations can be made:

- (31) A Romanian internal DP argument forces DP-hood to the internal argument of the verb, but not to the external one.
- (32) No mixing of the categorical status of the TNP within a spell-out domain, where the spell-out domain is a phasal complement.

Notice also that a Romanian external DP argument does not force DP-hood on a Serbian internal argument, as indicated by the possibility of LBE in (33):

- (33) a. **Elev-ul** a *položio teški*
 student.SG.M-the.SG.M have.AUX.3SG passed.SG.M difficult.LF.SG.M
ispit.
 exam.SG.M
 'The student passed the difficult exam.'
- b. ? *Teški₁* **elev-ul** a *položio*
 difficultLF.SG.M student.SG.M-the.SG.M have.AUX.3SG passed.SG.M
 [NP *t₁* *ispit*].
 exam.SG.M
 'The student passed the difficult exam.'

6 Conclusions and further research

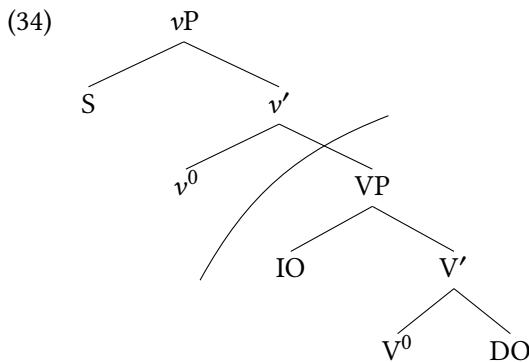
Due to the DP/NP difference between Romanian and Serbian, LBE has proven reliable in determining the points where CS may occur, but also in showing that mixing two languages may not necessarily result in a homogenous DP or NP system. In other words, this variant of CS shows flexibility when it comes to elements that are switched, but also regarding what parameter setting will prevail depending on when CS occurs in the derivation. When it comes to the interaction between Romanian and Serbian elements, the following generalizations hold:

1. Romanian verbs must take a DP complement, while Serbian verbs can take either a DP or NP complements.
2. A Romanian internal DP argument forces DP-hood onto the internal argument of the verb, but not onto the external one.

Importantly, LBE has also shed light on the flexibility of the CS construction to navigate through parameters.

3. No mixing of the categorical status of the TNP is allowed within a spell-out domain, where the spell-out domain is a phasal complement.

We can assume then that the vp/VP spell-out domain may look something like (34), whereby CS below the vP-level affects the entire phasal domain, but not the area above it:



Finally, more research needs to be done to correctly predict the points of CS in other langaages with different spell-out domains/phasal boundaries in order to unravel the rules and constraints, and identify the exact points of CS.

Abbreviations

ACC	accusative	NOM	nominative
AUX	auxiliary	PTCP	participle
CL	clitic	PL	plural
DAT	dative	POSS	possessive
F	feminine	REFL	reflexive
LF	long form	SG	singular
M	masculine	SF	short form

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Chapter 16

Unifying structural and lexical case assignment in Dependent Case Theory

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Dependent Case Theory argues against case assignment via a functional head (cf. chomsky2000; Chomsky 2001) and proposes instead that case is a result of a structural relation between two DPs (marantz91; mcfadden04; bakervinokurova; baker15). However, Dependent Case Theory cannot completely abandon case assignment via a syntactic head, as this mechanism accounts for lexical case (e.g. lexical dative). Furthermore, structural and lexical datives are morphologically identical and often behave similarly, and ‘just where the line should be drawn between the two is a theoretical matter’ (baker15). We argue for a unified approach to lexical and structural dative case assignment under Dependent Case Theory, implemented in a derivational fashion, via the operation Agree. While structural DAT is assigned as a high dependent case in the VP in the presence of a lower (later ACC) DP, lexical DAT is assigned in the same configuration, in the VP, in the presence of another silent or overt co-argument DP.

Keywords: dependent case, Agree, dative

1 Introduction: Dependent Case Theory

The Dependent Case Theory (henceforth DCT) is a result of the work of (marantz91; mcfadden04; bakervinokurova; baker12; baker15), among others, adopting similar ideas by yipetal87; bittnerhale96; kiparsky92; kiparsky2001; wunderlich97; stiebels2002. Case assignment in DCT relies primarily on marantz91’s (marantz91)

disjunctive case hierarchy, which distinguishes between the following types of case:

- (1) Lexically governed case > Dependent case (accusative and ergative) > Unmarked case (nominative and absolutive) > Default case

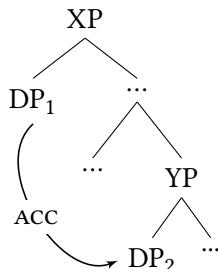
There are several steps in the case assigning process. In Step 1 all DPs selected by lexical items (verbs, prepositions, etc.) which idiosyncratically assign a particular case, receive the LEXICALLY GOVERNED CASE value from the designated head upon c-selection. In Step 2, pairs of remaining caseless DPs are inspected in their local domains. DEPENDENT CASE is assigned to them according to (a variation of) the following case assignment rules:

(2) Rules for dependent case assignment (baker15)

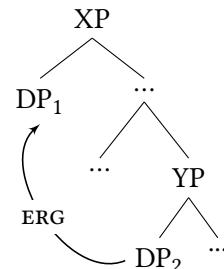
- a. If there are two distinct DPs in the same spell out domain such that DP₁ c-commands DP₂, then value the case feature of DP₂ as accusative unless DP₁ has already been marked for case (3).
- b. If there are two distinct DPs in the same spell out domain such that DP₁ c-commands DP₂, then value the case feature of DP₁ as ergative unless DP₂ has already been marked for case (4).

These rules lead to a four-way typology of case alignments (levinpreminger): The application of only the rule (2a) will lead to nominative-accusative alignment (3), while (2b) will yield ergative-absolutive alignment (4). If both parameters are simultaneously present in the same language, this would yield tripartite case systems (e.g. Nez Perce, where accusative and ergative can co-occur, see baker15) and if both parameters are switched off, the language has neither ergative nor accusative case marking.

(3) Nominative-accusative



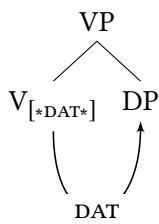
(4) Ergative-absolutive



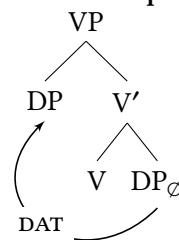
In Step 3, the remaining DPs that have not received case by means of competition with another DP, receive the UNMARKED CASE, which depends on the local domain in which the NP is found (nominative/absolutive in TP/CP, genitive in DP). Finally, DEFAULT CASE is assigned to fragment answers and free-standing DPs (*Who bought the bread? Him./^{*}He.*).

One of the evident problems for DCT is that DAT can be assigned either in Step 1, as lexically governed case, or in Step 2, as dependent case. If assigned as dependent case, DAT is considered to be assigned to a higher DP in the VP (bakervinokurova; baker15), which means that the case feature on a dative DP can sometimes be supplied by a lexical head and sometimes in a particular configuration in the VP and even though this feature has two completely different sources in the syntax, it is still recognised and realised as the same exponent by the morphology. We propose instead that assignment of dative via a lexical head can be abandoned in DCT. We claim that DAT can always be treated as dependent case assigned to a higher DP in a VP. In line with proposals by bittnerhale96; baker15 (for case assignment in general), wood2016 (for lexical accusative case in Icelandic), and bakerbobaljik (for inherent ergative case), instead of assuming that a verb comes with a lexical [*DAT*] case feature (5), we propose that the verb comes with a covert pseudo co-argument DP, which enables the assignment of lexical dative as dependent case to a higher DP in a VP (6).

(5) Lexical DAT via lexical head



(6) Lexical DAT as dependent case



Furthermore, there is an ongoing debate within the DCT on the timing of case assignment. While some authors want case assignment to be a syntactic process (see preminger-book and baker15, who times case assignment at Spell-Out, during linearization), others argue that dependent case is assigned at PF (marantz91; mcfadden04; bobaljikphi). In what follows, we will take the syntactic side of the debate and offer a derivational implementation via the operation Agree between two DPs, which will derive dependent case assignment as a narrow syntactic process, and explain the dative puzzle outlined above.

2 Structural dative in Serbian

In order to derive the assignment of structural dative case in double object constructions, this section offers a short empirical introduction on the structural relations between NOM, ACC and DAT arguments in BCS. The order of the indirect object (IO) and the direct object (DO) is mostly free in Serbian and both orders can be used in neutral contexts:

- (7) a. Slavica je predstavila sestri Marka.
Slavica.NOM is presented sister.DAT Marko.ACC
'Slavica presented Marko to her sister.' $V > DAT > ACC$
- b. Slavica je predstavila Marka sestri.
Slavica.NOM is presented Marko.ACC sister.DAT
'Slavica presented Marko to her sister.' $V > ACC > DAT$

However, there is reason to believe that IO > DO, i.e. (7a) is the base order of the two objects, while (7b) is derived by A-movement. The evidence from quantifier scope (aoun89; frey1989; bruening2001) shows that, while in the $V > DAT > ACC$ order only the reading where the quantifier in the IO scopes over the one in the DO is available (8a), the order $V > ACC > DAT$ allows for both readings (8b). The availability of the reading where the existential quantifier outscoops the universal one in (8b) indicates that the DO can reconstruct in its base position, below the IO.

- (8) a. Slavica je predstavila [_{DAT} jednoj drugarici] [_{ACC} svakog momka].
Slavica is introduced one.DAT friend.DAT every.ACC boyfriend.ACC
'Slavica introduced every boyfriend to a friend.' $\exists > \forall, * \forall > \exists$
- b. Slavica je predstavila [_{ACC} svakog momka] [_{DAT} jednoj drugarici].
Slavica is introduced every.ACC boyfriend.ACC one.DAT friend.DAT
'Slavica introduced every boyfriend to a friend.' $\exists > \forall, \forall > \exists$

Furthermore, maximal focus projection (from a focused NP to the entire clause) is possible only if we maintain the base word order (hoehle82; vonstechowuhmann;

haider92). A sentence in which movement has occurred should not be a good answer to the question *What happened?/What's new?*¹ With the focus on the DO, if the whole sentence is new information, focus is perceived as neutral if the sentence has the canonical word order (9a). However, the focus in (9b) is not necessarily new information focus, as it does not project to the entire clause; it can be interpreted as contrastive, which indicates that the order is not the base one and movement has taken place.²

- (9) ‘What happened?’

- a. [Slavica je poslala Marku PISMO]
Slavica is sent Marko.DAT letter.ACC
'Slavica sent a letter to Marko.'
- b. # [Slavica je poslala pismo MARKU]
Slavica is sent letter.ACC Marko.DAT
'Slavica sent a letter to Marko.' / 'It was Marko who Slavica sent a letter to.'

Finally, the order of object clitics in Serbian is always DAT > ACC, regardless of the order IO and DO noun phrases. stjepanovic-thesis and boskovic2001 assume that clitics move outside of their VP into Agr projections. The strict hierarchy between them suggests that this movement respects superiority.

- (10) a. Ti si poslala Nevenu pismo.
you are sent Neven.DAT letter.ACC
'You sent a letter to Neven.'
- b. Ti si mu ga poslala.
you are him.DAT it.ACC sent
'You sent it to him.'
- c. *Ti si ga mu poslala.
you are it.ACC him.DAT sent
'You sent it to him.'

- (11) a. Ti si poslala pismo Nevenu.
you are sent letter.ACC Neven.DAT
'You sent a letter to Neven.'

¹stjepanovic-thesis offers a similar argument for Serbo-Croatian.

²Even though the word order in (9b) is neutral, as noted in (7b), if the DAT argument is focused, the sentence sounds less neutral than its counterpart in (9a). We thank an anonymous reviewer for this insight. Moreover, factors such as animacy and givenness may contribute to enabling other orders in neutral contexts; see recent findings by titov17 for Russian and velnic-diss for Croatian.

- b. * Ti si ga mu poslala.
you are it.ACC him.DAT sent
'You sent it to him.'
- c. Ti si mu ga poslala.
you are him.DAT it.ACC sent
'You sent it to him.'

We conclude from these tests that the base word order of objects in Serbian is IO
> DO.

3 A derivational account of dependent case assignment

Following bakervinokurova; baker15; preminger-book; levinpreminger, we assume that case is assigned in narrow syntax. We adopt case feature notations from Lexical Decomposition Grammar, following kiparsky92; kiparsky2001; wunderlichjoppe; wunderlich97; stiebels2002:

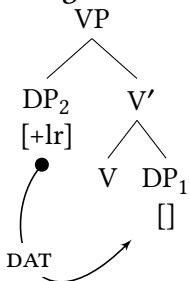
- (12) a. ACC: [+hr] 'there is a higher role'
b. DAT: [+hr +lr] 'there is a higher role and there is a lower role'
c. ERG: [+lr] 'there is a lower role'
d. NOM/ABS: [] no case features

The features [+hr] and [+lr] are assigned in the course of the derivation to argument DPs via the operation Agree. We assume that both standard 'downward' Agree and 'upward' Agree (chomsky86; chomsky91; kayne89; pollock89; koopman06) are possible options in the grammar (see also abels-phases as well as baker-agrbook's *baker-agrbook Direction of Agreement Parameter*). We propose that Agree applies between two DPs in a c-command relationship. When Downward Agree ($\downarrow \text{AGR} \downarrow$) applies, the higher of the two DPs in an asymmetric c-command relation probes down and receives the [+lr] from the lower one (see (13) below), and by Upward Agree ($\uparrow \text{AGR} \uparrow$), the lower DP probes upward and receives its [+hr] case feature from the higher DP (see (14) below). An important principle is that case valuation cannot take place if the *goal DP* already has a valued case feature (bittnerhale96; baker15). One DP can participate in multiple Agree operations as a *probe* and, in principle, this can result in a DP receiving more than one case feature, as demonstrated shortly below (15). Moreover, in a NOM/ACC system, $\downarrow \text{AGR} \downarrow$ always precedes $\uparrow \text{AGR} \uparrow$. Finally, in a nominative-accusative alignment, assignment of [+lr] in SpecvP must somehow be pre-empted, otherwise

the DP would receive ergative case. We assume that languages with nominative-accusative alignment have an *ergative switch-off parameter*, regulated by the following principle: In a NOM-ACC language the higher DP in a vP cannot be case-valued.³ Finally, we assume that the domain in which the proposed operations apply is the TP.

Let us apply the system to dative case assignment. In a double-object construction, a verb selects two objects, yielding thereby a VP with two unmarked DPs in a c-command relationship. Since this is a NOM-ACC system, $\downarrow \text{AGR} \downarrow$ will always precede $\uparrow \text{AGR} \uparrow$. Thus when $\downarrow \text{AGR} \downarrow$ applies, the higher of the two DPs receives a [+lr] feature from the lower one. Consequently, $\uparrow \text{AGR} \uparrow$ does not apply because the potential goal is already case-valued.

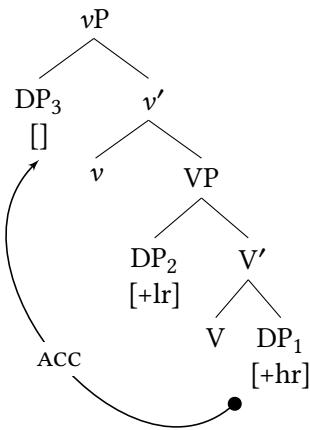
(13) Assignment of [+lr] in VP



After the external DP₃ is introduced in SpecvP, we now have three DPs in the same domain. The remaining two caseless DPs are DP₁ and DP₃. When $\downarrow \text{AGR} \downarrow$ applies between the highest DP₃ in the SpecvP and the lowest DP₁, no case valuation obtains, due to the ergative switch-off parameter, which demands that a DP in SpecvP cannot be case valued. $\uparrow \text{AGR} \uparrow$ thus applies afterwards, whereby the lower DP receives the [+hr] feature from the higher one (14).

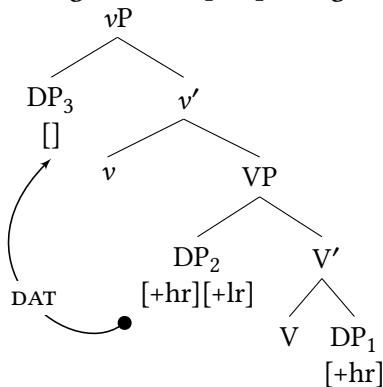
(14) Assignment of [+hr] to the lower argument in VP

³ Alternatively, assuming that at the vP level $\uparrow \text{AGR} \uparrow$ precedes $\downarrow \text{AGR} \downarrow$ yields the same results.



However, DP₂ and DP₃ still fulfil the criteria for case assignment to apply, since they are in a c-command relationship, and the higher one is not marked for case (15). Thus ↑AGR↑ applies, providing the lower DP₂ with a [+hr] feature (and the [+hr], [+lr] bundle is realised as dative).

(15) Assignment of [+hr] to higher argument in VP



This implementation derives the assignment of dependent case by means of existing, independently motivated mechanisms, in a derivational manner. An interesting prediction is that at the point in the derivation before the external argument is merged, dative should behave in a similar way as ergative case, as it only bears a [+lr] feature, as in (13). While we leave this point for further research, note that similarities between datives and ergatives have been reported in Basque by arreginevins12, in Indo-Aryan languages by butt06 and even Serbo-Croatian by

progovac13. Another important prediction is that movement of the DO should not affect ACC case assignment, since [+hr] feature still has the necessary configuration even after movement, as shown by (16). In this process, DP₂ is first assigned the [+lr] feature by ↓AGR↓ with DP₁, which is then moved, and still caseless. After DP₃ has been introduced, both DP₁ and DP₂ will receive their missing [+hr] features by ↑AGR↑ with it.

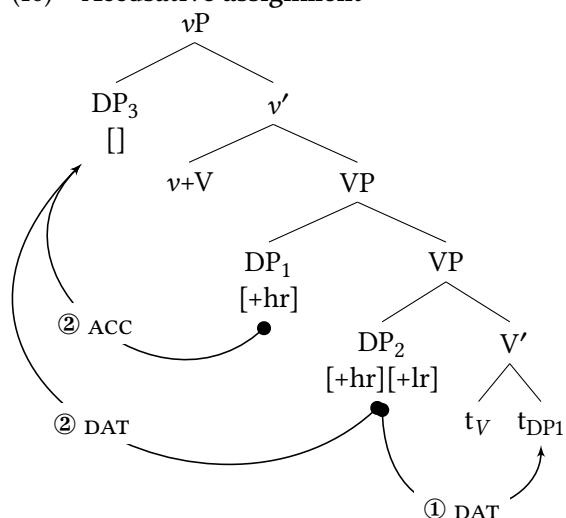
4 Lexical dative

4.1 Similarities between structural and lexical dative

As noted in the introduction, the central claim of this paper is that lexical dative case is assigned just like the structural dative. In order to support this claim, we first demonstrate that there are indeed similarities between ‘structural’ and ‘lexical’ datives in their syntactic behaviour.

For instance, they act in a similar way in passivisation. In double-object constructions, only the accusative object can be passivised, i.e. only the theme argument can alternate between accusative and nominative, as in (17).

(16) Accusative assignment



- (17) a. Ljubica je dala Milošu knjigu.
 Ljubica.NOM.SG.F is gave.SG.F Miloš.DAT book.ACC
 'Ljubica gave a book to Miloš.'
- b. Knjiga je bila data Milošu.
 book.NOM.SG.F is been.SG.F given.SG.F Miloš.DAT
 'The book was given to Miloš.'
- c. Milošu je bila data knjiga.
 Miloš.DAT is been.SG.F given.SG.F book.NOM.SG.F
 'The book was given to Miloš.'

The dative argument, however, cannot be turned into a subject and it never alternates (18).

- (18) a. *Miloš je bio dat knjigu.
 Miloš.NOM is been.SG.M given.SG.M book.ACC
 'Miloš was given a book.'
- b. *Milošu je {bio / bilo} {dat / dato}
 Miloš.DAT is been.SG.M been.SG.N given.SG.M given.SG.N
 knjiga.
 book.NOM
 'Miloš was given a book.'

Unlike in Icelandic (as described by zaenenetal85), dative cannot bind a subject oriented anaphor (19a) and it cannot be deleted under subject ellipsis (19b), hence it is not a subject.

- (19) a. *Milošu je bila data svoja knjiga.
 Miloš.DAT is been.SG.F given.SG.F POSS.SG.F.NOM book.NOM
 Intended: 'Miloš was given his book.'
- b. *Miloš je bio izbačen sa časa i __
 Miloš.NOM is been.SG.M thrown.out.SG.M from class and
 bio je dat ukor.
 been.SG.M is given.SG.M reprimand
 intended: 'Miloš was thrown out of the class and he was
 reprimanded.'

Parallel to (17) above, some constructions with lexical datives can be pasivised, as in (20), where the lexical dative in (20b) mirrors the structural one from (17c).

- (20) a. Ljubica je pomogla Ani.
 Ljubica.NOM is helped Ana.DAT
 ‘Ljubica helped Ana.’
- b. Ani je bilo pomognuto.
 Ana.DAT is been.SG.N helped.SG.N
 ‘Ana was helped.’

However, **zaenenetal85** subjecthood tests also show that this dative does not behave like a subject. It does not bind a subject-oriented anaphor (21a) and it cannot be deleted under subject ellipsis (21b), just like the structural dative in (19).

- (21) a. * Ani je bilo pomognuto od strane svoje sestre.
 Ana.DAT is been helped.SG.N from side POSS.GEN sister.GEN
 ‘Ana was helped by her sister.’
- b. * Ana je uradila sve zadatke i pri tome je bilo
 Ana.NOM is done.SG.F all tasks.ACC and with that is been.SG.N
 pomognuto.
 helped.SG.N
 ‘Ana did all the tasks and was helped with that.’

Moreover, as argued by **maling01** and shown for German by **mcfadden04**, one of the structural asymmetries between DOs and IOs is their behaviour in nominalisations. DOs appear in genitive when the VP is nominalised (22b), unlike both structural (22c) and lexical datives (23), which do not alternate with genitive.⁴

(22) Structural dative

- a. Ljubica je poklonila Milošu knjigu.
 Ljubica.NOM is gave Miloš.DAT book.ACC
 ‘Ljubica gave a book to Miloš.’
- b. poklanjanje knjige Milošu
 giving book.GEN Miloš.DAT
 ‘the giving of the book to Miloš’
- c. poklanjanje Miloša
 giving Miloš.GEN
 i. ‘the giving of Miloš (to someone)’

⁴ A reviewer wonders about the status of *darivanje Miloša* ‘the giving of something to Miloš.GEN’ in (22c). We believe that here the genitive of the complement of *darivati* is lexical. We leave it to future research to explore how lexical genitive fits into the current proposal.

ii. * ‘the giving (of something) to Miloš’

(23) Lexical dative

- a. Ova kapa pripada Ani.
this.NOM cap.NOM belongs Ana.DAT
‘This cap belongs to Ana.’
- b. pripadanje Ani
belonging Ana.DAT
‘the belonging (of something) to Ana’
- c. pripadanje Ane
belonging Ana.GEN
 - i. ‘the belonging of Ana (to someone)’
 - ii. * ‘the belonging to Ana’

Finally, as argued for German by sternefeld85; bayeretal01; mcfadden04, in the so-called ‘topic drop’ constructions, it is possible to omit the ACC (25a), but not a DAT topic, irrespective of whether it is structural (25b) or lexical (25c).

- (24) Da li poznaćeš Tamaru?
that PRT know.2.SG Tamara.ACC
‘Do you know Tamara?’

- (25) a. Da, poznajem (je).
yes know.1.SG her.ACC
‘Yes, I know her.’
- b. Da, jednom sam *(joj) poklonila cvet.
yes once am her.DAT gave flower
‘Yes, I once gave her a flower.’ structural DAT
- c. Da, jednom sam *(joj) pomogla.
yes once am her.DAT helped
‘Yes, I helped her once.’ lexical DAT

From these similarities, we conclude that lexical and structural datives can be treated as the same type of syntactic objects.⁵ In the next sections, we will inspect different types of lexical datives we have identified in Serbian in turn.

⁵An additional language specific test that points into the same direction is Left Branch Extraction, which is allowed out of subjects (i.a) and objects (i.b) in Serbian (see bosk2005, and subsequent work), but seems to be disallowed both with structural (i.c) and lexical dative (i.d).

4.2 Lexical dative as dependent case

4.2.1 *Help-type* verbs as underlying ditransitives

Help-type verbs include verbs such as *pomoći* ‘help’, *čestitati* ‘congratulate’, *ugoditi* ‘please’, *služiti* ‘serve’, *verovati* ‘believe’, *zavideti* ‘envy’, *doprinjeti* ‘contribute’, etc. (a partial list from several types of monotransitive constructions identified by Stipčević). We argue that these verbs are underlyingly ditransitive, where the DP_{ACC} is present, but covert, yet even as such, it serves as a competitor for dative case assignment. In these constructions, the NOM argument is usually an AGENT, while the DAT can have BENEFICIARY/MALEFICIARY/RECIPIENT/GOAL/TARGET PERSON theta-role. The unmarked word order of arguments of *help*-type verbs is NOM > DAT (26).

- (26) a. Ljubica je pomogla svom detetu.
Ljubica.NOM is helped POSS.DAT child.DAT
'Ljubica helped her child.'

b. Trener je čestitao svojim igračima.
coach.NOM is congratulated POSS.DAT players.DAT
'The coach congratulated his players.'

A possibly crucial piece of evidence for postulating a silent DP_{ACC} is that even though usually monotransitive, these constructions can have another *overt ACC* argument:⁶

- (i) a. Kakvi su mu juče [t dečaci] kupili poklon?
 what.NOM are him.DAT yesterday boys.NOM bought present.ACC
 ‘What boys bought a present for him yesterday?’ LBE with NOM

b. Kakav su mu dečaci juče kupili [t poklon]?
 what.ACC are him.DAT boys.NOM yesterday bought present.ACC
 ‘What present did the boys buy for him yesterday?’ LBE with ACC

c. *?Kojoj su dečaci juče [t drugarici] kupili poklon?
 what.DAT are boys.NOM yesterday friend.DAT bought present.ACC
 ‘Which friend did the boys buy the present for?’ LBE with DAT_{struc}

d. *?Kojoj su dečaci juče [t drugarici] pomogli?
 which.DAT are boys.NOM yesterday friend.DAT helped
 ‘Which friend did tie boys help yesterday?’ LBE with DAT_{lex}

However, the acceptability of the examples varies across different speakers, and it can be also influenced by factors such as word order. We leave this very interesting issue for future research.

⁶Note a similar kind of behaviour of lexical datives in German invoked by (mcfadden04). He

- (27) a. Ljubica je pomogla svom detetu školovanje.
Ljubica.NOM is helped POSS.DAT child.DAT education.ACC
'Ljubica sponsored her child's education.'
- b. Trener je čestitao svojim igračima pobedu.
coach.NOM is congratulated POSS.DAT players.DAT victory.ACC
'The coach congratulated his players on the victory.'

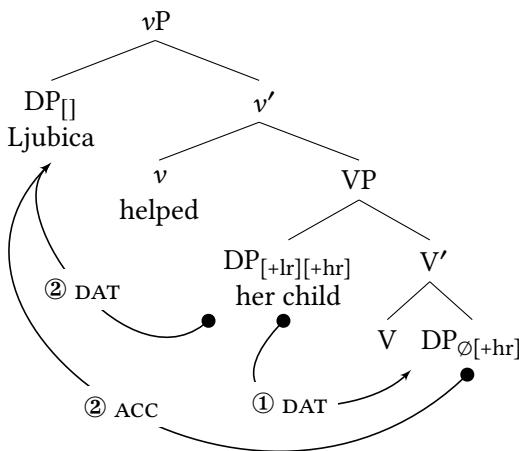
Help-type constructions with lexical datives in Serbian seem to be able to passivise (forming an impersonal passive construction; recall (20)). Such evidence suggests that constructions of this type can be treated as double-object constructions, equivalent to those in (7), allowing for treatment of lexical dative as structural.

We therefore argue that constructions with the *help*-type verbs are in fact double-object constructions. The lower ACC object is present as a silent DP (see wood2016 for a similar proposal for lexical accusatives in Icelandic and bakerbobaljik for similar ideas for ergative case). This silent DP can sometimes be realised overtly, as in (27) above. The 'lexical' dative is assigned in the same manner as in ditransitive double-object constructions. The feature [+lr] is assigned to the higher DP at the VP level via $\downarrow AGR \downarrow$. The assignment of [+hr] applies at vP, by $\uparrow AGR \uparrow$, which is established with the nominative DP in SpecvP.

(28) Lexical dative, *help*-type verbs

takes this as a piece of evidence that lexical dative assigned by *glauben/helfen*-type verbs in German can be analysed as structural dative.

- (i) a. Er glaubt seinem Bruder.
he.NOM believes POSS.DAT brother.DAT
'He believes his brother.'
- b. Er glaubt seinem Bruder die Geschichte.
he.NOM believes POSS.DAT brother.DAT the story.ACC
'He believes his brother's story.'



These constructions are therefore underlyingly true ditransitives, which explains their striking similarities to regular canonical ditransitive constructions and the similarities in the syntactic behaviour between the datives in the two.

4.2.2 An extension: *Adjust*-type verbs as underlying ditransitives

Another type of verbs identified by Stipčević select for dative objects where the dative argument mostly has a TARGET PERSON/GOAL theta-role. Some of the verbs include: *odužiti se* ‘pay back’, *osvetiti se* ‘take revenge’, *suprotstaviti se* ‘confront’, *predati se* ‘give in/give up’, *oteti se* ‘escape’, *priklučiti se* ‘join’, *prilagoditi se* ‘adjust’, etc. Most of these verbs contain the morpheme *se*, which mostly has a reflexive interpretation. The nominative argument is usually an AGENT in these sentences and the unmarked order is NOM > DAT (29).

- (29) a. Tamara se prilagodila situaciji.
 Tamara.NOM REFL adjusted.SG.F situation.DAT
 ‘Tamara adjusted to the situation.’
- b. Srdjan se predao policiji.
 Srdjan.NOM REFL surrendered.SG.M police.DAT
 ‘Srdjan surrendered to the police.’

Another overt ACC argument can be added, but in that case the morpheme *se* cannot appear in the sentence. Comparing (29a)/(29b) with (30a)/(30b) respectively, we can see that *se* and ACC seem to be in complementary distribution. *Se* therefore seems to absorb ACC case (see also Franks 1995).⁷

⁷ Passivisation is unfortunately inconclusive as a test. Sentences with an overt accusative can

- (30) a. Tamara je (*se) prilagodila ponašanje situaciji.
Tamara.NOM is REFL adjusted.SG.F behaviour.ACC situation.DAT
'Tamara adjusted her behaviour to the situation.'
- b. Srdjan je (*se) predao dokumente policiji.
Srdjan.NOM is REFL submitted.SG.M documents.ACC police.DAT
'Srdjan submitted the documents to the police.'

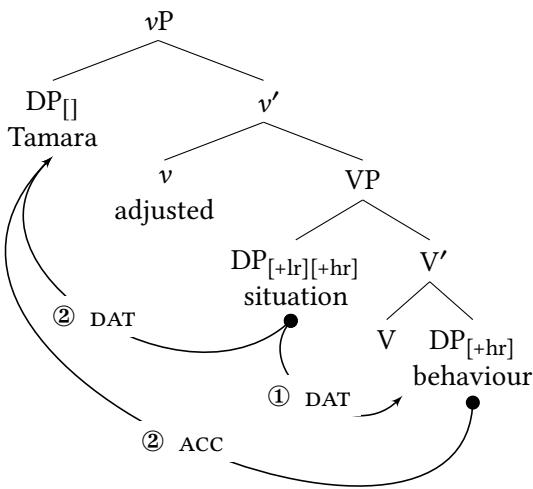
The similarities between (30) and (29) above can be captured by the derivations in (31) and (32). While verbs with 'structural' dative contain an overt DP as a DO, *adjust*-type verbs contain a silent DP. Crucially, the [+lr] feature is assigned to the higher of the two DPs in the VP. While in (31) the lower DP receives the [+hr] feature and thereby ACC case upon merging the external argument, in (32), the lower DP argument in the VP is reduced (or alternatively it starts out as a null DP) and becomes realised by *se*.

(31) Structural dative (30)

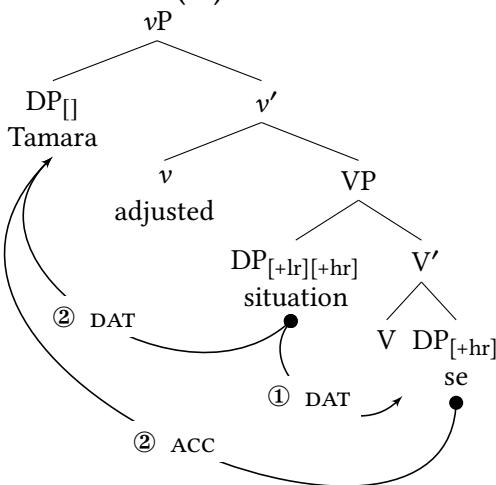
be passivized regularly (i.a), but the ones without the overt ACC argument and with the *se* morpheme cannot be (i.b).

- (i) a. Ponašanje je bilo prilagodjeno situaciji.
behaviour.NOM.SG.N is been adjusted.SG.N situation.DAT
'The behaviour was adjusted to the situation.'
- b. * Situaciji se / je bilo prilagodjeno.
situation.DAT REFL is been.SG.N adjusted.SG.N
intended: 'One adjusted to the situation.'
- c. Situaciji se prilagodilo.
situation.DAT REFL adjusted.SG.N
'One adjusted to the situation.'

As (i.c) shows, the only possible 'passive' form with these constructions is actually impersonal middle construction, which is expected if these constructions even in the active voice already involve argument reduction (see *progovac13; marelj04*).



(32) Lexical dative (29)

4.2.3 *Belong*-type verbs as unaccusative ditransitives

Belong-type verbs include verbs such as *pripadati* ‘belong’, *zapasti* ‘get into/end up with’, *nedostajati* ‘miss’, etc. (see also *stipcevic*). We argue that these verbs are underlyingly ditransitive as well, but they do not take an external argument and are, therefore, unaccusative. The NOM argument is usually a THEME, while

DAT is usually interpreted as POSSESSOR. The unmarked word order is NOM > DAT, as illustrated by (33).

- (33) Ova kapa pripada Ani.
 this.NOM cap.NOM belongs Ana.DAT
 ‘This cap belongs to Ana.’

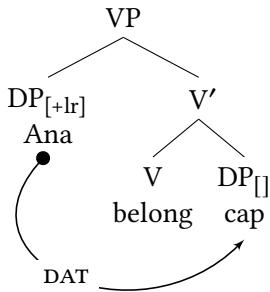
No additional overt accusative arguments can be added to these verbs and a structure like this cannot be passivised (34). The impossibility of passivization, the lack of overt accusative argument and the theme interpretation of the NOM argument suggest therefore that such constructions are essentially unaccusative. The idea that the NOM argument is introduced as the internal argument of the verb, which is later moved to the sentence-initial position, can be supported by evidence from quantifier scope. In (1), the possibility for the existential quantifier to outscope the universal one indicates that the NOM argument has been moved and is able to reconstruct in its base position.⁸

- (34) * Ani je bilo pripadano.
 Ana.DAT is been.SG.N belonged.DAT
 *‘It was belonged to Ana.’
- (35) [ACC Svaka kapa] pripada [_{DAT} jednoj devojci].
 every.NOM cap.NOM belongs one.DAT girl.DAT
 ‘Every cap belongs to one girl.’ $\exists > \forall, \forall > \exists$

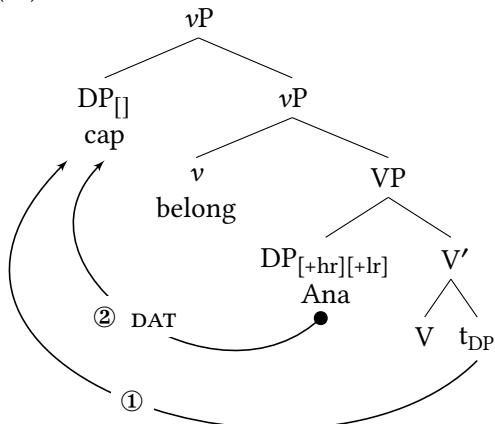
In order to derive this type of lexical dative as dependent case, we assume that the two internal arguments of these verbs are both merged as the arguments of V, as in (36). In this configuration, $\downarrow AGR \downarrow$ applies first and the higher DP receives the [+lr] feature from the lower one. The lower DP does not receive any case features at the VP level. Since these verbs are unaccusative, no external argument is merged in SpecvP. However, the THEME argument must move up in order to become the (derived) subject of the sentence. In order to move to SpecTP, it has to move through the vP phase edge (*legate03*). At the vP edge, this DP can now serve as a case competitor again. After $\downarrow AGR \downarrow$ fails due to the ergative switch-off parameter that precludes case valuation in SpecvP, $\uparrow AGR \uparrow$ succeeds, and [+hr] is assigned to the DAT DP (37).

⁸This situation mirrors the one in (8b). Note that since Serbian is a rigid scope language, only movement can affect quantifier scope, thus the reading here cannot be derived by quantifier raising of the existential quantifier and must instead involve movement (see antonyk15).

(36) Lexical dative at VP



(37) Lexical dative at vP



In conclusion, treating these constructions as unaccusatives correctly captures the fact that they cannot passivize and that the DP_{NOM} is interpreted as a THEME rather than AGENT, thereby enabling a unified treatment of lexical and structural dative as dependent case.

4.3 An extension: (*feel*)-like-type verbs as unaccusative ditransitives

(*Feel*)-like-type verbs select for an EXPERIENCER-type dative argument, as in (37). The unmarked word order seems to be DAT > NOM.

- (38) Ani se svidja zelena haljina.
 Ana.DAT se appeals green.NOM dress.NOM
 ‘Ana likes the green dress.’

As with the previous group, no additional overt accusative arguments can be added to this structure. Moreover, a structure like this cannot be passivised (38).

- (39) *Ani je bilo svijđano.
Ana.DAT is been appealed.SG.N
'It was appealed to Ana.'

The lack of passivization possibility and the overt accusative argument, together with the theme interpretation of the NOM argument suggest that this could be an unaccusative construction. The *se* clitic, however, does not have a reflexive interpretation, but following *progovac13*, it can be assumed to be an expletive object pronoun. Based on the fact that these verbs cannot assign accusative and that the DP_{NOM} is ambiguous between subject and object interpretation, *progovac13* argues that the structures like these are in fact instances of an ergative-absolutive pattern in a language like Serbian. Such sentences would be analysed as in (36) and (37) above. The [+lr] feature is assigned to the higher DP at the VP level via ↓AGR↓, while the [+hr] feature is assigned at the vP level via ↑AGR↑. We leave the exact nature of the clitic *se* in these constructions for future research, which should be able to tell whether it is an additional silent argument that absorbs certain case features, or whether it is an expletive.

5 Conclusion

Dependent case assignment can be formalised by means of a derivational approach, where case features are assigned incrementally, via an Agree operation which holds between two DPs. DAT is assigned as high dependent case in the VP, while ACC is the low dependent case in the vP. We have seen evidence from Serbian that the account of structural DAT can be extended to cover the assignment of lexical DAT. Lexical dative is thus assigned in the same configurations: (i) in a ditransitive double-object construction with a silent DP as DO and a case competitor, (ii) in a double object construction involving an unaccusative verb. In its strictest form therefore, the Dependent Case Theory can capture assignment of both lexical and structural dative case as dependent case.

Abbreviations

1	first person	F	feminine
2	second person	GEN	genitive
↓AGR↓	Downward Agree	M	masculine
↑AGR↑	Upward Agree	N	neuter
[+hr]	lower role	NOM	nominative
[+lr]	higher role	PL	plural
ABS	absolutive	POSS	possessive
ACC	accusative	PRT	particle
DAT	dative	REFL	reflexive
ERG	ergative	SG	singular

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Chapter 17

Transitivity Requirement revisited: Evidence from first language acquisition

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The paper investigates null objects in early child grammar in light of the Transitivity Requirement approach (Cummins-Roberge2005), which states that transitivity is not dependent on the lexical features of the verb but is a universal grammatical property. I review naturalistic and experimental child data from sixteen typologically different languages (including five Slavic representatives) and show that the predictions of the Transitivity Requirement approach are not borne out. Instead, the results suggest that early object omissions reflect the presence of (optional) object drop in the target grammar. Children seem to omit objects only if the target grammar allows for this option, as it is the case, for example, in Russian, Ukrainian and Polish.

Keywords: null objects, child grammar, Transitivity Requirement, Slavic, crosslinguistic data

1 Introduction and preliminaries

While the study of null subjects in Slavic has received much attention (Franks 1995, Lindseth 1998, Fehrmann-Junghanns2008, Müller2006, among others), null / missing / implicit direct objects still constitute an under-researched area and the distribution of object drop is still not uniformly capturable. Object drop has not been used extensively as a way to classify languages in a typology. In other words, whereas it is common to talk about pro-drop or null subject languages, references to “object drop languages” or “null object languages” are much less frequent in the literature. One important reason for this classificatory asymmetry is that object drop appears to be much more variable than subject drop. Most

attempts to identify a common denominator for null objects have failed in cross-linguistic terms. Possible restrictions on object drop have been discussed previously, such as, for instance, overt morphological verb-object agreement, which holds for Swahili or Georgian but not for Russian or Chinese; topic drop, holding for German but not for other null-object languages; as well as other conditions like specific structural contexts favouring the appearance of null objects (e.g. sequence of verbs or imperatives). Generally, it is assumed that null objects are a licit option in the grammars of Russian, Polish, to some extent German, European and Brazilian Portuguese, and Chinese, among other languages. Languages such as Bulgarian, Serbo-Croatian or Spanish, on the other hand, disallow null objects.

In this paper, I examine the omission of referential, definite objects as in (1), a type that happens to be ungrammatical in English (1a), but grammatical in other languages, such as Russian (1b). What I leave aside are non-referential null objects, illustrated by (2). For a discussion of the licensing of object drop of indefinite DPs in European Spanish, Modern Greek, and Bulgarian see Campos (1986), Giannakidou-Merchant1997, and Dimitriadis (1994). See also dvorak17 for a recent in-depth discussion of indefinite and generic null objects in Czech. For the sake of terminological clarity, I use NULL OBJECTS to refer to the phonological non-realisation of direct objects in transitive contexts, as in (1). (Other common terms include “object omission” or “object drop”.)

(1) **Referential/Definite null object**

- a. A: What did you do with the newspaper?
B: * I read Ø.
- b. A: Čto ty delaeš s étim rasteniem? (Russian)
what you.NOM do.1SG with this plant.INS
'What are you doing with this plant?'
- B: Polivaju Ø. / Ja polivaju ego.
water.1SG I water.1SG it
'I'm watering it.'

(2) **Non-referential/Indefinite null object**

- A: What are you going to do while you wait?
- B: I'll buy a newspaper and I'll read Ø.

Object realization or omission have both a syntactic component (what kinds of mechanisms govern the licensing and recoverability of null objects) and a

lexical component (what types of verbs allow optional realization of their direct object argument). In this paper, I concentrate on a syntactic approach to transitivity, based on the so-called TRANSITIVITY REQUIREMENT (TR) proposed by Cummins-Roberge2005. In parallel to the EXTENDED PROJECTION PRINCIPLE (EPP) for subjects, it suggests that the direct-object position is given by Universal Grammar and is not dependent on the lexical features of the verb. The syntactic analysis of null objects is particularly appealing as it provides very concrete and testable predictions about transitivity development in first language acquisition. Under the TR, null objects are predicted to be a part of the default initial setting for acquisition purposes. This view is advocated in Perez-Leroux-etal2008, who suggest that children start out with a null cognate object default, and that the initial referential properties of this null cognate object are broader than in the target grammar.¹ Experience serves to block, or narrow down, the referential semantics of the null default. It follows from this that we should be able to find evidence of object omissions in the early stages of language development in typologically different languages, irrespective of the availability of null objects in the target grammar.

The main agenda of this paper is to evaluate the empirical validity of the TR by examining acquisition data from sixteen typologically different languages, including five Slavic representatives; see Table 1 and Table 2. I review the results from studies carried out on these languages with the aim to examine the object (non)omission in the early stages of grammar, especially in light of the TR. Such a secondary approach to primary data is justified since as more research on a given topic within a particular language family emerges, it is valuable to have research that consolidates the studies and elucidates similarities and differences across language families. The Slavic perspective is particularly interesting since Slavic languages vary with respect to the availability of object drop although they share a number of common morphosyntactic features. Additionally, language acquisition in Slavic is still under-researched compared to other languages, and this paper aims to contribute to the cross-linguistic investigation of the early development of objects by presenting and reviewing child data from Slavic.

The paper is organised as follows. §2 sketches some theoretical approaches

¹Since different languages have different conditions as to where objects are allowed to remain unpronounced, Perez-Leroux-etal2008's (Perez-Leroux-etal2008) approach is to seek for a common denominator in null object constructions. On the basis of French and English data, they identify a null bare N object to be the common denominator in English and French. The authors suggest that by postulating this common denominator as the minimal default, they can make inferences about what development is required to attain the proper distribution and features of null objects in a given target.

to object omission, focusing on the discussion of the syntactic transitivity approach by Cummins-Roberge2005 and outlining the predictions of this analysis for the acquisition of objects, with respect to the object omissions children are predicted to show. In §3, I discuss experimental and naturalistic child data from Russian, Serbo-Croatian, Bulgarian, Polish, Ukrainian, French, English, Spanish, Catalan, Italian, European Portuguese, Brazilian Portuguese, Romanian, Standard Modern Greek, Cypriot Greek, and Chinese. The participants in the studies are typically-developing monolingual children with the core age 2–4 years, as well as 4–6 years for some languages (for the detailed data description and methodology, see §3.1). The survey of the data shows that the predictions made by the TR are not borne out, and null objects are not a default setting in the early stages of grammar. Based on the empirical findings, I suggest that there is a strong link between children’s object omissions and the grammaticality of null objects in the target grammar. This view is compatible with the proposal made in Varlokosta-etal2016, suggesting that children generally opt for the weakest alternative on the scale pronoun > clitic > null, depending on what is available in their language. Of course, this proposal needs further investigation in studies that test *different* types of objects, i.e. full pronouns, clitics and full DPs.

2 The Transitivity Requirement and its predictions for child grammar

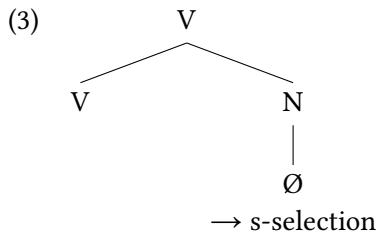
To start off, I briefly sketch the lexically and syntactically motivated approaches to argument structure, with special emphasis on the syntactic transitivity approach by Cummins-Roberge2005 and its prediction for the development of (direct) objects in the early stages of grammar.

Verbs are flexible as to which and how many argument positions they project (VanHout2012). According to the lexical approach, the verb’s flexibility is incorporated into its lexical representation, i.e. the verb is lexically represented with more than one representation, each of which is linked to a certain verb subcategorization frame (Chomsky 1965; Emonds 1991). In the case of English generic null objects, Rizzi (1986) assumes that theta roles can be fully saturated in the lexicon. Other, discourse-motivated approaches, such as Groefsema (1995) and Fellbaum-Kegl1989, associate the use of certain null objects such as generic (non-referential) null objects, cf. (2), with discourse factors and pragmatic considerations.

An alternative analysis is provided by the modular account relying on a strictly syntactic approach to the occurrence of null objects. The Transitivity Require-

ment (TR) by Cummins-Roberge2005, parallel to the Extended Projection Principle (EPP) for subjects, suggests that the direct-object position is given by Universal Grammar and is not dependent on the lexical features of the verb. Thus, the direct-object position is not seen as a characteristic depending on the lexical-semantic features of the verb, but rather as an integral, essential element of the predicate. Under the TR, transitivity is viewed as a universal grammatical property. Null objects are structurally present, and all VPs (i.e. with transitive, unergative, unaccusative verbs, etc.), contain an object position that can be overtly expressed or not (Cummins-Roberge2005). When an object is not phonologically realized, it remains as a null object in the VP.

Under the TR, (3) is considered to be a universal structural template for objects (Cummins-Roberge2005; Perez-Leroux-etal2008). This template is shown in the tree below, where N is an implicit null object.



The main premises of the TR-based approach, namely that (i) transitivity is a universal grammatical property and (ii) null objects are by default structurally represented in all languages, provide a fruitful ground for making precise predictions about the initial states of human grammar. If null objects are present by default, we should expect children to go through a stage of object optionality (cf. Perez-Leroux-etal2008), irrespective of the object-drop capacity of the specific target grammars. An overgeneralization of the free availability of null objects due to a failure to restrict the null structure to the appropriate context is predicted. Omissions should therefore be found in typologically different languages, irrespective of the availability of null objects in the target grammar and without reference to the pronominal system of the specific language. For example, objects are expected to be dropped in the early development of languages with and without clitic systems (such as Bulgarian and English, for example). Such a prediction is particularly challenging since clitic pronouns are generally prohibited from dropping. The emerging research question, namely whether children of all languages go through a null object stage, is addressed in the next section, presenting empirical data from sixteen languages.

3 Null objects in child grammar

In order to test the validity of the predictions made by the TR, I turn to the examination of how children acquiring various languages deal with direct objects in the acquisition process. The comparison of developmental patterns in typologically different languages such as Russian, Greek, French, and Chinese, to name only a few, allows to make hypotheses about universally represented structures at the starting point of linguistic development and about grammatical elements that are specific to particular languages. More importantly, a comprehensive survey of studies conducted on the acquisition of objects in different languages, which summarizes and compares the derived results, can test the predictions made by the TR that children of *all* languages go through a null object stage.

3.1 Data

I review data from experimental studies (see Tables 1 and 2), concerned with both the production and comprehension of direct objects in elicited and naturalistic environments. The data stem from the studies on sixteen typologically different languages. The focus of the present paper is on the five Slavic representatives: Russian, Serbo-Croatian, Bulgarian, Polish and Ukrainian, but the data are also placed in a cross-linguistic context by comparing the five Slavic languages to eleven other languages, for which object drop has been studied, namely French,

Table 1: Reviewed studies on the acquisition of objects
(Slavic languages)

Language	Studies	Type of data	Age
Russian	Gordishevsky-Avrutin 2004	spontaneous	1;9–2;6
	Frolova; Frolova (2016)	elicited	2;10–6;1
Serbo-Croatian	Stiasny (2003; 2006)	elicited and spontaneous	1;10–4;7
Bulgarian	Radeva-Bork (2013; 2015)	elicited	2;2–4;3
Polish	Tryzna (2015)	spontaneous elicited comprehension and production	2;1–2;9 2;4–5;10
Polish & Ukrainian	Mykhaylyk-Sopata 2016	elicited	3;0–6;0

Table 2: Reviewed studies on the acquisition of objects
(non-Slavic languages)

Language	Studies	Type of data	Age
French	Hamann-etal1996; Jakubowicz-Rigaut2000; Perez-Leroux-etal2008	elicited and spontaneous	2;0–6;0
	Grüter (2006)	comprehension	
English	Bloom (1990)	spontaneous	2;0–3;0
	Grüter (2006)	elicited comprehension	2;0–6;0
	Perez-Leroux-etal2008	elicited	2;9–5;11
Spanish	Wexler-etal2004; Castilla-etal2008; Stiasny (2006)	elicited and spontaneous	2;0–5;0
	Mateu (2015)	comprehension	2;0–4;0
Catalan	Wexler-etal2004	elicited	2;0–4;0
Italian	Cardinaletti-Starke2000; Guasti (1993); Schaeffer (2000); Tedeschi (2009)	elicited and spontaneous	2;0–5;0
European Portuguese	Costa-Lobo2007a; Costa-Lobo2007b; Carmona-Silva2007 Silva2010	elicited	3;0–6;6
Brazilian Portuguese	Lopes (2008; 2009)	spontaneous	1;8–3;7
Romanian	Babyonyshев-Marin2006	elicited and spontaneous	2;0–3;10
Standard modern Greek	Stephany (1997); Marinis (2000)	spontaneous	1;9–2;9
	Tsakali-Wexler2003	elicited	1;9–2;9
Cypriot Greek	Grohmann-etal2010; Petinou-Terzi2002; Neokleous (2011)	elicited and spontaneous	3;0–5;11
Chinese	Wang-etal1992	elicited	3;0–4;0

English, Spanish, Catalan, Italian, European Portuguese, Brazilian Portuguese, Romanian, Standard Modern Greek, Cypriot Greek, and Chinese. Tables 1 and 2 give an overview of the languages and the conducted studies, including information about the type of data, i.e. elicited or/and spontaneous, as well as about the ages of tested children.² For French, English, Spanish, and Italian, there is a greater number of studies than for other languages, so only a selection of the most recent and representative studies could be included here.

The overview of studies shows that the acquisition of objects has been well examined over the last three decades, with studies covering a vast number of languages and providing both spontaneous and elicited child data from production and comprehension, something which is rather rare in the assessment of acquisition of other grammatical phenomena. This is particularly beneficial for the present goals, since the TR-based approach predicts object drop in the early stages of language acquisition irrespectively of typological differences found in individual language systems.

Here, I analyse production and comprehension data from Polish, French, English, and Spanish. For Russian, Serbo-Croatian, Bulgarian, Ukrainian, Catalan, Italian, European Portuguese, Brazilian Portuguese, Romanian, Standard Modern Greek, Cypriot Greek, and Chinese, I deal with production data in elicited and spontaneous contexts. The core age of the participants in the studies lies between two to four years, with some languages (Russian, Polish, French, English, and European Portuguese) including older children, four to six year old, in some of the studies. In the majority of the studies participants are controlled for gender. The subjects are typically-developing, monolingual children, recruited from day cares or schools.

The comparison of results from the included studies is legitimate due to the use of a conform and highly comparable experimental methodology, which is described in the next paragraph. In fact, in a recent analysis of meta-megastudies, Myers (2016) shows that methodological differences across studies seem generally insufficient to explain large differences in results, and that what seems to have a bigger effect are typological differences between languages. Whereas a detailed discussion of methodological effects in object elicitation tasks is beyond the scope of this paper, I hold that it is legitimate to compare the results from the presently included studies mainly due to the use of a common elicitation procedure. However, see Varlokosta-etal2016, who argue for an effect of the used

²Ages are given in years and months, i.e. 1;9 indicates 1 year and 9 months of age.

elicitation methodology on the production of clitic objects in experimental tasks.

Studies on the acquisition of objects employ a standard elicited production task (Perez-Leroux-etal2008; Schaeffer 2000; Radeva-Bork 2012; among others) to examine how children use direct objects in transitive contexts of the kind found in (4), where (4a) is a licit option in the adult grammar of some languages, such as Russian or Polish, but not in others, such as Bulgarian or Serbo-Croatian. Examples (4b) and (4c) represent the grammatical choices for Bulgarian, making use of a full NP/pronoun or a clitic, respectively.

- (4) ‘What did the boy do?’

- a. * Toj ritna Ø.(Bulgarian)
he kicked
Intended: ‘He kicked it.’
- b. Toj ritna topkata / neja.
he kicked ball.F.DEF her.ACC
‘He kicked the ball.’ / ‘He kicked it.’
- c. Toj ja ritna.
he it.CL kicked
‘He kicked it.’

In such elicitation tasks, participants are shown simple act-outs with toys and props, or picture cards illustrating simple activities, such as kicking a ball, drawing a flower, or building a house. Every activity represents a transitive scenario with a subject and an object. The studies involve a big number of test items, usually between six and twelve. After the visual prompt, participants hear a control question of the kind *What did X do?* without the target object being mentioned. Depending on the specificities of the language, target answers contain a transitive structure with an overt object or with its omission, cf. (4). Transitive verbs such as *kick, draw, build, give, hug, drink, hit, push* etc. are elicited in the tasks. A screening prior to the study guarantees that the children understand the object nouns and the verbs denoting the actions in the tasks. An example of a model elicitation of a direct object is given in (5). The use of an overt object is obligatory here. Similar tasks have been used in the elicitation studies presented in Tables 1 and 2. For the spontaneous data, recordings and transcripts are used.

(5) Model elicitation of direct objects in Bulgarian

EXPERIMENTER 1:

'This is Maria. This here is her favourite doll. The doll's hair is so bushy.' (utterance accompanied by an act-out of the experimenter combing the doll)

EXPERIMENTER 2:

Kakvo napravi Maria?
what did Maria
'What did Maria do?'

CHILD 2;6:

Sresa kuklata.
combed doll.DEF
'She combed the doll.'

(adapted from *Radeva-Bork 2012: 79*)

3.2 Results

An analysis of the obtained results shows that there is a high degree of variation across languages when it comes to object omission in early grammars. Since it is impossible to give a detailed presentation of the results from the individual studies in this paper, I focus on the Slavic data (marked in bold in Table 3), and present the results from the other languages for the sake of cross-linguistic comparison.

Table 3: General results for the spread of object (non)omission.

Object omission	No object omission	Conflicting data
Russian	Bulgarian	French
Ukrainian	Serbo-Croatian	English
Polish	Spanish	
E. Portuguese	Modern Greek	
Br. Portuguese	Cypriot Greek	
Chinese	Romanian	
Italian		
Catalan		

Generally, we find evidence of object omission in Russian, Ukrainian, Polish, European Portuguese, Brazilian Portuguese, Chinese, Italian, and Catalan, but not in Bulgarian, Serbo-Croatian, Spanish, Modern Greek, Cypriot Greek, and

Romanian. Children in the latter group produce their obligatory objects in transitive contexts from the early stages of language development in a target-like manner. In contrast, Russian, Ukrainian, Polish, European Portuguese, Brazilian Portuguese, Chinese, Italian, and Catalan undergo a stage of object omission, in which obligatory transitive contexts do not yield an object in the early stages of first language acquisition. Regrettably, I had to put French and English aside, since the individual studies on each of these languages yielded contrasting results with respect to how much object omission was found in children. Table 3 summarizes the main results from the studies on the sixteen languages under analysis.

Let me discuss the results in more detail. Although results from individual studies on Spanish vary as to how much omission is found in the early stages, all of the studies support the view that Spanish objects are acquired early, around the age of two to three years. On the basis of the elicitation data from 28 children, Wexler-etal2004 show that two-year-olds literally never omit objects (omission is at 0%). These results are consistent with the spontaneous data provided in Stiasny (2006). In contrast to Spanish, for Catalan Wexler-etal2004 find high rates of object omission. Two-year-olds omit objects 74% of the time. The object omission remits as age progresses but does not disappear by the age of four years.

Italian patterns with Catalan with respect to object omission – the rate of object omission is high in both languages for ages two to four. Object omissions in Italian have been evidenced both in spontaneous speech (a.o. Guasti 1993) as well as in elicitation data (Schaeffer 2000). The two-year-olds in Schaeffer's study omit objects at high rates of up to 64%. Object omission at 15% is still present in the production of three-year-olds. These findings are confirmed by similar rates of object omission for the same ages in Tedeschi (2009). It is not before the age of four that Italian children cease omitting their objects and omissions fall to 0%. So whereas Spanish children produce overt objects from the early on, Italian children go through an initial phase of object omission (ending at around four years).

In an experimental study for Romanian, Babynshev-Marin2006 find that Romanian-speaking children “produce object clitics freely as soon as they are able to produce utterances that are long enough to contain them” (p. 31). The authors divide their population into groups according to MLU and not according to age.³ The results indicate object omission of 82% for children with MLU smaller than two, and omission of 13% for children with MLU greater than two. Since

³MLU refers to Mean Length of Utterance, a technique often used in L1 acquisition research to measure the complexity of a child's speech by calculating the number of words (or morphemes, on some approaches) per utterance.

Babyonyshov and Marin show that object omission in Romanian is due to production limitations (such as low MLU) instead of a grammatical constraint, we can conclude that the initial stage of language development in Romanian is not characterized by object omission.

When it comes to Slavic languages, Bulgarian and Serbo-Croatian pattern alike since the children in the studies did not omit objects (Radeva-Bork 2013; 2015; Stiasny 2006). No object omission or misplacement has been found in Serbo-Croatian in either elicited or naturalistic production (Stiasny 2006). The same holds for Bulgarian; objects do not get omitted and are used in a target-like manner already around the age of 2;3 on (Radeva-Bork 2015). If we compare Italian and Bulgarian, we see that Italian two-year-olds omit objects 64% of the time (Schaeffer 2000), whereas their Bulgarian peers omit objects only about 30%, so about half as much as in Italian. Null objects fully disappear in Bulgarian towards the end of year three, which is not the case in Italian. Therefore the study results clearly indicate the lack of object omission in the acquisition of Bulgarian. In contrast, in Polish, Ukrainian and Russian, null objects are the preferred option for children (Mykhaylyk-Sopata2016; Gordishevsky-Avrutin2004; Tryzna 2015; Frolova 2016). In Polish and Ukrainian, children prefer to use null arguments up to the age of five. At the age of three they omit objects at 89% in Polish and at 68% in Ukrainian (Mykhaylyk-Sopata2016). The onset of direct object use seems to be semantically affected since around the age of five, clitics/pronouns are used more often for animate referents, and it is only around the age of six that they start being used also for inanimate objects (Mykhaylyk-Sopata2016).

In Russian, Ukrainian, and Polish, children do not only omit direct objects in obligatory transitive contexts, but they overproduce the null option when compared to adults (in the contexts where NO is allowed). This holds particularly for Russian, where three- to six-year old children produce more null objects than adults in the contexts where object omission is a grammatical possibility. Object omission at around 80% was found for the age of three years (Frolova 2016). Even at the age of five, Russian children omit referential objects at 73% and non-referential ones at 54%. As Frolova shows, Russian children even omit direct objects in strongly transitive (perfective) contexts where adults tend to use overt nouns but where the null object is still grammatical. Generally, production of null objects in Russian is attested at a similar rate across all age groups up to the age of six, and it is higher than for adults (Frolova 2016). In non-referential contexts, a gradual decrease in object drop, an increase in lexical object (i.e., full DP object) use and a low production of pronouns is observed with the age progression. The rate of null objects is higher in referential contexts, where we

rarely find lexical objects while the percentage of pronouns is higher. Similarly to their Russian peers, children acquiring Polish overuse null objects in comparison with adults, and the omission rate decreases as language development progresses (Mykhaylyk-Sopata 2016; Tryzna 2015).

From a cross-linguistic perspective, European Portuguese, Brazilian Portuguese, Chinese, Italian, and Catalan pattern with Russian, Ukrainian, and Polish in terms of the attested object omission in the early stages (for ages two to four and above). Spanish, Modern Greek, Cypriot Greek, and Romanian behave like Bulgarian and Serbo-Croatian in that they are not characterized by object drop in the acquisition process, and objects are present already at the age of two. The latter finding is in contradiction with the predictions made by the Transitivity Requirement (see §2).

3.3 Discussion and implications

The data survey from sixteen typologically different languages (including five Slavic representatives: Bulgarian, Serbo-Croatian, Russian, Ukrainian, and Polish) challenges the obligatory structural presence of null objects postulated by the TR, and calls for re-evaluation of this theoretical analysis of the null object phenomenon in adult grammars. The prediction made by the Transitivity Requirement that children of *all* languages should go through a null-object stage is not borne out – out of the sixteen languages, eight allow object omission in early grammar, six languages do not, and two languages (French and English) show conflicting results. Therefore, there is no evidence that null objects are a default initial setting for acquisition purposes. Instead, there seems to be a clear division between languages with and without object drop already in the early stages.

How can the division between languages in terms of object (non)omission be accounted for? Based on the results presented in §3.2, a parallel between children's performance and the actual permission or prohibition of object drop in the target grammars emerges. Children omit objects only if their target grammar provides the null object option, which is the case for Russian, Ukrainian, Polish, European Portuguese, Brazilian Portuguese, Italian, Catalan, and Chinese. In contrast, Bulgarian, Serbo-Croatian, Spanish, Modern Greek, Cypriot Greek, and Romanian do not allow object drop, in the sense of example (1), and children seem to act according to the target grammar rules and produce objects from early on. Hence, early object omissions seem to reflect the presence of (optional) object drop in the target grammar. Children overgeneralize novel intransitives out of novel transitives and drop objects at higher rates than adults, provided that

their target grammar has that option. They seem to be faithful to the syntax of the input. This observation is generally supported by experimental evidence in the language acquisition literature, indicating strong input sensitivity in acquisition and target-like omissions in spontaneous data (Ingham 1993). In addition, the data discussed here supply support to the proposal in Varlokosta-etal2016 that children generally opt for the weakest alternative, in accordance with the scale pronoun > clitic > null, depending on what is available in their language.

Children seem to be faithful to the syntax of the input as their object drop reflects the presence of (optional) object drop in the target grammar and gives no evidence that null objects are a default setting for all languages. Furthermore, for the languages in which children omit objects, they seem to overgeneralize the null option. Data from Chinese as well as from European and Brazilian Portuguese confirm that children tend to overuse the option of object-dropping, licensed by their target grammar in some contexts, as late as at the age of five (Wang-etal1992, Costa-etal2012, Lopes 2009). In addition, it seems that if a null argument is available in the grammar, the discourse-pragmatic or semantic features of the direct object referent play an important role in argument realization. This is supported by studies showing a semantic effect on the use of direct objects, for example in Polish, where overt objects (clitics/pronouns) are used more often for animate referents around the age of five. Around the age of six, they are used for inanimate referents. It may be the case that null objects are different from null subjects in that semantic and discourse factors play a greater role in the presence and interpretation of the null object. This, however, needs further investigation.

4 Conclusion

The aim of this paper was to investigate object omission in early child grammar in light of the Transitivity Requirement (TR) approach (Cummins-Roberge2005), which states that transitivity is not dependent on the lexical features of the verb but is a universal grammatical property. Within this approach, null objects are predicted to be a default initial setting for language acquisition. If null objects are indeed default, we expect to find evidence for object drop in the early stage of development in various languages, irrespective of the (non)omission capacity of the specific target grammars.

The paper reviewed naturalistic and experimental child data from sixteen typologically different languages and showed that out of the sixteen languages, eight languages (Russian, Ukrainian, Polish, European Portuguese, Brazilian Por-

tuguese, Italian, Catalan and Chinese) allow object omission in early grammar, six languages (Bulgarian, Serbo-Croatian, Spanish, Modern Greek, Cypriot Greek, and Romanian) do not, and two (French and English) show conflicting results. The predictions of the TR approach are not borne out and the idea of null objects being a default setting in the early child grammar is invalidated. Instead, there is a clear division between languages with and without object drop in the early stages. In fact, the results from the studies suggest that early object omissions reflect the presence of (optional) object drop in the target grammar. In other words, children seem to omit objects only if their target grammar allows for this option, as it is the case, for example, in Russian, Ukrainian and Polish.

Abbreviations

1	first person	F	feminine
ACC	accusative	INS	instrumental
CL	clitic	NOM	nominative
DEF	definite	SG	singular

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Chapter 18

Number agreement mismatches in Russian numeral phrases

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This paper looks at two cases of number agreement mismatch in Russian numeral phrases and offers a unified syntactic analysis for both. One case relates to examples where a higher numeral that typically selects a plural NP fails to do so when the head noun lacks a singular lexical form. Instead, an NP headed by a noun that lacks a plural lexical form is chosen despite the selectional requirement of the numeral. The second case concerns data discussed in Franks-House1982 that involve topicalization of a complement of a lower numeral, which consistently selects a singular NP, with the topicalized NP unexpectedly appearing in the plural form.

Keywords: Russian numeral phrases, number agreement, syntax, morphology, contrastive topicalization, information structure

1 Genitive of quantification

Russian numerals are traditionally subcategorized into two groups depending on the number feature carried by the head of the NP they select. The first group of the so-called LOWER numerals includes numerals from 2 to 4, which consistently select a complement headed by a noun in the singular genitive form, as in (1). The second group of HIGHER numerals includes numerals from 5 and above, which select a complement headed by a noun in the plural genitive form, as in (2).

- (1) dva studenta
two student.GEN.SG

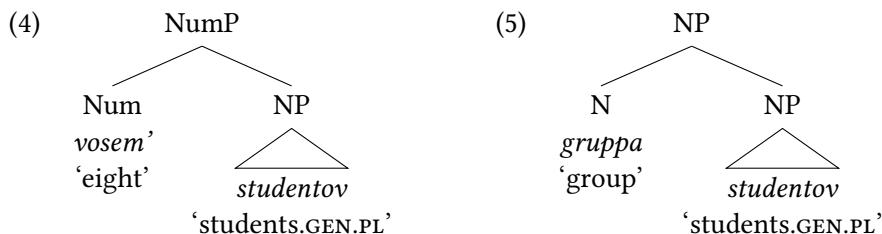
‘two students’

- (2) vosem’ studentov
eight students.GEN.PL

‘eight students’

- (3) gruppa studentov
 group students.GEN.PL
 ‘a/the group of students’

The present paper is concerned with both types of numeral phrases given in (1) and (2) but we start by looking at constructions involving higher numerals, as in (2). The traditional way of analysing (2) is to say that the higher numeral behaves like a noun in the genitive construction, as in (3). That is, the numeral is the head of the NumP taking the quantified NP as its complement and assigning genitive plural to it, so that there is no structural difference between (2) and (3); see (4) and (5).¹



Curiously, the parallel in the case and number features observed in NumPs headed by a higher numeral and genitive constructions in (2) and (3), respectively, only holds for those NP complements whose head noun has both lexical number forms – plural and singular. Although such nouns constitute the overwhelming majority of Russian nouns, there are exceptions. Thus, the Russian noun *čelovek* ‘person’ only has a singular lexical form, whereas the noun *ljudi* ‘people’ only

¹Although (4) represents the most standard approach to NumPs headed by a higher numeral, other analyses exist. One such analysis assumes that the higher numeral is merged in the highest position within the NP and moves to D (Pesetsky 2013). As postulation of the D layer for Russian NPs is rather controversial (see Bošković 2008; Bošković 2010), I adopt a more standard representation of NumPs that essentially assumes the same surface hierarchical structure. Whether the numeral has moved to its surface position from within the NP or is generated in it is immaterial for the present analysis. Another analysis proposed in the literature is based on the observation that a higher numeral can undergo left-branch extraction, and can also receive a case from the outside when its complement receives genitive (as in the Russian *po*-construction). To account for this observation, it has been proposed that the numeral is located in the Specifier of a null head, which itself assigns genitive (Franks 1995, Bailyn 2004). For the purpose of the present analysis, it is immaterial whether the numeral is the head of the numeral phrase that assigns genitive, as in (4), or if it is located in the Specifier of a null head that assigns genitive. The analysis in (4) is adopted here mainly for the ease of exposition.

has a plural lexical form.² As expected, the case-assigning noun in the genitive construction in (6) can select an NP headed by the noun that only has a plural lexical form, see (6a), but not the noun that only has a singular lexical form, see (6b). What is unexpected is that the NumP headed by a higher numeral behaves in the exactly opposite way, see (7). Despite the fact that the higher numeral typically takes a plural NP complement, this NP cannot be headed by a noun that lacks a singular lexical form, see (7a). Instead, an NP headed by a noun that lacks a plural lexical form is selected, see (7b). As a result, the selected NP fails to carry the genitive plural features, and the noun surfaces in the form that is morphologically identical to the default nominative singular form.³

²Due to the fact that *čelovek* and *ljudi* have distinct roots and are historically derived from distinct nouns, I assume that they are distinct lexical items. Importantly, an analysis that assumes that *ljudi* involves contextual root allomorphy of *čelovek* in the context of a higher numeral cannot be sustained because in some contexts, either of the two nouns can surface (see footnotes 13 and 14).

³The fact that the noun in (7b) surfaces in the form identical to the nominative singular form is in line with the idea that nominative is a morphological default (Marantz 1991, Schütze 1997; Schütze 2001). Although languages may differ in the realization of default case, in Russian it is indeed nominative. Thus, the Russian variant of the English phrase *Me intelligent?!* can only contain a nominative noun. Plausibly, the morphological form of the noun in (7b) is a historical remnant of the old declension paradigm from the time when *čelovek* had both number forms, with the nominative singular and the genitive plural forms coinciding. However, since in modern Russian the plural form is no longer available for *čelovek*, the morphological form of this noun in the context of a higher numeral must have been reanalysed as the default nominative singular form that surfaces due to the morphological deficiency of *čelovek* (see the notation in (7b)). Additional support for this view comes from the fact that *čelovek* is not the only noun that is reanalysed in modern Russian as nominative due to the genitive-nominative syncretism. Russian feminine nouns whose nominative plural and genitive singular forms coincide can be construed as nominative plural in the context of a lower numeral thereby affecting the choice of case form of the modifying adjective, see (i.a). The genitive singular form is also available for these nouns in modern Russian but is less common, see (i.b).

- | | | | | |
|-----|----|--|----|---|
| (i) | a. | dve krasivye devočki
two pretty.NOM girls.NOM
'two pretty girls' | b. | dve krasivyx devočki
two pretty.GEN girl.GEN
'two pretty girls' |
|-----|----|--|----|---|

Since both lexical number forms, singular and plural, are available for the noun *devočka* in modern Russian, both structures in (i) are possible. Logically, if one of the lexical number forms disappeared, only one structure in (i) would remain. Plausibly, this is exactly what happened to the noun *čelovek*.

- (6) a. gruppa ljudej
group people.GEN.PL
'a/the group of people'
- b. * gruppa čelovek / čeloveka
group person.NOM.SG person.GEN.SG
- (7) a. * vosem' ljudej
eight people.GEN.PL
b. vosem' čelovek
eight person.NOM.SG
'eight people'

The difference in the choice of the noun form illustrated in (6) and (7) strongly suggests that the structural case assigned by a higher numeral is not identical to the lexical case assigned by a noun in the genitive construction. It has been proposed in the linguistic literature that Russian higher numerals assign the so-called GENITIVE OF QUANTIFICATION (GQ) rather than simple genitive (Bošković 2006). If so, we can hypothesise that GQ places a specific requirement on the head of the NP, which results in the pattern observed in (7). In particular, being a quantificational case, GQ may require that the NP receiving it is headed by a noun that has a lexically realised unit for counting, see (8). Nouns that do not have a singular lexical form will, then, be expected to fail to head an NP that receives GQ, as such nouns lack a lexically realised unit for counting.⁴

⁴The hypothesis put forward in (8) is additionally supported by data involving mass nouns, as in (i) and nouns belonging to the group of pluralia tantum, as in (ii). Both types of nouns lack a unit for counting and, hence, fail to head the NP that received GQ from the higher numeral, see (i.a) and (ii.a). The only way these nouns can occur in NumPs headed by a higher numeral is when they head an NP that receives genitive from the noun that has a lexical singular form and therefore can head the NP that receives GQ from the higher numeral, as in (i.b) and (ii.b).

- | | | | |
|-----|--|------|---|
| (i) | a. * vosem' čaja
eight tea.GEN | (ii) | a. * vosem' nožnic
eight scissors.GEN |
| | b. vosem' stakanov čaja
eight glasses.GEN tea.GEN

'eight glasses of tea' | | b. vosem' par
eight pairs.GEN
nožnic
scissors.GEN

'eight pairs of scissors' |

It is of course true that in English pluralia tantum also fail to head NP complements to numerals. However, since the present paper is on Russian, a discussion of English is left for future

- (8) NPs headed by a noun that lacks a unit for counting are unable to carry GQ.⁵

If the rule given in (8) is correct, Russian higher numerals have a difficult time dealing with nouns that lack one of the lexical number forms. We have seen in (2) that higher numerals require plural agreement with their NP complement. At the same time, (8) demands that the relevant NP is headed by a noun that has a singular lexical form. When the head noun has both lexical number forms, both of these requirements can be obeyed, as in (2). Conversely, when the head noun has only one of the number forms, as is the case with *čelovek* and *ljudi* in (7), a choice must be made as to which requirement is obeyed at the cost of violating the other, given that both of them cannot be obeyed simultaneously. The data in (7) demonstrate that Russian chooses to obey (8) at the cost of violating the requirement for plural agreement. That is, the noun in the well-formed structure in (7b) has a singular form. The NP it heads can therefore receive structural GQ from the numeral. However, this noun lacks a plural form. It therefore fails to realise the genitive plural features required for agreement with the higher numeral and surfaces in the default nominative singular form.

Following Bobaljik (2008), I assume that morphological case (m-case) must be distinguished from structural case, with m-case being treated as a morphological phenomenon applying at PF and structural case as syntactic NP licensing (see also Harley 1995, Marantz 2000, McFadden 2004, Schütze 1997, Sigurðsson 1991, Sigurðsson 2003, Yip-etal 1987, Zaenen-etal 1985). Assuming that the proper place of agreement, which is dependent on m-case, is the morphological component that is a part of the PF interpretation of structural descriptions (Bobaljik 2008), we can argue that in (7) the choice is made between the requirement for the NP complement to Num to be syntactically licensed through structural GQ, and the

research. Another issue that has to be left for future research is that although structures like (ii.a) are never used in formal register and are perceived as ungrammatical by my consultants and myself, they can be found in colloquial Russian. A possible explanation for this occurrence is that speakers that allow (ii.a) analyse the noun heading the NP complement to the numeral in (ii.b) as an optionally null classifier due to its invariable form (i.e., no other noun can be used with pluralia tantum).

⁵This rule refers to nouns that lack a lexically realised unit for counting. This includes mass nouns, collective nouns, pluralia tantum and countable nouns that lack a non-suppletive lexical singular form. Importantly, nouns like *deti* ‘children’ do not fall under this category despite having a suppletive singular form *rebjonok* ‘child’ in modern Russian. This is because the non-suppletive form *ditja* ‘child’ still exists in the language even though it is perceived as stylistically marked and somewhat archaic. The noun *ljudi* ‘people’, conversely, has never had a non-suppletive lexical singular form as it was historically derived from a collective noun, i.e., *ljud* ‘people, folk’ (Chumakina-etal 2004) that already lacked a unit for counting.

requirement for it to realise plural features at PF. The data in (7) suggest that syntactic well-formedness is a stronger requirement. That is, what we observe in (7b) is that a well-formed syntactic representation containing a structurally licensed NP is generated, but when this representation reaches PF, the latter fails to realize the genitive plural features on the defective noun (i.e., the noun that lacks a plural lexical form).⁶

2 The numeral-classifier construction

The pattern observed in (7) breaks down in constructions involving modification or topicalization, see (9) and (10), creating an apparent counterexample to (8). That is, once a modifier interferes between the numeral and the noun, selecting an NP headed by a noun that lacks a singular lexical form becomes possible, as in (9b), in an apparent violation of (8), whereas using a noun that lacks a plural lexical form, as in (9a), is not acceptable to all native speakers of Russian.⁷

- (9) a. % vosem' krasivyx čelovek
 eight pretty.GEN.PL person.NOM.SG
 b. vosem' krasivyx ljudej
 eight pretty.GEN.PL people.GEN.PL
 ‘eight pretty people’

Similarly, when the NP is topicalized, as in (10c), a noun lacking a singular lexical form is selected in an apparent violation of (8). A noun lacking a plural lexical form, on the other hand, cannot be used in topicalized NPs (see (10b)) despite

⁶The present analysis assumes a competition of syntactic and PF constraints, with syntactic constraints winning the competition. I do not propose an Optimality Theoretical account for this competition because I do not take syntactic constraints to be violable.

⁷Although Russian prescriptive grammars state that (9a) is ungrammatical, I have come across speakers that accept it. I have therefore used questionnaires in order to establish which form in (9) is more acceptable to native speakers of Russian (judged on the scale from 1 to 5, with 5 being fully grammatical and 1 fully ungrammatical). Out of forty-six native speakers questioned, four favoured (9a) and forty-two favoured (9b). Out of the group of speakers that favour (9a), two speakers clarified that since the phrase in (7a) is ungrammatical, it should be ungrammatical even in the presence of modification, while the other two speakers did not explain their preference. Out of the group of speakers that favour (9b), eight speakers found (9a) fully ungrammatical (in line with my own judgement as a native speaker of Russian), whereas the remaining thirty-four speakers found it marginally acceptable (none of them gave it a five or a four) but degraded with respect to (9b) (two speakers have independently suggested that (9a) is restricted to contexts involving contrast).

being chosen in the structure prior to topicalization (see (10a)).⁸

- (10) a. V komnate bylo vosem' čelovek.
in room was.3SG.N eight person.NOM.SG
'In the room there were eight people.'
- b. ?? Čelovek₁ v komnate bylo vosem' t₁.
person.NOM.SG. in room was.3SG.N eight
- c. Ljudej₁ v komnate bylo vosem' t₁.
people.GEN.PL in room was.3SG.N eight
'As for people, there were eight of them in the room.'

The data in (9) and (10) present a challenge for (8). In particular, if the higher numeral assigns GQ to its NP complement and thus places the restriction in (8) on it, (9b) should be impossible, as it seemingly contains a syntactically unlicensed NP. Similarly, in (10c) the topicalized NP is expected to reconstruct but it cannot reconstruct into the position where it receives GQ, as in (10a), because reconstruction to this position of the NP headed by a noun that lacks a singular lexical form, as in (10c), violates (8). A logical solution for (10) would be to assume that the topicalized NP in (10c) reconstructs to some other position, where it receives some case other than GQ. If so, this position might also be the position that hosts the NP in (9b). Let us use this assumption as our working hypothesis and try to establish what this position is and what case is assigned to the NPs in (9b) and (10c) and by what head.

As a starting point let us look at (11). We have hypothesised in (8) that a noun lacking a unit for counting cannot head an NP that receives GQ. We have based this hypothesis on (7a) but we expect it to apply to any noun that lacks a unit for counting, including mass nouns. This prediction is indeed borne out in (11).⁹ It is nevertheless possible to express the meaning of (11) with a grammatical sentence as long as the NP headed by a mass noun receives genitive or partitive case from the head of the NP that receives GQ from the numeral, as in (12).

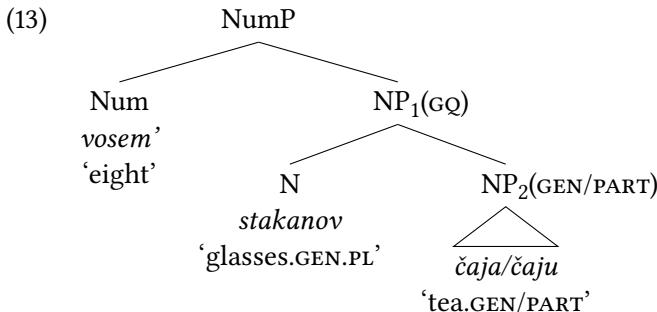
- (11) * Na stole stojalo vosem' čaja / čaju.
on table stood.3SG eight tea.GEN tea.PART

⁸(10b) is marginally acceptable under the interpretation of approximate inversion (although this word order still feels like resulting from a production error) but not under the interpretation and intonation associated with the topicalization of the NP.

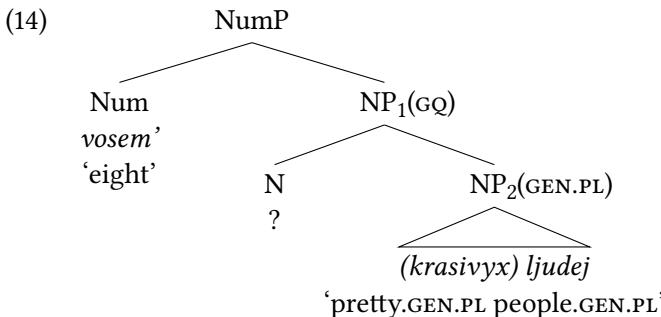
⁹The ungrammaticality of (11) cannot be due to the lack of plural agreement with the higher numeral, as such a violation is tolerated in (7b).

- (12) Na stojalo vosem' stakanov čaja / čaju.
 on table stood.3SG eight glasses.GEN.PL tea.GEN tea.PART
 'There were eight glasses of tea on the table.'

The assignment of GQ is possible in (12) because the NP that receives it is headed by a countable noun that has both lexical number forms. The availability of a singular lexical form ensures that there is no violation of (8), while the availability of a plural lexical form allows for the realisation of the genitive plural features; see (13).



In (13), the mass noun that cannot head NP₁, which receives GQ from the numeral, can nevertheless head NP₂, which is contained in the NumP and c-commanded by the numeral. The crucial hypothesis that I would like to put forward is that the same strategy is used in (9b) and (10c), as shown in (14).



In (14) the NP₂ headed by the noun that lacks a singular lexical form receives genitive plural from a phonologically null QUANTIFYING EXPRESSION (QE) that heads NP₁ carrying GQ.¹⁰ The questions that will be addressed in this section

¹⁰The idea that numeral phrases may contain phonologically null nouns has also been proposed in Kayne2005.

are the following. What is the nature of the QE in (14)? Can it be overt? What licenses its covert status?

I would like to propose that the head of NP₁ in (14) is the lexical variant of the noun ‘person/people’ that only has a singular lexical form, as in (15). (In the following examples, SMALL CAPS mark the focus of the sentence.)

- (15) [Krasivyx ludej]₁ v komnate bylo VOSEM’
 pretty.GEN.PL people.GEN.PL in room was.3SG.N eight
 (čelovek) t₁.
 person.NOM.SG

‘As for pretty people, there were eight of them in the room.’

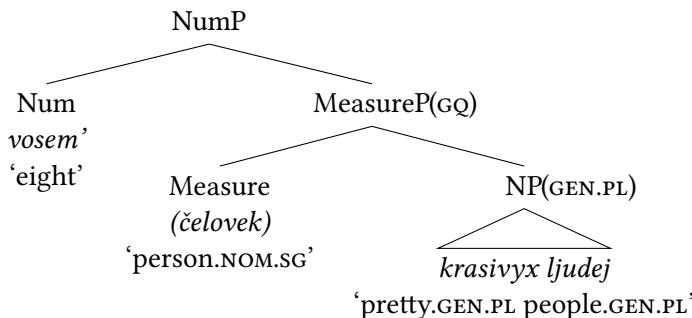
The structure for (15) is given in (16). This construction has been referred to in the linguistic literature as the NUMERAL-CLASSIFIER CONSTRUCTION (NCC) (see [Sussex 1976](#), [Yadroff 1999](#) and [Pesetsky 2013](#)). It is forced in structures with approximate inversion involving modification of the type *čelovek pjat’ krasivyx ljudej* ‘approximately five pretty people’.¹¹ Following [Yadroff \(1999\)](#), I assume that the

¹¹In the absence of modification, inversion can take place in a structure that does not contain the QE *čelovek*; see (i). However, if the noun is modified, any type of movement to pre-numeric position – be it just the noun inverted, as in (ii.b), just the adjective inverted, as in (ii.c), or both words inverted, as in (ii.d) and (ii.e) – is ungrammatical. In this case, the structure in (16) with the inverted pleonastic noun *čelovek* must be used, as in (iii) (see also [Melčuk 1985](#) and [Yadroff 1999](#)).

- | | | |
|-------|---|--|
| (i) | a. pjat’ muzykantov
five musicians.GEN.PL | b. muzykantov pjat’
musicians.GEN.PL five
‘approximately five
musicians’ |
| (ii) | a. pjat’ talantlivyx
five talented
musykantov
musicians.GEN | b. * muzykantov pjat’
talantlivyx
c. * talantlivyx pjat’
muzykantov
d. * talantlivyx muzykantov
pjat’
e. * muzykantov talantlivyx
pjat’ |
| (iii) | čelovek pjat’ talantlivyx muzykantov
person.NOM.SG five talented musicians.GEN.PL
‘approximately five talented musicians’ | |

QE in constructions of the type given in (16) is not a normal noun but a classifier and assign it to a category that Yadroff calls Measure. As can be seen from (15) and (16), the QE that heads the MeasureP can be overt. The option of being covert, on the other hand, is plausibly licensed by the limited semantic function and the semantic recoverability of the QE. To be precise, the QE in (16) has no other semantic function but to pick out a certain number of individuals from the set represented by its NP complement.¹²

(16)



The set denoted by the NP is a subset to the set denoted by the QE. In other words, the set denoted by the NP interpretively restricts the set denoted by the QE. Consequently, the QE consistently represents the superset to the set represented by its NP complement. Plausibly, the default superset construal is one of the factors contributing to the semantic recoverability of the QE. However, as we will see in §4, this is not a sufficient factor and additional restrictions on semantic recoverability apply.

If we are right in assuming that the interpretation of the superset to the set represented by the NP is a crucial factor for the semantic recoverability of the QE, we expect that when *čelovek* does not take an NP complement, it must be overt

¹²If the QE is allowed to be covert due to its limited semantic function, we expect that when it performs an additional semantic function, it must be overt. This is indeed the case in structures involving approximate inversion, where the QE cannot be covert; see (i).

- (i) a. čelovek pjat' krasivyx ljudej
 person.NOM.SG five pretty people.GEN.PL
 'approximately five pretty people'
 b. pjat' krasivyx ljudej
 five pretty people.GEN.PL
 'five pretty people' (not: 'approximately five pretty people')

and the set it represents is unrestricted. This is indeed the case in (7b), where *čelovek* takes no NP complement. It therefore refers to an open set of people and is obligatorily overt.

The analysis in (16) entails that Russian higher numerals consistently assign GQ to their complements and that (8) always holds, whereas the NP headed by the noun *ljudi* never ends up in the position receiving GQ. Instead, this NP is consistently selected by an optionally null QE that assigns genitive plural to it. This assumption captures the problematic data in (9) and (10). Yet, the reader might wonder why the structure in (16) is not used in (7a), which should make it well formed. I would like to argue that the structure in (16) is indeed available for (7a) but employment of this structure results in semantic oddness. Indeed, the structure in (7a) is as semantically odd as the one in (17), where the QE is overt, because in both examples the open set of people represented by the QE (covert or overt) is not restricted by a more specific subset of people denoted by its NP complement. The NP is interpreted as referring to an open set of people but an open set of people is already denoted by the QE. We have argued that the QE can only take an NP complement that restricts its set. That is, given that in (16) the QE denotes an open set of people, the NP must refer to a set of people with some specific features or qualities, such as ‘pretty people’ in (9b). Whenever the QE takes an NP complement that represents exactly the same open set, this results

in redundancy and subsequent semantic oddness; see (7a) and (17).¹³

- (17) * vosem' čelovek ljudej
 eight person.NOM.SG people.GEN.PL

Crucially, whenever the NP that is complement to the QE is topicalized, as in (10c), semantic oddness disappears, strongly suggesting that the topicalized NP refers to a more specific set than the one denoted by the QE. In the next section, we discuss the nature of this set and discover why the structure in (16) is obligatory for (10c).

3 The plurality requirement

We have argued that modification makes it possible for higher numerals to take MeasureP complements headed by an optionally null classifier that in turn takes an NP complement that can be headed by the noun *ljudi*; see (9b) and (16). We have maintained that this option is determined by the semantics of the NP. In particular, the NP must restrict the set denoted by the classifier. In the absence of such a restriction, the NCC cannot be formed (see (7a) and (17)), whereas modification makes such a restriction possible. At the same time, we have seen that the structure with *čelovek* in (9a) is acceptable to some speakers but not others

¹³ As expected, (7a) improves when the set represented by the QE is semantically restricted, as in (i). The acceptability of (i) strongly suggests that (7) cannot be accounted for by assuming a morpho-phonological constraint that bans linear adjacency between *vosem'* and *ljudej*. Furthermore, linear adjacency is possible in a coordinate structure with the interpretation ‘a group of (approximately) 8 individuals some of which are men and some hobbits’; see (ii.a). As can be seen from (ii), when the QE selects a coordinate NP that represents two sets – a set of people and a set of hobbits, no semantic oddness obtains because the set denoted by the QE is restricted by a more specific subset of hobbits.

- (i) ? vosem' ljudej s krasivymi licami
 eight people.GEN.PL with pretty faces
 ‘eight people with pretty faces’

- (ii)
 - a. (čelovek) vosem' ljudej i hobbitov
 person.NOM.SG eight people.GEN.PL and hobbits.GEN.PL
 ‘(approximately) eight people and hobbits’
 - b. (čelovek) vosem' hobbitov i ljudej
 person.NOM.SG eight hobbits.GEN.PL and people.GEN.PL
 ‘(approximately) eight hobbits and people’

(see footnote 7). Let us consider the grammar of both types of speakers. Plausibly, speakers who (like myself) find (9a) ill formed interpret the noun *čelovek* in (9a) as a classifier due to its impoverished morphological form. This is because nouns that have both lexical number forms surface in the nominative singular form when used as classifiers (see (18a)) but in the plural genitive form required for agreement with the higher numeral when used as heads of NPs (see (18b)). When the noun is nominative singular and hence construed as a classifier, modification is impossible (see (18c)) in line with the observation that classifiers generally resist modification. By hypothesis, speakers of my variety transfer the classifier analysis to any noun that surfaces in the nominative singular form in the context of a higher numeral and analyse (9a) in parallel with (18c).

- (18) a. vosem' kilogramm jablok
eight kilogram.NOM.SG apples.GEN.PL
'eight kilograms of apples'
- b. vosem' polnovesnyx kilogrammov
eight full-weight.GEN.PL kilograms.GEN.PL
'eight full-weight kilograms of apples'
- c. * vosem' polnovesnyx kilogramm
eight full-weight.GEN.PL kilogram.NOM.SG

The fact that nominative singular classifiers generally resist modification is plausibly due to a ϕ -feature conflict that results from the adjective realising the case and number features required for agreement with the higher numeral and the classifier being unable to realise them, as in (19).¹⁴

¹⁴The ungrammaticality of (9a) cannot be due to modification as such, as modifiers that do not enter into an agreement relation with *čelovek* can surface in this type of construction; see (i) below.

(i) vosem' čelovek s krasivymi licami
eight person.NOM.SG with pretty faces
'eight people with pretty faces'

- (19)

```

    graph TD
        NumP[NumP] --> Num[Num  
vosem,  
'eight']
        NumP --> NP["NP(GO)"]
        NP --> AdjP[AdjP]
        NP --> N[N]
        AdjP --> krasivyx["krasivyx  
'pretty.GEN.PL'"]
        N --> čelovek["čelovek  
'person.NOM.SG'"]
    
```

(ϕ-feature conflict)

Since the adjective in (9a) and (19) is part of the NP that enters into an agreement relation with the numeral, it must realise the genitive plural features. Incidentally, no other morphological form of the adjective but genitive plural can surface in NPs receiving GQ from a higher numeral.¹⁵ The classifier, conversely, surfaces in what appears to be the default nominative singular form. This, in turn, generates a conflict within the NP resulting from a mismatch in the case and number features between the head and the modifier; see (19).¹⁶ Plausibly, it is this mismatch that results in the ill-formedness of (9a) for speakers of my variety. Naturally, a structure with a plural noun, as in (9b), does not suffer from a ϕ -feature conflict. However, the NP in (9b) cannot carry GQ as it is headed by a noun that lacks a singular lexical form; see (8). Hence, the NCC in (16) must be formed for (9b). To rephrase, (16) is licensed by the plurality requirement placed on the noun by the adjective in my variety of Russian.¹⁷

Conversely, speakers that accept (9a) must be insensitive to the aforementioned

¹⁵ Unlike Serbo-Croatian, Russian does not have uninflected ‘indeclinable’ modifiers.

¹⁶ It appears that the crucial violation here is the case feature mismatch, as a number feature mismatch is tolerated in Russian NPs that are complements to lower numerals. Pesetsky (2013) accounts for the number feature mismatch found in contexts of paucals by assuming that the adjective merges with N or a projection of N and agrees with the closest number-bearing element, which is the [-singular] paucal. The noun, on the other hand, enters syntax bearing no number feature (NBR) and immediately merges with the paucal, which is a free-standing instance of NBR rather than a numeral. As a result, the adjective is [-singular], whereas the noun is not specified for the [-singular] feature.

¹⁷In the absence of a plurality requirement, the formation of the NNC is possible only when the QE is overt, as in (i) and (ii).

- (i) čelovek vosem' talantlivyx muzykantov
 person.NOM.SG eight talented.GEN.PL musicians.GEN.PL
 'approximately eight talented musicians'

(ii) V orkestre rabotajet pjat' čelovek skripačej, i šest' čelovek
 in orchestra work.3SG five person.NOM.SG violinists.GEN.PL and six person.NOM.SG

tioned ϕ -feature conflict. This might be because, even in the absence of modification, such NumPs involve a ϕ -feature violation that is tolerated, i.e., the noun in (7b) does not realise the genitive plural features required for the agreement with the higher numeral. By hypothesis, insensitivity to the ϕ -feature conflict between the adjective and the noun allows these speakers to interpret *čelovek* as a full noun rather than a classifier despite its impoverished morphological form. If so, the structure in (4) is generated in the grammar of these speakers for the numeration in (9a), while the NCC in (16) is generated whenever the simpler structure in (4) is unavailable, as in (9b). We would, then, expect to find speakers that favour (9a) over (9b) due to its simplicity along with speakers that accept both structures to a certain degree but assign distinct contextual interpretations to them. This prediction appears to be borne out (see footnote 7).

Since for speakers of my variety, (9a) is ill formed due to a plurality requirement placed on the noun, which in turn triggers the structure in (16), it is not completely outlandish to assume that (10b) is ill formed for a similar reason. Namely, a plurality requirement is placed on the topic NP, which rules out the structure with a noun that lacks a plural lexical form. I would like to propose that the relevant plurality requirement follows from the interpretive properties of NumPs that contain a trace of a topic NP. Let us consider these properties. The sentence in (10c) has a typical Top/Foc structure, with the topic NP construed as a CONTRASTIVE TOPIC (CT) and the numeral constituting the NARROW FOCUS of the sentence. Thus, (10c) most naturally occurs in a context that asks about the quantity of individuals present in the room and therefore licenses narrow focus on the numeral, as in (20). It is, however, incompatible with a context that licenses focus on the entire NumP, as in (21). (Sentences marked with ‘#’ are grammatical but incompatible with the given context.)

- (20) Q: Skol'ko ljudej bylo v komnate?
 how.many people.GEN was.3SG.N in room.PREP
 ‘How many people were there in the room?’
 A: Ljudej₁ v komnate bylo VOSEM' t₁.
 people.GEN.PL in room was.3SG.N eight
 ‘As for people, there were eight of them in the room.’
- (21) Q: Kto byl v komnate?
 who was.3SG.M in room.PREP
 ‘Who was in the room?’

duxovikov.

wind-players.GEN.PL

‘In the orchestra work five violinists and six wind-players.’

- A: # LJUDEJ₁ v komnate bylo VOSEM' t₁.
people.GEN.PL in room was.3SG.N eight
'As for people, there were eight of them in the room.'

The question (20Q) can be answered by a simpler sentence that does not contain a CT; see (22).

- (22) Q: Skol'ko ljudej bylo v komnate?
how.many people.GEN was.3SG.N in room.PREP
'How many people were there in the room?'
A: V komnate bylo VOSEM' čelovek.
in room was.3SG.N eight person.NOM.SG
'In the room there were five people.'

However, the replies (20A) and (22A) are not only structurally different, their interpretation is also distinct: while (22A) merely answers the question about the quantity of people in the room, (20A) additionally conveys that people were not the only individuals present in the room that are relevant for the discussion at hand but they were the only individuals for whom the quantity (i.e., the focus value) is known. Since for other individuals in the room the quantity is unknown, the sentence is perceived as providing incomplete information. The interpretation of incompleteness is what characterizes the information-structural (IS) category of CT (Büring 2003), strongly suggesting that the topic NP in (20A) and (10c) is a CT.¹⁸ This conclusion is further supported by the observation that (10c) has the prosodic pattern typical of CT/Foc sentences, with the rising topic contour IK3 on the topicalized NP and the falling contour IK1 on the focused numeral (Bryzgunova 1971; 1981, Titov 2013).

The set introduced by the CT in (20A) and (10c) is a subset of a set of individuals that were present in the room. That is, even when the CT refers back to an identical discourse-antecedent, as in (20), the sentence itself activates the superset construal, as it conveys that just a subset of the set of individuals in the room that are relevant for the discourse at hand are people. This means that the superset for the set of people becomes salient at the point the sentence is uttered.

The above observation provides an answer to the question we posed in the previous section. Recall that while the sentences in (7a) and (17) are semantically odd because the QE in these examples takes an NP complement that represents exactly the same open set, the sentence in (10c) does not suffer from semantic oddness. We have suggested that this is because the topicalized NP refers not

¹⁸To be interpreted as a CT, the relevant NP must linearly precede the focus in Russian (Titov 2013).

to an open set of people but to some other set that restricts the set introduced by the QE. Indeed, contrastive construal of the topicalized NP in (10c) results in the interpretation according to which this NP belongs to a contextually closed set of individuals that were present in the room, for some of whom the quantity is unknown. In other words, the CT in (10c) does not represent an open set of people but a subset of individuals that were present in the room. Plausibly, this contextual restriction of the set to which the NP belongs eliminates redundancy and semantic oddness that we observe in (7a) and (17).

Another crucial observation as regards the interpretive properties of (10c) is that the NumP here is obligatorily non-referential. This is because the verb here is in the default third person singular form. The availability of default agreement is due to NumPs in Russian being construed by syntax either as NPs or QPs (Pesetsky 1982). In the former case, the verb agrees with the nominative NP, as in (23a), and the NP allows for definite/specific reading, while in the latter case, agreement cannot take place and the QP is interpreted as a non-specific indefinite (see (23b)) (Titov 2012).¹⁹

- (23) a. V komnatu vošli (èti) vosem' čelovek.
 in room entered.3PL these eight person.NOM.SG
 '(These) eight people entered the room.'
 b. V komnatu vošlo (*èti/ètix) vosem' čelovek.
 in room entered.3SG these.NOM/GEN eight person.NOM.SG

We have seen that the sentence in (10c) has narrow focus on the numeral. Plausibly, this IS partitioning forces syntax to interpret the NumP as a QP rather than an NP, as the sentence in (10c) cannot contain an agreeing verb (see (24)),

¹⁹The fact that NumPs in sentences with default agreement cannot be referential is further supported by the observation that they cannot take an apparent wide scope typical of specific indefinites; compare (i) and (ii) below. While the sentence in (ii) allows for the reading where two specific students failed all of the exams, (i) can only mean that for each exam there were two students that failed it.

- | | |
|--|---|
| <p>(i) Govorjat, čto každyj examen provalilo dva studenta.
 they-say that every exam.ACC failed.3SG two students
 'They say that every exam was failed by two students.'</p> <p>(ii) Govorjat, čto každyj examen provalili dva studenta.
 they-say that every exam.ACC failed.3PL two students
 'They say that every exam was failed by two students.'</p> | <p>[A > È; *È > A]</p> <p>[A > È; ?È > A]</p> |
|--|---|

resulting in the obligatorily non-specific indefinite construal of the NumP (see (25)).

- (24) * Ljudej₁ v komnate byli vosem' t₁.
 people.GEN.PL in room was.3PL eight
- (25) Ljudej₁ v komnate bylo (*èti/ètix) vosem' t₁.
 people.GEN.PL in room was.3SG.N these.NOM/GEN eight
 ‘As for people, there were (*these) eight of them in the room.’

Due to the non-specific construal, the NumP in (10c) cannot refer to a specific set of eight people. Instead the focused numeral selects a subset of eight people from the set introduced by the CT (i.e., the NP), strongly suggesting that we are dealing with the so-called set partitive interpretation of the NumP.²⁰ Given that only NPs that can denote sets of entities are allowed in set partitives, such NPs must contain plural nouns (de Hoop 1997). Hence, it is the set partitive construal of the NumP that places a plurality requirement on the topic NP in (10c), rendering (10b) ungrammatical.²¹

It has been suggested that the quantifier in partitive constructions is followed by an empty noun (Milner 1978, Bonet & Solà 1986, Abney 1987, Hernanz-Brucart 1987, Delsing 1988; 1993, Ramos 1992, Cardinaletti-Giusti 1992; Cardinaletti-Giusti 2006, Sleeman 1996, Doetjes 1997, Barker 1998, Brucart-Rigau 2002, Ionin-etal 2006). This assumption is motivated by the observation that a partitive construction of the type given in (10c) denotes two sets (here it is a general set of people and a set of eight people present in the room). The Catalan example in (26a), where *e* is lexically identical to *homes* ‘men’, illustrates this idea.

- (26) Catalan (MartiiGirbau 2010)
- a. tres e d'aquells homes d'allá
 three of-those men over-there
 ‘three of those men over there’
 - b. tres homes d'aquells homes d'allá
 three men of-those men over-there
 - c. tres homes d'aquells e d'allá
 three men of-those over-there

²⁰Numerals cannot occur in entity partitives.

²¹Following Barker (1998), I assume that partitives are ANTI-UNIQUE. Due to anti-uniqueness, partitives are inherently non-specific indefinites, resulting in DP partitive constructions being unable to be headed by a definite determiner. The data in (25) can be seen as supporting this idea.

In (26a), the partitive construction refers to two sets of men: the set of those men and the set of three men, the latter being a subset of the former. The NumP in (26b) has an overt noun inserted between the quantifier and the PP and is grammatical, albeit odd and redundant to a native speaker. The NumP in (26c) has an empty noun holding the final noun position. Overall, this is taken as evidence that an empty noun category should be posited to license a partitive meaning. In line with this observation, the present analysis assumes the structure in (16) for the partitive NumP in (10c), where an optionally null classifier occurs between the numeral and the genitive NP.

In this section, we have argued that a plurality requirement placed on a noun forces the structure in (16) whenever this noun lacks a singular lexical form and can therefore not head an NP that receives GQ from a higher numeral; see (8). Economy considerations predict that the more complex NCC is generated for NumPs that do not have an overt QE if and only if a plurality requirement forces plural features on the noun but the NP this noun heads fails to be generated in the complement to the numeral position, for instance because of (8). In this case, and this case alone, the simpler structure in (4) is not available for the given numeration. In all other cases, (4) is chosen by the grammar as the more economical structure.

4 Franks-House1982

Further evidence for the NCC analysis comes from the data discussed in **Franks-House1982** that involve topicalization of an NP in the genitive plural form that appears to take place from a position to which genitive singular is assigned; see (27).

- (27) Romanov₁ na stole bylo dva t₁. (Franks-House1982)
 novels.GEN.PL on table was.3SG.N two

‘As for novels, there were two of them on the table.’

- (28) a. Na stole bylo dva romana.
 on table was.3SG.N two novel.GEN.SG
 ‘On the table there were two novels.’
- b. *Na stole bylo dva romanov.
 on table was.3SG.N two novels.GEN.PL

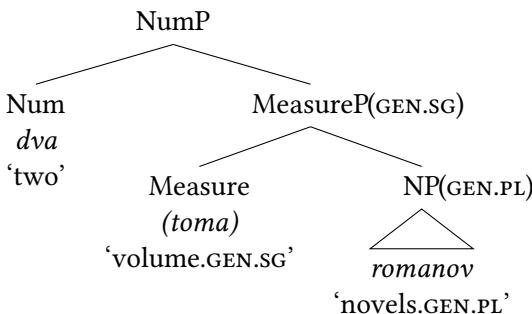
The head of the numeral phrase in (27) is a lower numeral that consistently takes a genitive singular NP complement, as in (28a). A genitive plural NP cannot be licensed in the complement to lower numeral position; see (28b). Yet, while the

topicalized NP *romanov* ‘novels’ in (27) carries a genitive case marker, it is, surprisingly, in a plural form. **Franks-House1982** maintain that the topic NP cannot have been extracted from the argument *dva* ‘two’ because the latter assigns the genitive singular, not the genitive plural. Hence, they propose that the genitive NP is an external topic that forms a constituent with a covert quantifier, which accounts for the genitive case marking. The overt quantifier raises at LF, licensing the null quantifier of the genitive constituent. However, as **Franks-House1982** point out, the genitive topic in (27) is different from other attested external topics in Russian (i.e., nominative topics) in that the former is not obligatorily followed by a pause. Moreover, the genitive topic in (27) requires a numeral in the clause that refers back to the genitive NP. This, of course, cannot be said about other external topics. And finally, **Franks-House1982**’s analysis of the number agreement mismatch in (27) cannot be applied to the cases of number agreement inconsistencies discussed above that do not involve topicalization.

Hence, the NCC analysis appears to be better suited for (27). On this account, the sentence in (27) contains an optionally null QE whose semantic set is restricted by the topic NP, as in (29) and (30). The structure in (30), just like the one in (16), is licensed by two conditions: (i) the plurality requirement placed on the CT (i.e., NP) that moves out of a non-specific NumP with a set partitive construal, and (ii) the impossibility of reconstruction of the plural NP to the complement to Num position. In the case of (16), the latter condition results from (8). In the case of (30), it results from the fact that a lower numeral cannot take a plural NP complement; see (1) and (28b). Importantly, the generation of the more complex NCC is possible only when the two conditions prevent the generation of the simpler structure in (4). In all other cases, economy rules out the NCC and the structure in (4) is used.

- (29) Romanov₁ na stole bylo DVA (toma) t₁.
novels.GEN.PL on table was.3SG.N two volume.GEN.SG
'As for novels, there were two volumes on the table.'

(30)



By analogy with (16), the head of the MeasureP in (30) is optionally null. As the set represented by the QE is consistently a superset to the set introduced by its NP complement, the QE is semantically recoverable, in the sense that when it is null, it can be interpreted as representing any set of which the set denoted by the NP is a subset. In (30) the overt QE denotes a set of volumes on the table out of which a set of novels is a subset, but the set represented by the QE can be even more open and denote a set of books on the table out of which a set of novels is a subset, as in (31).

- (31) Romanov na stole bylo DVE knigi.
 novels.PART/GEN.PL on table was.3SG.N two book.GEN.SG
 ‘As for novels, there were two books on the table.’

Typically, the set represented by the QE is contextually specified, as in (32) where it is given as the superset in the contextual question. That is, depending on whether the items on the table out of which the set of novels is selected are books or different kinds of reading materials (e.g. novels, newspapers, magazines, journals etc.) or different kinds of unrelated items (e.g. novels, apples, plates, flowers etc.), the set can be as open as to include all inanimate entities, as long as the context (linguistic or extra-linguistic) warrants such a construal.

- (32) Q: Skol’ko knig bylo na stole?
 how many books.GEN was.3SG.N on table.PREP
 ‘How many books were there on the table?’
- A: Romanov na stole bylo DVE knigi,
 novels.PART/GEN.PL on table was.3SG.N two book.GEN.SG
 stixov (na stole bylo) TRI (knigi), a
 poems.PART/GEN.PL on table was.3SG.N three book.GEN.SG and
 slovarej (na stole bylo) ČETYRE (knigi)
 dictionaries.PART/GEN.PL on table was.3SG.N four book.GEN.SG
 ‘There were two books of novels on the table, three (books of) poems
 and four (books of) dictionaries.’

It is, however, plausible that when the QE in (30) is phonologically null and the context does not specify the nature of the set it denotes, it is interpreted as representing the most open set out of which the set denoted by its NP complement is a subset. We have seen that the most open superset for individuals is a set of people represented by the noun *čelovek*. Similarly, in (30) the most open superset for the set of inanimate entities is the set of items, represented by the noun *štuka*, as in (33).²²

- (33) Romanov na stole bylo DVE štuki.
 novels.PART/GEN.PL on table was.3SG.N two item/thing.GEN.SG
 ‘As for novels, there were two items on the table.’

In (33), the noun *štuka* ‘item/thing’ selects a certain number of entities from a set of novels in exactly the same fashion as the noun *čelovek* ‘person’ selects a number of individuals from a set of pretty people in (15) so that the only difference in the construal of the QEs in (33) and (15) lies in the features [±animate] and [±human].²³ In other words, *štuka* represents the most open set of entities, while *čelovek* denotes the most open set of individuals. Plausibly, in the absence of a contextual disambiguation, the null QEs in NCCs are interpreted as referring to these open sets.

Above, we mentioned that the superset construal of the QE is not sufficient for it to remain null and that additional restrictions on semantic recoverability apply. To be precise, while QE in (30) can remain covert in structures involving contrastive topicalization, as in (27), in the absence of topicalization, it must be overt; see (34).

²²The QE in (31)–(33) cannot be phonologically null when Num carries feminine gender features required for agreement with the feminine MeasureP. When the QE is null, Num agrees in gender with the masculine NP. As the MeasureP and the NP in (31)–(33) have distinct gender features, the constructions with an overt and a covert QE have distinct agreement features on the numeral.

²³Yadroff (1999) analyses the nouns *štuka* and *čelovek* used in NCCs as pleonastic noun classifiers. He argues that the class of classifiers found in NCCs is closed, with *štuk* ‘items.GEN.PL’ replaced with *ěkzempljárov* ‘copies.GEN.PL’ in formal register, and *čelovek* ‘person.NOM.SG’ replaced with *duš* ‘souls.GEN.PL’ in archaic texts. However, as can be seen from (29)–(32), it is possible to have other nouns performing the role of the QE as long as they represent a superset to the set denoted by the NP complement. Just like any other classifier mentioned by Yadroff, the QEs in (29)–(32) can occur in a construction involving approximate inversion, as in (i).

- (i) knig / tomov pjat’ istoričeskix romanov
 books.GEN.PL volumes.GEN.PL five historical.GEN.PL novels.GEN.PL
 ‘approximately five books/volumes of historical novels’

- (34) a. Na stole bylo dva toma romanov.
 on table was.3SG.N two volume.GEN.SG novels.PART.PL
 ‘There were two books of novels on the table.’
- b. *Na stole bylo dva romanov.
 on table was.3SG.N two novels.PART.PL

Plausibly, the option of remaining covert in (27) is due to the IS partitioning of the non-referential NumP into focus on the Num and CT on the NP, which results in a set partitive construal of the NumP, which in turn requires the presence of the QE (null or overt) in order for the partitive construction to denote two sets. It follows, then, that partitive construal itself presupposes the NCC containing the QE. Conversely, in (34b), it is impossible for the NumP to have the corresponding CT/Foc partitioning because the NP does not move across the numeral (Titov 2013). Hence, in the absence of contrastive topicalization, the QE must be overt. Yet, there is one exception to this rule, i.e., the QE can stay covert and be recovered when it refers to the same set as denoted by the head of its NP complement, as in (9b) where both heads select out of a set of people; see (16). This rare occurrence is due to the deficient lexical number forms of the two nouns, which allows them to co-occur as long as there is a restriction of the set represented by the QE by the set denoted by its NP complement that can be achieved either via modification or topicalization. Since both heads in (16) denote the same set, the referent of the QE is recoverable from the referent of the head of the NP.

5 Conclusion

In this paper, we have discussed two types of number agreement mismatch in Russian numeral phrases. We have proposed a unified syntactic account for both phenomena that assumes the NCC in (16) and (30) where the plural NP is a complement to an optionally null QE. We have argued that the structure is forced by a plurality requirement placed on the head of the NP, and either the selectional requirement of a lower numeral, as in (27), or by (8), as in (9) and (10). We have maintained that the optionally covert status of the QE results from its limited semantic function, and its semantic recoverability. The latter obtains in two cases, the most common of which involves contrastive topicalization and partitive construal that results in the salience of the set represented by the QE. The other case is restricted to nouns that lack one of the lexical number forms, in which case the referent of the QE is identical to the referent of the head of its NP complement, allowing for its semantic recoverability.

Abbreviations

3	third person	NCC	numeral-classifier
ACC	accusative		construction
CT	contrastive topic	NOM	nominative
GEN	genitive	PART	partitive
GQ	genitive of quantification	PL	plural
IS	information structure/al	PREP	prepositional case
M	masculine	QE	quantifying expression
N	neuter	SG	singular

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Chapter 19

Russian case inflection: Processing costs and benefits

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Mechanisms underlying the processing and storage of morphological case are still debatable in psycholinguistics. The key questions concern the nature of the special status of the nominative, the homogeneity/heterogeneity of oblique case forms, the impact of case syncretism and paradigmatic relations on nominal processing and the organization of the mental lexicon. We investigate these issues turning to Russian nominal processing. We performed two experiments with feminine and masculine nouns in different cases (experiment 1: nouns in singular, experiment 2: nouns in plural) using the visual lexical decision task. In this task, we measure the speed and accuracy with which the participant classifies sequences of letters as words or non-words. Evidence from both experiments indicates that differences in processing exist not only between the nominative and the other case forms, but also among the obliques. Experiment 1 points to the influence of wordform and exponent ambiguity, while experiment 2 reveals effects that are specific for case per se. We discuss the role of zero vs. overt phonological form, grammatical features, (non-)accidental homonymy, context, frequency, inflectional and relative entropy in case recognition.

1 Introduction

The role of frequency and regularity in processing of inflectional morphology has for long been of utmost concern for psycholinguists. Meanwhile, it is still not clear whether grammatical features that an inflectional marker conveys play an additional role in wordform processing. For instance, if we are speaking about nouns, a natural question to ask is how case influences nominal recognition.

Studies of isolated wordform processing suggest that nominative wordforms are processed faster than other case forms (see, e.g. Lukatela 1978; lexical for Ser-

bian; niemi1994cognitive for Finnish; abulizi2016cognitive for Uyghur; gor2017processing for Russian). Yet, there is no uniform explanation of this fact. Likewise, it is debatable whether oblique cases entail equal processing costs or not.

Finnish and Uyghur researchers provide only the pooled mean for all the inflectional variants, comparing it to the nominative and do not inspect contrasts between oblique forms, though they usually use more than one oblique case in their experiments (niemi1991recognition; niemi1994cognitive; hyovcnavc1995effects; laine1998lexical; laine1999lexical; abulizi2016cognitive). As the nominative has zero inflection in these languages, oblique processing cost is attributed to a morphological decomposition procedure that is obligatory for inflected obliques, but absent in the non-inflected nominative.

This explanation is unsatisfactory for several reasons. Firstly, the nominative advantage disappears when case forms are embedded in context (bertram2000role; hyona2002morphological). bertram2000role and hyona2002morphological suggest that oblique processing disadvantage in a context-less environment arises not due to the decomposition cost, but precisely due to the lack of an appropriate context. Yet, they do not examine if all oblique cases suffer from the lack of context or benefit from its presence to the same extent. Secondly, processing of zero inflection receives a benefit in recognition speed only if the zero is associated with the nominative, but not with an oblique case (gor2017processing). Finally, phonologically zero and overt nominatives appear not to differ in processing speed (see, e.g., lukatelaEtAl1980 for Serbian; gor2017processing for Russian). Thus, it is not the zero inflection that makes Finnish and Uyghur nominative wordforms special, but the the nominative case itself.

Early Serbian studies did compare processing of oblique cases, but mainly failed to find significant differences in response latencies (lukatela1978lexical; lukatelaEtAl1980; lukatela1987lexical; katz1987grammatical; kostic1987processing; feldman1987inflected). These results, starting with lukatelaEtAl1980, were analyzed within the satellite model. The nominative form represents the nucleus of the nominal paradigm, while oblique case forms surround it as satellites. Satellites are assumed to be equidistant from the nucleus (feldman1987inflected). Deviations from the predictions of this model were attributed to specific experimental settings in case of nouns (feldman1987inflected; todorovic1988hemispheric); differences in adjectival case processing were assumed to rely on different mechanisms (kostic1987processing). However, not more than three case forms belonging to one number were compared at once. It is likely that some effects that could show up in a more elaborate design were obscured. Moreover, ambiguity of case forms that is present in Serbian declension did not receive enough attention.

According to subsequent Serbian studies, processing speed of a wordform correlates positively with the number of syntactic functions/meanings that its inflectional ending encompasses (**kostic1991informational**; **kostic1995information**; **kostic2003inflectional**; **filipovic2003processing**; **vseva2003annotated**), which hints at oblique processing differences. The proposed methodology of calculating syntactic functions/meanings is not flawless, since the authors bring under this umbrella term both syntactic notions such as subject or complement and semantic notions such as instrument or goal. Furthermore, it is not taken into account that lexemes in the same case have different probabilities of expressing the same thematic role, e.g. ‘girl-INS’ is less likely to be an instrument than ‘hammer-INS’. Likewise, as all homonymous forms are treated equally, differences between accidental and non-accidental ambiguity is disregarded.

Later on, this problematic measure was abandoned, and the focus was shifted to paradigmatic relations between wordforms captured by inflectional and relative entropy measures (see, e.g. **milin2009simultaneous**). The inflectional entropy $H(P)$ reflects the amount of information associated with the inflectional paradigm of the target lexeme (see (1)), where f stands for frequency, the word-form w_i belongs to the paradigm P of a lexeme w) and correlates negatively with response latencies: when a lexeme has a higher value of the inflectional entropy, its wordforms are processed faster, and vice versa (**del2004putting**). The relative entropy $D(IP||IC)$ captures the divergence between the frequency distribution of the target lexeme w and the frequency distribution of its inflectional class IC (see (2)), where e_i stands for inflectional exponent), and it correlates positively with response latencies: wordforms belonging to paradigms with higher values of relative entropy are processed more slowly (**milin2009simultaneous**). When surface and lemma frequency combined with entropy measures are taken into account, case differences appear to play no additional role (**milin2009simultaneous**); yet, this claim was made on a small subset of wordform: wordforms in *-u* ‘ACC.SG’ and *-e* ‘GEN.SG’/‘NOM/ACC.PL’ for feminine nouns, wordforms in *-om* ‘INS.SG’ and *-u* ‘DAT/LOC.SG’ for masculine nouns.

(1)

$$H(P) = - \sum_{w_i \in P} \frac{f(w_i)}{f(w)} \log_2 \frac{f(w_i)}{f(w)}$$

(2)

$$D(IP||IC) = \sum_{w_i \in P} \frac{f(w_i)}{f(w)} \log_2 \frac{f(w_i)/f(w)}{f(e_i)/f(e)}$$

Another viewpoint predicting differences in oblique case processing and paying attention to wordform ambiguity was developed primarily by [clahsen2001mental](#). They adopted minimalist principles in morphology (see, e.g., [wunderlich1996minimalist](#)), suggesting that in the mental lexicon, the meaning of a case exponent is represented as a set of binary features. Non-accidental ambiguous inflectional markers receive underspecified representations. Along with this “natural” underspecification, radical underspecification is assumed to be present as well: only positive values are stored in the mental lexicon, while negative ones are deduced from paradigmatic oppositions. Hence, a direct implication for the psycholinguistic models of wordform processing arises. The number of specified (positive) features should determine the processing ease: the more information a form carries, the longer it takes to be recognized.

Main evidence supporting this claim comes from studies on German adjectival declension. Adjectival case forms with more specified representations are recognized slower in the lexical decision task ([clahsen2001mental](#)). Such case forms show reduced priming effects under cross-modal priming if the adjective serving as a prime does not share all the positive features with the target ([clahsen2001mental](#)). Similar priming effects are to a certain extent replicable even with highly proficient L2-German speakers ([bosch2016accessing](#); [bosch2017time](#)). As far as sentence processing is concerned, when an ungrammatical sentence contains an adjective or a determiner that is compatible with the context by its feature specification, this does not lead to an ungrammaticality effect in a sentence matching task, observed for ungrammatical sentences where specificity is violated, i.e. when the feature set of the wordform mismatches context requirements ([penke2004psycholinguistic](#)). These two types of ungrammatical sentences result in distinct ERP responses ([opitz2013neurophysiological](#)).

If the radical underspecification hypothesis is true, the same principles should hold for nominal case inflection in other languages as well. Yet, prior studies on case processing shed doubts on its tenability, and additional evidence is needed.

2 Present study

The present study aims to verify whether case form processing is determined by the grammatical features, nominative vs. oblique dichotomy, or context. We addressed this issue in two lexical decision task experiments employing Russian data: experiment 1 with singular nouns and experiment 2 with plural nouns.

Russian was not chosen incidentally, but due to its particular pattern of case syncretism (convergence of inflectional exponents in different paradigmatic cells).

Russian has six major cases and several inflectional classes of nouns. We will restrict ourselves to inanimate nouns and discuss only two most productive inflectional classes (`wiese2004categories`): feminine nouns with the nominative ending *-a* and masculine nouns with the nominative ending *-Ø*. As is evident from Table 1, the two classes of nouns choose uniform endings in plural (except for genitive), but behave differently in singular.

Table 1: Russian case endings for the two most productive inflectional classes

		Nom	Acc	Gen	Dat	Loc	Ins
singular	feminine	-a	-u	-y	-e	-e	-oj
	masculine	-Ø	-Ø	-a	-u	-e	-om
plural	feminine	-y	-y	-Ø	-am	-ax	-ami
	masculine	-y	-y	-ov	-am	-ax	-ami

Context. Presenting case forms in isolation, we can test whether all oblique case forms rely equally on the context. Russian data is particularly suitable for resolving this issue, as there is a special case in Russian, namely locative (also called prepositional), which, unlike other cases, is always governed by a preposition. If the context is crucial for efficient oblique case recognition, locative wordforms should be processed longer compared to other oblique cases, since the latter do not need any preceding context on the left (e.g., if they occur at the beginning of a sentence). This hypothesis is partly supported by `vasilyevaEtAl2014`'s (`vasilyevaEtAl2014`) finding: masculine locative singular wordforms are processed as slowly as pseudowords with the same syllabic structure, and they are often qualified as nonwords. However, in the singular form, this processing cost could be caused by the homonymy of *-e* ‘LOC.MASC’ with *-e* ‘DAT/LOC.FEM’. If the effect is induced by the lack of prior preposition activation, locative plural processing should also be impaired. If locative plural processing is not more difficult than processing of other obliques, difficulty of masculine locative singular can not be explained by the absence of an appropriate preposition alone and, in general, the context-based hypothesis is not tenable.

Plural: case features vs. exponent frequency. As oblique plural exponents are non-ambiguous, these data are fruitful for exploring the role of case in nominal processing. If surface and lemma frequency are accounted for and differences in oblique case processing still arise, they could be attributed either to exponent

frequencies or to the set of grammatical features associated with the particular case. Frequency counts provided in **samojlova2014** frequencies suggest a hierarchy in (3a). Different approaches to Russian declension employ different sets of features and, thus, give conflicting predictions see (3b)–(3e), where we arrange oblique cases according to the number of positive features they express (as suggested by **clahsen2001** mental).

- (3) a. frequency: Gen < Ins < Loc < Dat (34% < 11% < 10.3% < 4.7%)
b. **muller2004decomposing**: Loc < Dat ≈ Ins < Gen ($\langle +\text{obl} \rangle < \langle +\text{obl}, +\text{gov} \rangle \approx \langle +\text{obl}, +\text{subj} \rangle < \langle +\text{obl}, +\text{gov}, +\text{subj} \rangle$)
c. **wiese2004categories**: Loc < Ins ≈ Dat ≈ Gen ($\langle +\text{obl} \rangle < \langle +\text{obl}, +\text{inst} \rangle \approx \langle +\text{obl}, +\text{dat} \rangle \approx \langle +\text{obl}, +\text{gen} \rangle$)
d. **wunderlich1996minimalist**: Gen < Dat < Loc < Ins ($\langle +\text{hr}_N \rangle < \langle +\text{hr}, +\text{lr} \rangle < \langle +\text{hr} \& \text{additional semantic features} \rangle < \langle \text{semantic features} \rangle$)
e. **caha2008case**: Gen < Loc < Dat < Ins

Zero oblique inflection. **gor2017processing**'s (**gor2017processing**) study demonstrated that oblique overt and zero inflection trigger similar processing costs. But their conclusion was based on the comparison of feminine *-Ø* 'GEN.PL' to masculine *-a* 'GEN.SG'. A comparison with masculine *-ov* 'GEN.PL' is needed to support their claim.

Nominative ambiguity. Feminine *-y* 'NOM.PL' coincides with 'GEN.SG'. According to the approach advocated by **kostic1991informational**, etc., such ambiguous wordforms should benefit from their wider syntactic distribution and be recognized faster than their unambiguous masculine counterparts *-y* 'NOM.PL'.

Singular: case syncretism. Even if we obtain no significant differences in plural oblique processing, differences in singular oblique processing might arise due to ambiguity. Comparing instrumental wordforms, which are non-ambiguous, to other obliques, we can determine how interparadigmatic and intraparadigmatic syncretism influences wordform recognition. Furthermore, comparisons of wordforms with the same exponents, but belonging to different inflectional classes might help to resolve the debates concerning accidental vs. non-accidental homonymy in Russian singular declension.

If the two *-u*-s are accidentally homonymous (**wiese2004categories**), 'ACC.FEM' is expected to be processed faster than 'DAT.MASC'. If the two *-e*-s are accidentally homonymous (**muller2004decomposing**), 'DAT./LOC.FEM' is expected to be processed faster than 'LOC.MASC'.

We also decided to compare *-e* 'DAT/LOC.FEM' to *-u* 'DAT.MASC'. If the dative reading is dominant for *-e*, there should be no difference between these two con-

ditions. Finally, we compared feminine and masculine instrumental wordforms. These endings are also used in adjectives of the respective gender, but their distribution is different: feminine *-oj* covers all oblique cases, while masculine *-om* is used in locative only. This difference might lead to an advantage of feminine instrumental over masculine instrumental.¹

Zero nominative inflection. Russian overt and non-overt nominative inflection (*-a* ‘NOM.FEM’ and *-Ø* ‘NOM.ACC.MASC’) was already compared in gor2017processing, and no difference was observed. However, their study employed an auditory lexical decision task, and it is unclear whether their results are modality-neutral.

3 Method

Participants. Ninety-six Russian native speakers, all right-handed (aged 17–25 years) were tested. Half of them participated in experiment 1, the other half in experiment 2.

Stimuli. We used all six case forms of inanimate nouns belonging to two declensional classes (54 feminine nouns ending in *-a* and 54 masculine nouns ending in *-Ø* matched for lemma frequency). All stimuli were base nouns, they did not undergo any stem alternations and had fixed stress on the stem (the 1a inflectional class according to *zaliznyak1977grammatical*). Length in nominative differed from 4 to 6 (each group comprised one third of words with each length). 108 nouns with pseudoendings and 108 inflected pseudostems served as nonwords. In experiment 1, nouns were presented in singular; in experiment 2, in plural. Latin-square design was employed with the number of lists corresponding to the number of case forms.

Procedure. Each participant was assigned to one of the six experimental lists and was tested individually. Experiments were run using DMDX software (Forster, Forster, 2003). Before the test phase (324 trials), participants received written instructions and performed a practice phase (20 trials). In each trial, participants had to decide whether the string of letters presented on the screen was a real Russian word or not. They were instructed to respond as fast and accurately as possible. Each trial started with a fixation sign (+) that was displayed on the screen for 600 ms. The stimulus remained on the screen until response or time-out (2500 ms). The interstimulus interval was set to 2500 ms.

Data analysis. We used linear mixed-effects modeling for the analysis of reaction times and logistic mixed regression for the accuracy data (baayen2008analyzing).

¹Since feminine genitive singular *-y* is homonymous with nominative plural, we did not compare it to the masculine genitive singular.

Statistical analysis was implemented in the package lme4 ([bates2014lme4](#)) in the statistical software R ([team2014r](#)). T -values, z -values, p -values, and standard errors were determined using the package lmerTest ([kuznetsova2015package](#)). Fixed and random effects were included only if they significantly improved the model fit in a backward stepwise model selection procedure. Models were selected using Chi-square log-likelihood ratio tests with regular maximum likelihood parameter estimation.

Subject and lexeme were treated as random effects. Lemma and wordform frequency, length in letters and syllables, mean Levenstein distance to the nearest 20 lexeme-neighbors, inflectional and relative entropy measures were additionally included as covariates.^{2,3,4} Trial order (z transformation on log numbers) was included to control for longitudinal task effects such as fatigue or habituation. All these covariates were log-transformed. To avoid multicollinearity, all counts except for trial were transformed into 5 principal components, explaining 93.5% of variance ([baayen2008analyzing](#)). The first principal component (PC1) captured orthographic characteristics of the stimulus. The second component (PC2) was inversely related to frequency. The third component (PC3) was inversely related to relative entropy and positively related to inflectional entropy. Paired contrasts were carried out in the package lsmeans ([lenth2016least](#)). For planned comparisons, FDR adjusted p -values are reported ([benjamini1995controlling](#)).

As our words were presented without context, case labels for ambiguous endings (feminine -*y* and -*e*, masculine -*y* and - \emptyset) are somewhat arbitrary. Hence, we do not expect any differences between feminine locative and dative -*e*, nor between masculine nominative and accusative - \emptyset . However, this is needed for counterbalancing issues, as patterns of syncretism do not coincide across our two noun groups. In the statistical analysis, the mean pooled over the two “conditions” will be used.

²Lemma frequency was taken from the frequency dictionary ([lyashevskaya2009frequency](#)). Wordform frequency was manually extracted from the main undisambiguated subcorpus of Russian national corpora ([www.ruscorpora.ru](#)); for ambiguous endings the cumulative frequency was taken, relying on [milin2009simultaneous](#)'s ([milin2009simultaneous](#)) experience.

To avoid zero frequencies, one was added to all counts, as suggested by [brysbaert2013dealing](#).

³The Levenstein distance was calculated in the vwr package ([keuleers2013vwr](#)) in the R software ([team2014r](#)).

⁴In order to calculate relative entropy, frequency of exponents was taken form the database created by [samojlova2014frequencies](#).

4 Results

Two participants in experiment 1 and two participants in experiment 2 gave fewer than 75% correct answers to word stimuli, so we recruited four additional people to replace them. We excluded from further statistical analysis two lexemes in experiment 1 and one lexeme in experiment 2 due to low mean accuracy score.

Reaction time (RT) data were analyzed as follows. Incorrect responses were removed from the analysis (7.1% of all data in experiment 1, 7.9% in experiment 2). Too fast (< 300 ms) or too slow responses (> 1 500 ms) were likewise excluded from further analysis. We applied log-transformation to reduce the positive skew. After that, remaining outliers were cut off via interquartile trimming.⁵ In sum, 3.9% of correct responses were removed in experiment 1 and 5.7% in experiment 2.

Raw RTs and error rates (ER) are presented in Table 2.

Table 2: Mean RT (in ms) and ER (in %) to feminine and masculine nouns in different cases and numbers (*SD* is provided in brackets)

		Nom	Acc	Gen	Dat	Loc	Ins
Experiment 1: singular							
f	RT	738 (181)	782 (198)	764 (195)	805 (203)	770 (194)	
	ER	1.7 (12.9)	4.8 (21.4)	4.6 (20.9)	9.3 (29)	3.9 (19.3)	
m	RT		719 (176)	838 (228)	799 (203)	850 (231)	803 (219)
	ER		2.3 (15)	8.3 (27.7)	6.3 (24.2)	20.8 (40.7)	2.3 (15.1)
Experiment 2: plural							
f	RT		818 (202)	894 (225)	900 (226)	873 (216)	894 (230)
	ER		4.6 (21)	22.4 (41.7)	7.5 (26.4)	8.5 (27.9)	7.3 (26.1)
m	RT		821 (196)	875 (209)	904 (235)	879 (212)	932 (234)
	ER		5.1 (22)	4.2 (20)	7.4 (26.2)	7.4 (26.2)	7.2 (25.8)

Final models for RTs and accuracy included the following factors: PC2, PC3, case, gender, a case by gender interaction and a PC3 by gender interaction. The model accounting for RTs in experiment 1 also included trial. All other predictors and interactions turned out to be insignificant. Full model specifications are

⁵We kept only those RTs, which satisfied the following formula $Q1 - (2.5 \times IQR) < RT < Q3 + (2.5 \times IQR)$, by participants, items (lexemes), gender and case (Q1 stands for first quartile, Q3 for third quartile, and $IQR = Q3 - Q1$ for interquartile range).

presented in the Appendix (see Table 5 for experiment 1 and Table 6 for experiment 2).

4.1 Experiment 1: Singular

Trial had a facilitative effect on RTs ($B = -0.012$, $t(4541) = -4.45$, $p < .001$). PC2 (inversely related to frequency) had a facilitative effect on RTs and accuracy rate ($B = 0.018$, $t(121) = 6.03$, $p < .001$, respectively and $B = -0.364$, $z = -5.86$, $p < .001$, respectively).

PC3 (entropy measures) affected differently the two types of nouns ($B = 0.024$, $t(103) = 3.2$, $p = .002$ and $B = -0.472$, $z = -3.628$, $p < .001$, respectively): there was a facilitation for feminine nouns ($B = -0.022$, $t(103) = -3.68$, $p < .001$ and $B = 0.509$, $z = 4.89$, $p < .001$, respectively) and no effect on masculine nouns ($B = 0.002$, $t(103) = 0.48$, $p = .633$ and $B = -0.11$, $z = 0.481$, $p = .631$, respectively).

Paired contrasts for different cases are summarized in Table 3 (for statistical details see Table 7). Apart from nominative vs. oblique differences, we observe differences between oblique case forms. Instrumental and the *-u* form ('ACC.FEM' and 'DAT.MASC') are "easy" obliques with faster responses and higher accuracy scores. The *-e* forms ('DAT/LOC.FEM' and 'LOC.MASC') constitute the "difficult" oblique group with slower responses and lower accuracy scores. Feminine genitive falls into the "easy" group, while masculine genitive patterns with the difficult *-e* 'LOC' form.⁶

Table 3: Experiment 1 (singular nouns): summary of paired contrasts analysis for feminine and masculine singular nouns in different cases

	RTs	accuracy
f	Nom < Ins ≈ Gen ≈ Acc < -e	Nom < Gen ≈ Acc < -e, Nom ≈ Ins, Gen ≈ Ins ≈ Acc, Ins < -e
m	-∅ < Ins ≈ Dat < Gen ≈ Loc	-∅ ≈ Ins < Dat ≈ Gen < Loc

In the analysis of accuracy, in contrast to the RT data, we fail to observe the nominative superiority over instrumental in any noun group. What is more, according to the accuracy analysis, masculine genitive yields higher accuracy rate than the masculine locative.

⁶In Table 3 and further "*<*" stands for significantly faster or significantly more accurate responses, "*≈*" stands for no significant difference.

Paired contrasts for gender (for statistical details see Table 7). There was no general gender effect either in the RT or accuracy analysis. Feminine -e forms ('DAT/LOC.FEM') are recognized faster and more accurately than masculine -e forms ('LOC.MASC'). Feminine instrumental wordforms are recognized faster than masculine ones, but there is no effect in the accuracy analysis. Feminine nominative is responded to slower than masculine -∅ forms ('NOM/ACC.MASC'); no effect shows up in the accuracy analysis. Feminine -e forms ('DAT/LOC.FEM') are recognized less accurately than masculine -u forms ('DAT.MASC'), but there is no significant difference in the RT analysis. There is no significant difference between feminine and masculine -u forms ('ACC.FEM' and 'DAT.MASC', respectively).

4.2 Experiment 2: Plural

PC2 (inversely related to frequency) had a facilitative effect on RTs and accuracy rates ($B = 0.019$, $t(126) = 4.98$, $p < .001$ and $B = -0.285$, $z = -4.21$, $p < .001$, respectively).

PC3 (entropy measures) affected differently the two types of nouns ($B = 0.021$, $t(107) = 2.28$, $p = .025$ and $B = -0.423$, $z = -2.727$, $p = .006$, respectively): there was a facilitation for feminine nouns ($B = -0.022$, $t(111) = -2.91$, $p = .004$ and $B = .442$, $z = 3.7$, $p < .001$, respectively), but no effect on masculine nouns ($B = -0.0004$, $t(101) = -0.06$, $p = .949$ and $B = 0.019$, $z = 0.19$, $p = .847$, respectively).

Paired contrasts for case are summarized in Table 4 (for statistical details see Table 8). According to the RT analysis, we observe a tripartite division of oblique forms: locative as the easiest, dative in the middle and instrumental as the most difficult. Genitive is recognized significantly faster than instrumental, but differs neither from locative, nor from dative.

In the accuracy analysis, only two contrasts are retained: between the -y form ('NOM/ACC') and instrumental and the difference between the -y form ('NOM/ACC') and genitive.

Table 4: Experiment 2 (plural nouns): summary of paired contrasts analysis for plural nouns in different cases

RTs	accuracy
$-y < \text{Loc} < \text{Dat} < \text{Ins}$,	$-y < \text{Gen} \approx \text{Ins}$
$\text{Gen} < \text{Ins}$,	$-y \approx \text{Loc} \approx \text{Dat}$
$\text{Gen} \approx \text{Loc}$, $\text{Gen} \approx \text{Dat}$	$\text{Loc} \approx \text{Dat} \approx \text{Gen} \approx \text{Ins}$

Paired contrasts for gender (see Table 7 for statistical details). There was no difference between two groups of nouns either in the RT or accuracy analysis. In genitive, feminine nouns have higher odds to be recognized incorrectly than masculine nouns; no significant difference shows up in the RT analysis. Feminine and masculine -y forms ('NOM/ACC') differ neither in the RT analysis, nor in the accuracy analysis.

5 Discussion

Results of our two experiments replicate the nominative/oblique dichotomy effect, previously reported for Russian and other languages (see §1). Apart from this trivial finding, we obtained several significant differences between oblique case processing both in singular and in plural. As we took into account lemma and surface frequency of a wordform, such oblique case processing differences should stem from the properties of the inflectional exponents.

Inflectional and relative entropy. We considered inflectional and relative entropy among potential covariates in the statistical analysis, as these factors were assumed to be highly predictive of nominal processing in Serbian (**milin2009simultaneous**). Prior to the analysis, we transformed our counts into principal components. PC3 capturing these two measures emerged in the statistical analysis of RTs and accuracy in both experiments. Unfortunately, the influence of PC3 was attested for feminine nouns only. The effect lies in the same direction as reported by **milin2009simultaneous**, but in the Serbian study masculine and feminine nouns were equally sensitive to entropy measures. However, to calculate the entropy values, they used frequencies of feminine exponents, as this inflectional class is assumed to be dominant in Serbian. In Russian, masculine -∅ nouns are slightly more frequent than feminine -a nouns (**samojlova2014frequencies**) and, thus, might be considered dominant. However, as the patterns of syncretism in these two noun groups do not coincide, we decided against using dominant class frequencies and employed feminine frequencies for feminine nouns and masculine frequencies for masculine nouns. This decision might be a possible reason for the observed discrepancies with **milin2009simultaneous**, but a more refined study is needed in order to make more solid conclusions.

Context: the locative issue. Initially, we hypothesized that if absence of context is an important source of oblique processing cost, preposition-less locatives should suffer the most, both in singular and in plural. Although masculine loca-

tive singular was one of the most difficult forms to recognize, plural locative was processed faster than all other obliques. Thus, we conclude that context-based explanations do not receive support at least for wordforms with non-ambiguous case markers. Influence of context on forms with ambiguous case exponents will be discussed below.

Plural. The hierarchy of plural case processing speed (4a) does not follow the order of exponent frequency: otherwise, instrumental would have been the easiest to process. So we can conclude that exponent frequency does not play a major role in the case form recognition. Nor does this hierarchy agree with the predictions derived from the frequency of exponents and feature sets proposed by muller2004decomposing; wiese2004categories; wunderlich2004there. Interestingly, it roughly resembles caha2008case's (caha2008case) nanosyntactic approach to Russian case, see (4b).

- (4) a. $-y < \text{Loc} < \text{Dat} < \text{Ins}$, $\text{Loc} \approx \text{Gen} \approx \text{Dat}$, $\text{Gen} < \text{Ins}$ (our data: exp. 2)
b. [Ins [Dat [Loc [Gen [Acc [Nom]]]]]]]

Here, the only diverging case is genitive. Unlike all other cases in plural, it is spelled out differently for our two target inflectional classes. Hence, at the checking or licensing stage (see, e.g., bertram2000role), which follows the decomposition of the wordform into morphemes, it is verified whether the inflectional class of the lexeme matches the inflectional class of the ending. For other oblique case forms, such a procedure is not needed, as they are uniform for both classes. As a consequence, we observe longer reaction times than those that could be expected if genitive plural meaning was expressed in only one way.

Zero oblique inflection. In line with gor2017processing, response latencies for the zero oblique \emptyset 'GEN.PL' did not differ significantly from the overt oblique $-ov$ 'GEN.PL'. Yet, the zero genitive yielded higher error rates than the overt genitive. We doubt that low accuracy stems from a greater processing cost associated with zero inflection compared to overt inflection, especially as this is not attested in the RT analysis. A more plausible source for the high error rate is homonymy. Feminine genitive plural wordforms having a phonologically null ending are ambiguous with the stem itself. This homonymy might lead to a competition in the recognition process: if the wordform reading wins, the correct answer is produced in the lexical decision task; if the stem reading wins, non-word answer is selected, as Russian does not allow for bare stems.

Nominative ambiguity. We failed to find evidence supporting the claim that the ambiguous feminine $-y$ 'NOM.PL'/'GEN.SG' is easier to be recognized than the

non-ambiguous masculine -y ‘NOM.PL’ due to its wider distribution.

Singular. In singular, the following generalization holds for both nouns:

- (5) Nom < Ins ~ -u < -e, , where -u corresponds to ‘ACC.FEM’/‘DAT.MASC’ and -e corresponds to ‘DAT/LOC.FEM’/‘LOC.MASC’

Instrumental. Instrumental singular wordforms, despite their relatively low frequency ([samojlova2014frequencies](#)), are one of the easiest obliques to be recognized due to their unambiguity. In §2, we hypothesized that feminine instrumental -oj could be processed faster than masculine instrumental -om due to their homonymy with adjectival endings, and this prediction was borne out. Masculine -om marks different cases in nouns and adjectives (‘INS’ vs. ‘LOC’, respectively), and this feature mismatch might negatively affect their processing. Feminine adjectival -oj, on the other hand, includes ‘INS’ as one of its possible interpretations; consequently, no conflict arises.

-U forms The -u forms (‘ACC.FEM’ and ‘DAT.MASC’) behave similarly to the unambiguous instrumentals, but this does not signify that their homonymy is accidental. The lack of significant difference in the processing speed of the two forms is compatible with the hypothesis of a shared underspecified representation, as suggested in [muller2004decomposing](#); [wunderlich2004there](#). However, this evidence is not enough to reject the accidental homonymy hypothesis. A better insight into this problem might be gained if we compare the processing of dative -u in the accusative environment and vice versa. If there is one shared representation for the two -u-s in the mental lexicon, such sentences, following [penke2004psycholinguistic](#); [opitz2013neurophysiological](#), should show reduced ungrammaticality effects, if any.

-E forms. The -e forms (‘DAT/LOC.FEM’ vs. ‘LOC.MASC’) are most difficult to process in both noun groups, triggering longer RTs and lower accuracy, masculine -e being even more difficult with the slowest reaction times and the highest error rates. Feminine -e is largely believed to have a shared semantic representation for its two interpretations ([muller2004decomposing](#); [wiese2004categories](#); [wunderlich2004there](#)). But a shared representation on its own is not a plausible source for such a processing cost. Masculine -e wordforms, on the contrary, are not ambiguous, but they are always governed by a preposition, and in the present study locatives were presented preposition-less in the experimental conditions. In experiment 2, locative plural, which is also preposition-dependent, actually, turned out to be one of the easiest oblique cases. Thus, absence of the preposition is not the main reason for poor participants’ performance on singular masculine

locatives.

We suggest that this finding could be accounted for in a model of Russian case where all -e-s have one shared representation. The features distinguishing between two cases compete with each other during wordform processing. Locative, as the more frequent reading (*samojlova2014frequencies*), has by default more weight, while dative gets more weight in the appropriate context, i.e. in the preposition-less environment. This competition slows down the recognition process. If we assume that the context cue prevails over the frequency cue, then for feminine nouns the dative reading succeeds. With masculine nouns, the context cue will lead to the incorrect selection of the dative features and cause non-word answers. The reanalysis of -e as ‘LOC’ is, thus, warranted. As any reanalysis, it requires additional time cost, which explains the superiority of feminine -e forms over masculine -e forms in the processing speed.

Genitive. Genitive wordforms behave differently in the two inflectional classes. Masculine genitive pattern together with the difficult -e in the RT analysis. Feminine genitive falls in the “easier” oblique group. Both genitive endings are homonymous: feminine genitive -y coincides with nominative plural, masculine genitive -a – with the feminine nominative -a.

As far as the masculine genitive -a is concerned, an analysis similar to the analysis of -e forms is plausible. Two -a-s (‘GEN.MASC’ and ‘NOM.FEM’) have a shared representation in the mental lexicon. In a context-less condition, the nominative reading is preferred. Shared representation for these morphemes was previously proposed by *muller2004decomposing; wunderlich2004there*. However, this analysis does not capture the fact that masculine genitive is processed more accurately than masculine locative.

As for feminine genitive in -y, the unanimous position (*muller2004decomposing; wunderlich2004there; wiese2004categories*) stands for accidental homonymy. Genitive singular -y is more frequent than nominative plural (*samojlova2014frequencies*). Thus, fullform storage is more likely for nominative plural, following the suggestion by *bertram2000role*. Fullform access is assumed to be faster than the decomposition route (i.e., *bertram2000role*), yet we do not have enough evidence to claim that our -y forms were always processed as nominative plurals. In the singular environment of experiment 1, the singular reading might be chosen due to interstimulus priming. Nevertheless, whichever interpretation is chosen, it is easier to process than the ambiguous -e.

Zero nominative inflection. The visual lexical decision task hints at a processing advantage for the phonologically non-overt inflection (-Ø ‘NOM/ACC.MASC’) over the phonologically overt inflection (-a ‘NOM.FEM’). This contrasts with the

null effect obtained previously in the auditory modality (gor2017processing); note that non-significant effects are actually misleading, as they do not allow to conclude anything. Strictly speaking, these two forms differ not only in phonological overtess, but also in ambiguity: the *-a* wordform is unambiguous, while the *-Ø* wordform also marks accusative in the discussed set of nouns. So this finding should be treated with caution.

6 Conclusion

The results of our two experiments disagree with previous findings in Finnish, Uyghur, and Serbian, suggesting that differences in oblique case processing exist. Moreover, these differences arise both in transparent systems of case marking (Russian plural) and opaque or highly syncretic systems of case marking (Russian singular).

Data from the experiment with plural nouns suggests that case processing might be guided by caha2008case's (caha2008case) functional case sequence. Results for singular nouns imply that different types of ambiguity are present in Russian declension. When the ambiguity is not accidental, context plays a major role in the selection of the interpretation.

Abbreviations

ACC	accusative	LOC	locative
DAT	dative	MASC	masculine
GEN	genitive	NOM	nominative
FEM	feminine	PL	plural
INS	instrumental	SG	singular

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Appendix A: Experimental items

Lemma frequency counts are given in brackets.

Feminine nouns (47.39)

anketa ‘questionnaire’ (14.4), *arfa* ‘harp’ (2.6), *astra* ‘aster’ (3.8), *aura* ‘aura’ (5.1), *beseda* ‘conversation’ (87.5), *bukva* ‘letter. character’ (63.5), *data* ‘date’ (49.5), *doza* ‘dose’ (22.4), *dyuna* ‘dune’ (2), *fleita* ‘flute’ (5.8), *gazeta* ‘newspaper’ (237.5), *gitara* ‘guitar’ (22.2), *kareta* ‘carriage’ (9.4), *karta* ‘map’ (103), *kassa* ‘cashier’s desk’ (20.9), *klumba* ‘flower-bed’ (8.7), *klyaksa* ‘blot’ (4.5), *kofta* ‘jacket’ (7.7), *lampa* ‘lamp’ (34), *lapa* ‘paw’ (39.7), *lenta* ‘ribbon’ (35.9), *lira* ‘lyre’ (8), *lyustra* ‘lustre’ (9.9), *mera* ‘measure’ (284.3), *minuta* ‘minute’ (344.2), *moneta* ‘coin’ (17.5), *norma* ‘norm’ (111.3), *orbita* ‘orbite’ (15), *pal’ma* ‘palm tree’ (14.3), *pasta* ‘paste’ (6.3), *pochva* ‘soil’ (56.2), *poza* ‘pose’ (29.8), *raketa* ‘rocket’ (62.9), *rama* ‘frame’ (21.2), *rana* ‘wound’ (29.4), *rasa* ‘race’ (5.9), *rifma* ‘rhyme’ (8.5), *roza* ‘rose’ (42.7), *shakhta* ‘pit’ (20.7), *shina* ‘tire’ (15.3), *shirma* ‘folding-screen’ (5.3), *shkola* ‘school’ (316), *shlyapa* ‘hat’ (34.2), *shuba* ‘furcoat’ (18.7), *shvabra* ‘mop’ (3.4), *summa* ‘sum’ (130.6), *trassa* ‘route’ (32.5), *travma* ‘trauma’ (19.6), *tsifra* ‘numeric’ (62.2), *tsitata* ‘citation’ (21.5), *tykva* ‘pumpkin’ (5), *vaza* ‘vase’ (14.3), *yakhta* ‘yacht’ (9.5), *yurta* ‘yurt’ (2.7)

Masculine nouns (47.37)

al’bom ‘album’ (23.7), *ananas* ‘pineapple’ (3.6), *aromat* ‘aroma’ (22.9), *aspekt* ‘aspect’ (35.6), *atom* ‘atom’ (20.5), *banan* ‘banana’ (7.3), *baton* ‘loaf (of bread)’ (5.3), *bufet* ‘buffet’ (20), *buton* ‘bud’ (4.6), *desert* ‘dessert’ (4), *diplom* ‘diploma’ (25.8), *divan* ‘sofa’ (60.1), *dzhip* ‘jeep’ (14.7), *fontan* ‘fountain’ (18.4), *frukt* ‘fruit’ (21.6), *gimm* ‘hymn’ (14.8), *ideal* ‘ideal’ (36), *kanat* ‘rope’ (9), *kapriz* ‘caprice’ (7.1), *kedr* ‘cedar’ (6.1), *khalat* ‘bathrobe’ (36.1), *klad* ‘treasure’ (7.5), *komod* ‘dresser’ (5.2), *kontur* ‘contour’ (15.3), *kostyum* ‘costume. suit’ (81.3), *kurort* ‘resort’ (12.8), *metall* ‘metal’ (57.5), *moment* ‘moment’ (306.8), *nrv* ‘temper’ (17.8), *ofs* ‘office’ (34.1), *period* ‘period’ (204.2), *plan* ‘plan’ (235.3), *pled* ‘plaid’ (4.8), *reis* ‘flight. voyage’ (22), *remont* ‘reparation’ (64.2), *ritm* ‘rhythm’ (30.6), *romb* ‘rhombus’ (1.8), *rulon* ‘roll’ (4.3), *servis* ‘service’ (14.6), *sezon* ‘season’ (69.2), *shram* ‘scar’ (10.7), *shtraf* ‘forfeit’ (32.3), *simvol* ‘symbol’ (46.4), *sous* ‘sauce’ (10.8), *syuzhet* ‘storyline’ (56.6), *teatr* ‘theater’ (305.3), *tekst* ‘text’ (146.2), *temp* ‘tempo’ (49), *tovar* ‘item of goods’ (115.5), *tsikl* ‘cycle’ (43.6), *virus* ‘virus’ (106.5), *vulkan* ‘volcano’ (6), *yarus* ‘tier. layer’ (6.5),

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zhanr ‘genre’ (36)

Appendix B: Results of statistical analyses

Table 5: Experiment 1 (singular nouns): final models for RTs and accuracy

		RTs				Accuracy			
<i>Random effects</i>									
Groups	Name	Variance	SD	(Intercept)	Name	Variance	SD	(Intercept)	
Subject	0.001	0.031			0.143	0.378			
Lexeme	0.027	0.163			0.96	0.98			
Residual	0.032	0.179							
<i>Fixed effects</i>		<i>B</i>	SE	df	<i>t</i> -value	Pr(> t)	<i>B</i>	SE	<i>z</i> -value
(Intercept)	6.58	0.026	64	257.46	<.001		4.71	0.414	11.4
Trial	-0.012	0.003	4541	-4.45	<.001				<.001
PC2	0.018	0.003	121	6.03	<.001	-0.364	0.062	-5.86	<.001
PC3	-0.022	0.006	103	-3.68	<.001	0.509	0.104	4.89	<.001
Case[Acc]	0.067	0.013	4538	5.22	<.001	-1.282	0.442	-2.9	.004
Case[Dat]	0.1	0.013	4490	7.7	<.001	-1.906	0.417	-4.57	<.001
Case[Gen]	0.048	0.013	4565	3.72	<.001	-1.356	0.445	-3.05	.002
Case[Ins]	0.042	0.013	4472	3.32	.001	-0.952	0.454	-2.1	.036
Case[Loc]	0.089	0.013	4488	6.82	<.001	-2.07	0.413	-5.02	<.001
Gender[m]	-0.023	0.014	816	-1.63	.104	0.001	0.536	0.003	.998
Case[Acc] : Gender[m]	-0.077	0.018	4510	-4.32	<.001	0.655	0.643	1.02	.308
Case[Dat] : Gender[m]	-0.0005	0.018	4521	-0.027	.979	0.503	0.594	0.847	.397
Case[Gen] : Gender[m]	0.100	0.018	4514	5.56	<.001	-0.545	0.607	-0.898	.369
Case[Ins] : Gender[m]	0.056	0.018	4470	3.13	.002	0.539	0.667	0.808	.419
Case[Loc] : Gender[m]	0.082	0.019	4493	4.38	<.001	-0.915	0.571	-1.6	.109
PC3 : Gender[m]	0.024	0.008	103	3.2	.002	-0.472	0.13	-3.63	<.001

Table 6: Experiment 2 (plural nouns): final models for RTs and accuracy

		RTs				Accuracy			
<i>Random effects</i>									
Groups	Name	Variance	SD	(Intercept)	Name	Variance	SD	(Intercept)	
Subject	0.002	0.041			(Intercept)	0.323	0.569		
Lexeme	0.021	0.145			(Intercept)	0.612	0.782		
Residual	0.035	0.188							
<i>Fixed effects</i>									
	B	SE	df	t-value	Pr(> t)	B	SE		z-value
(Intercept)	6.68	0.024	76	279.9	<.001	3.265	0.271	12.03	<.001
PC2	0.019	0.004	126	4.98	<.001	-0.285	0.068	-4.21	<.001
PC3	-0.022	0.007	111	-2.91	.004	0.442	0.12	3.7	<.001
Case[Acc]	0.034	0.013	4342	2.52	.012	0.205	0.332	0.618	.537
Case[Dat]	0.094	0.014	3769	6.49	<.001	-0.109	0.3	-0.364	.716
Case[Gen]	0.087	0.015	3645	5.76	<.001	-1.505	0.268	-5.61	<.001
Case[Ins]	0.103	0.014	4419	7.42	<.001	-0.385	0.294	-1.31	.191
Case[Loc]	0.067	0.014	4311	4.77	<.001	-0.345	0.292	-1.18	.237
Gender[m]	0.017	0.016	589	1.06	.288	0.179	0.345	0.52	.603
Case[Acc] : Gender[m]	-0.046	0.019	4342	-2.41	.016	-0.481	0.455	-1.06	.29
Case[Dat] : Gender[m]	-0.011	0.019	4437	-0.58	.565	-0.357	0.42	-0.85	.395
Case[Gen] : Gender[m]	-0.026	0.020	4269	-1.29	.197	1.534	0.428	3.58	<.001
Case[Ins] : Gender[m]	0.015	0.019	4391	0.76	.448	-0.183	0.42	-0.44	.662
Case[Loc] : Gender[m]	-0.010	0.019	4426	-0.53	.594	-0.143	0.415	-0.34	.731
PC3 : Gender[m]	0.021	0.009	107	2.28	.025	-0.423	0.155	-2.73	.006

Table 7: Experiment 1 (singular nouns): paired contrasts for feminine and masculine nouns in different cases (analyses with $p \leq .05$ are given in bold)

				RTs				accuracy		
				Δ	df	t	p	Δ	z	p
f	Nom	vs.	Gen	-0.048	4565	-3.72	<.001	1.356	3.05	.006
			Acc	-0.067	4538	-5.22	<.001	1.282	2.9	.008
		-	Ins	-0.042	4472	-3.32	.002	0.952	2.1	.055
			-e	-0.094	4495	-8.44	<.001	1.99	5.02	<.001
	Gen	vs.	Acc	-0.019	4497	-1.48	.174	-0.074	-0.22	.836
			Ins	0.006	4565	0.47	.666	-0.404	-1.16	.321
			-e	-0.046	4561	-4.06	<.001	0.633	2.36	.032
	Acc	vs.	Ins	0.025	4516	1.95	.07	-0.33	-0.96	.421
			-e	-0.027	4503	-2.38	.027	0.708	2.68	.015
	Ins	vs.	-e	-0.052	4476	-4.65	<.001	1.037	3.65	.001
m	-	-	Gen	-0.154	4505	-13.8	<.001	1.587	5.39	<.001
			Dat	-0.104	4524	-9.42	<.001	1.089	3.54	<.001
			Ins	-0.103	4472	-9.53	<.001	0.1	0.25	.836
			Loc	-0.176	4491	-14.69	<.001	2.675	9.98	<.001
	Gen	vs.	Dat	0.049	4557	3.77	<.001	-0.499	-1.85	.092
			Ins	0.051	4494	3.98	<.001	-1.488	-4.1	<.001
			Loc	-0.022	4514	-1.6	.141	1.088	4.95	<.001
	Dat	vs.	Ins	0.002	4506	0.13	.899	-0.989	-2.64	.015
			Loc	-0.071	4498	-5.2	<.001	1.586	6.65	<.001
	Ins	vs.	Loc	-0.073	4483	-5.41	<.001	2.575	7.54	<.001
f	vs.	m		-0.005	100	-0.59	.608	-0.035	-0.21	.836
Ins	f vs. m			-0.034	830	-2.4	.027	-0.534	-1.29	.27
$-u_f$	$-u_m$			-0.01	836	-0.7	.548	0.125	0.39	.786
$-e_f$	$-e_m$			-0.054	739	-3.99	<.001	1.004	5.14	<.001
$-e_f$	$-u_m$			0.017	589	1.31	.226	-0.583	-2.34	.032
$-a_f$	$-\emptyset_m$			0.027	551	2.16	.045	0.318	0.71	.566

Table 8: Experiment 2 (plural nouns): paired contrasts for feminine and masculine nouns in different cases (analyses with $p \leq .05$ are given in bold)

			RTs				accuracy		
			Δ	df	t	p	Δ	z	p
$-y$	vs.	Gen	-0.068	4096	-7.7	<.001	0.72	4	<.001
		Dat	-0.082	3367	-9.26	<.001	0.27	1.51	.245
		Ins	-0.105	4400	-12.39	<.001	0.459	2.62	.038
		Loc	-0.056	4134	-6.48	<.001	0.399	2.29	.058
Gen	vs.	Dat	-0.014	4409	-1.41	.229	-0.45	-2.38	.057
		Ins	-0.036	4439	-3.58	.001	-0.261	-1.36	.251
		Loc	0.012	4380	1.25	.276	-0.321	-1.72	.186
Dat	vs.	Ins	-0.022	4290	-2.2	.046	0.189	0.98	.424
		Loc	0.026	4390	2.71	.013	0.129	0.7	.575
Ins	vs.	Loc	0.049	4440	4.9	<.001	-0.06	-0.32	.785
f	vs.	m	-0.005	102	-0.48	.686	-0.232	-1.4	.251
$-y$	f vs. m		-0.005	255	-0.4	.692	0.07	0.27	.785
	Gen	f vs. m	0.008	644	0.49	.686	-1.704	-5.68	< .001

Chapter T

A puzzle about adverbials in simultaneous readings of present and past-under-past in Russian

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The present and past tense can both get the simultaneous interpretation in complement clauses when they are embedded under the past tense in Russian. However, I observe that the adverbials that are allowed with present tense in such contexts (for example, *sejčas* ‘now’) are not allowed with the past tense and vice versa (for example, *togda* ‘then’ is not allowed with the present). I show that simply restricting the meaning of those adverbials does not help due to the fact that tenses can be interpreted *de re*. In *de re* construals, tenses are interpreted outside of the clause they originate in, so no meaning conflict between the tense and the adverbial in the embedded clause is predicted. I propose that when a tense is interpreted *de re*, an adverbial has to be interpreted *de re* together with it. I show that under this assumption the observed restriction follows in a direct way.

Keywords: present tense, past tense, past-under-past, present-under-past, *de re*, attitude reports, temporal adverbials

1 Introduction

1.1 Simultaneous readings of present-under-past and past-under-past in Russian

In this paper I will discuss simultaneous readings that the present tense and the past tense can receive in complement clauses embedded under the past tense in Russian. I will point out that there are some restrictions on adverbials that can occur in such clauses and I will attempt to explain those restrictions.

In Russian, the simultaneous reading of past tense in a complement clause embedded under past tense in a main clause is in principle available (Altshuler 2008). Usually, the simultaneous reading is not the most salient one. For example, the most salient reading of the sentence in (1), is the back shifted reading: according to Tanja, Putin was a president some time in the past with respect to 2016, the time when she pronounced the sentence.¹

- (1) V 2016 godu Tanja skazala, čto Putin byl prezidentom Rossii.
in 2016 year Tanja say.PAST that Putin be.PAST president.INST Russia.GEN
'In 2016 Tanja said that Putin was the president of Russia.'

The simultaneous reading of past-under-past in (1) can be enforced by some adverbials, such as *togda* 'then'.² In (2) *togda* anaphorically refers to 2016 and the interpretation where the event of saying and the state of being the president of Russia overlap in time becomes the most salient.

- (2) V 2016 godu Tanja skazala, čto togda Putin byl prezidentom
in 2016 year Tanja say.PAST that then Putin be.PAST president.INST
Rossii.
Russia.GEN
'In 2016 Tanja said that Putin was the president of Russia then.'

Like Hebrew (OgiharaSharvit2012), Russian also has a relative present tense. For example (3), where the verb in the embedded clause has the present tense features and the verb in the main clause has the past tense features, expresses the idea that Tanja said that Putin was president at the time when she pronounced the words 'Putin is the president'.³

- (3) V 2016 godu Tanja skazala, čto Putin Ø prezident Rossii.
in 2016 year Tanja say.PAST that Putin be.PRES president.NOM Russia.GEN
'In 2016 Tanja said that Putin was the president of Russia.'

1.2 The adverbial puzzle

Past-under-past and present-under-past in Russian both seem to be able to express the simultaneity of the time of the eventuality described by a complement

¹The Russian judgment reported in this paper are my own judgments confirmed with other native speakers of Russian.

²In this respect, Russian behaves like Hebrew, as it was reported in OgiharaSharvit2012.

³Note that present tense copula (indicated by Ø and glossed as be.PRES) is silent in Russian.

clause and the time when the embedded claim was made. However, even though *togda* really enforces the simultaneous reading of past-under-past as we saw in (2), it is completely unacceptable in a complement clause with the present tense embedded under the past tense; a relevant example is given in (4).⁴

- (4) # V 2016 godu Tanja skazala, čto Putin togda Ø president
 in 2016 year Tanja say.PAST that Putin then be.PRES president.NOM
 Rossii.
 Russia.GEN

Intended: ‘In 2016 Tanja said that Putin was the president of Russia then.’

If past-under-past and present-under-past can get the same interpretation, why is *then* possible in the embedded clause in the first case, but not in the second?

On the other hand, there are some adverbials, such as *sejčas* ‘now’, that are compatible with present-under-past in Russian (5), but not with past-under-past (6). Thus, the presence of *sejčas* in (6) makes it ill-formed, whereas without *sejčas* both sentences (5) and (6) can have the simultaneous reading.⁵

- (5) Kogda ja govorila s nej tri goda nazad, Tanja skazala, čto ona
 when I talk.PAST with her three years ago Tanja say.PAST that she
 (sejčas) Ø beremenna.
 now be.PRES pregnant

‘When I talked to her three years ago, Tanja told me that she was pregnant (at that time).’

- (6) Kogda ja govorila s nej tri goda nazad, Tanja skazala, čto ona
 when I talk.PAST with her three years ago Tanja say.PAST that she
 byla (#sejčas) beremenna.
 be.PAST now pregnant
 (Intended:) ‘When I talked to her three years ago, Tanja told me that she was pregnant (at that time).’

This is the adverbial puzzle that I will address in this paper. The fact that not all tenses are compatible with all adverbials has been previously noticed in the literature (for example, see the discussion in Hornstein 1990). What is special about the

⁴The symbol # is used, when the sentence or expression is ill-formed due to meaning.

⁵I do not translate (5) into English as ‘When I talked to her 3 years ago, Tanja told me that she is pregnant now’ because this English sentence does not have the relevant reading due to the fact that there is no relative present in English and *now* is indexical, unlike *sejčas* ‘now’.

embedded contexts considered here is that past-under-past and present-under-past seem to be able to contribute the same meaning. Thus, it is not clear why there would be a meaning clash between an adverbial and the tense in one case but not in the other. Moreover, as I show in this paper, *togda* is an anaphoric element, and as such, it can pick different time intervals. There are many adverbials that denote a specific time interval and that are compatible with the present tense. However, there is something about the meaning of *togda* that makes it impossible for this element to pick the time intervals denoted by those adverbials. Another novel, to my knowledge, observation that I make in this paper is that the fact that *togda* and *sejčas* are distributed the way they are in the embedded contexts is not predicted by the existing theories of embedded tenses.

The discussion will go as follows. In §2 I will show that *togda* ‘then’ does not require past tense. Then I will provide the semantics of *togda* that accounts for the restriction on its use with present tense in Russian. I will suggest that *togda* carries a presupposition that the time intervals it picks are not equal to the evaluation time and will show how this presupposition accounts for the observed restrictions.

I will introduce my assumptions about the structure of the embedded clauses and the relative present in Russian and will show how the semantics of *togda* presented here correctly predicts the restrictions on its use in embedded contexts.

For the simultaneous reading of past-under-past I will adopt the classical *de re* approach (Abusch 1997; Heim 1994). I will show that the presupposition of *togda* that I am introducing is weak enough to make it compatible with the simultaneous reading of past-under-past.

In §3 I will show that the *de re* analysis of the simultaneous reading of past-under-past incorrectly predicts that Russian *sejčas* ‘now’ should be able to appear in such a context. Since under the *de re* analysis the tense moves out of the embedded clause and is interpreted separately from the adverbial, no meaning clash is predicted between the past tense and the present-oriented adverbial *sejčas*. I will propose that this problem can be solved if we adopt an assumption that a tense and an adverbial are interpreted together. Since, when past tense gets the simultaneous reading under past in believe/say contexts, it is interpreted outside of the embedded clause, the adverbial *sejčas* has to be interpreted outside of the embedded clause as well.

In §4 I will show that a similar problem arises in English *then* is predicted to be compatible with the *de re* interpretation of the present tense (which derives the so-called double access reading). §5 summarizes the findings.

2 Why *togda* is not compatible with the present tense

2.1 *Togda* is not compatible with the present tense in matrix and embedded contexts

Togda is an anaphoric element, in the sense that it makes a reference to a time interval that has been mentioned in the previous discourse. Thus in (7), it makes reference to the interval picked by *v prošlom godu* ‘last year’. In (8) it is anaphoric to the future time interval, the interval picked by *čerez tri goda* ‘in three years’.

- (7) V prošlom godu moj syn byl v pervom klasse. Togda on
in last year my son be.PAST in first grade then he
učilsja čitat'.
learn.PAST.REFL read.REFL

‘Last year my son was in the first grade. He was learning to read then.’

- (8) Čerez tri goda moj syn pojdet v pervji klass. Togda on
in three years my son go.FUT in first grade then he
naučitsja čitat'.
learn.FUT.REFL read.REFL

‘In three years my son will be in the first grade. He will learn to read then.’

However, example (9), where *togda* ‘then’ appears in a clause with present tense, is not acceptable. The reason for this must be that *togda* cannot pick the time interval denoted by *v étom godu* ‘this year’.

- (9) V étom godu moj syn Ø vo vtorom klasse. On izučaet
in this year my son be.PRES in second grade he study.PRES
matematiku (#togda).
math then

(Intended:) ‘This year my son is in the second grade. He studies math
(this year).’

There is some general principle that restricts the use of adverbials with the present tense both in English and in Russian. For example, the sentence in (10) does not mean that I am running now and it is 5am now.⁶ It is felicitous only on the planned future interpretation.⁷

⁶See Kamp-Reyle 1993 for a pragmatic explanation for this fact.

⁷As an anonymous reviewer points out, those sentences can be used felicitously with the present tense interpretation in some contexts. For example, (10) can be used if the previous discourse was ‘No one believed that I will start running, but here I am, running at 5am’.

- (10) # Ja begu v pjat' utra.
I run.PRES in five morning
Intended: 'I am running now and it is 5am.'
- (11) # Putin Ø president v 2018 godu.
Putin be.PRES president in 2018 year
Intended: 'Putin is president now and it is 2018.'

I would like to leave this more general problem out of the scope of the discussion here. In order to do so, I will compare *togda* with those adverbials that are completely compatible with the present tense.

One example of such adverbial is 'this year', as shown in (9). The question I will be focusing on is why in sentences like (9) *togda* cannot pick the same time interval as the one denoted by 'this year' and be compatible with the present tense given that it can easily pick the interval denoted by 'last year' in (7) and 'in three years' in (8).

We can see from the well-formedness of (12), where 'this year' occurs in the embedded clause (with the embedded present tense) and is anaphoric to '2016' of the main clause, that *v étom godu* 'this year' in Russian can pick a year that is current with respect to the local evaluation time (Tanja's 'now' at the time when she said those words).

- (12) V 2016 godu Tanja skazala mne, čto v étom godu ee syn ležit v
in 2016 year Tanja say.PAST me that in this year her son lie.PRES in
bol'nice.
hospital
'In 2016 Tanja told me that that year her son was in the hospital.'

In (13) *v étom godu* 'this year' occurs in the main clause and the sentence without *togda* has the simultaneous reading. The presence of *togda* makes this sentence ill-formed. Since *v étom godu* 'this year' is perfectly compatible with the present tense (embedded, as in (12) and unembedded, as in (14)), the badness of *togda* in (13) must be due to the fact that it somehow cannot refer to this interval.

- (13) Ja govorila s Tanej v étom godu I ona skazala mne, čto ee syn
I talk.PAST with Tanja in this year and she say.PAST me that her son
(#*togda*) vse ešče ležit v bol'nice.
then all still lie.PRES in hospital
(Intended:) 'I talked with Tanja this year and she told me that her son was
still in the hospital (then).'

- (14) Tanin syn v étom godu vse ešče ležit v bol'nice.
 Tanja's son in this year all still lie.PRES in hospital
 'Tanja's son is still in hospital this year.'

In principle, *togda* can pick an interval that is inside the interval denoted by 'this year' as it is shown in (15), where it occurs with the past tense embedded under past. In (15) *togda* anaphorically refers to the time when Tanja pronounced the words.

- (15) Ja govorila s Tanej v étom godu i ona skazala mne, čto ee syn
 I talk.PAST with Tanja in this year and she say.PAST me that her son
 togda vse ešče ležal v bol'nice.
 then all still lie.PAST in hospital
 'I talked to Tanja this year and she told me that her son was still in the
 hospital then.'

The question I will address here is why *togda* cannot denote a time interval that is compatible with present tense.

2.2 *Togda* does not require past tense

I will start this discussion by ruling out the simple idea that Russian *togda* requires past tense in the same clause to be licensed. One implementation of such an idea would be that *togda* has to agree with past tense and the agreement relation can only be established locally.

In Russian, there are several adverbials that have a meaning similar to *togda* and can occur in subordinate clauses with past tense embedded under past. They are listed in (16). The fact that all of them are good with past-under-past is shown in (17).

- (16) v to vremja / v tot moment / na tot moment
 in that time in that moment on that moment
 'at that time' / 'at that moment' / 'by that moment'
- (17) Ja govorila s Tanej v étom godu i ona skazala mne, čto ee syn
 I talk.PAST with Tanja in this year and she say.PAST me that her son
 {v to vremja / v tot moment / na tot moment} ležal v bol'nice.
 in that time in that moment on that moment lie.PAST in hospital
 'I talked to Tanja this year and she told me that her son was in the
 hospital {at that time / at that moment / by that moment}'

All of them are infelicitous with present tense embedded under past, as it is shown in (18).

- (18) # Ja govorila s Tanej v ètom godu i ona skazala mne, čto ee
I talk.PAST with Tanja in this year and she say.PAST me that her
syn {v to vremja / v tot moment / na tot moment} ležit v
son in that time in that moment on that moment lie.PRES in
bol'nice.
hospital

Intended: ‘I talked to Tanja this year and she told me that her son was in the hospital {at that time / at that moment / by that moment}’.

A strong argument against the hypothesis that all of those elements have to be licensed by past tense comes from the fact that all of them are in fact compatible with future tense in the same clause. One example where *togda* occurred in a matrix clause with a future tense was given in (8). In (19) I show that all of the adverbials given in (16) are compatible with an embedded future. The antecedent for *togda* or *na tot moment* ‘at that moment’ in (19) is given in a previous sentence and the resulting sentence is well-formed.

- (19) My obsuždali 2019 god. Tanja skazala, čto {na tot moment / v tot
we discuss.PAST 2019 year Tanja say.PAST that on that moment in that
moment / togda} Medvedev budet prezidentom.
moment then Medvedev be.FUT president.INST
‘We discussed 2019. Tanja said that {by that moment / at that moment /
then} Medvedev would be the president.’

We can conclude that it is not the case that *togda* (as well as other anaphoric elements that are compatible with past-under-past and incompatible with present-under-past) needs to be licensed by the past tense in the same clause.

2.3 The semantics of *togda*

I suggest that *togda* has the semantics given in (20). *Togda* carries an index that is mapped to a contextually given time interval (an interval *togda* is anaphoric to). It denotes a function of type $\langle i, t \rangle$: a function that takes a time interval and returns truth if that interval surrounds the contextually given time (translating this into the set-talk: it denotes a set of time intervals that surround the contextually given interval). The key part of this semantics is the presupposition that *togda* carries:

the time intervals it picks cannot be equal to the evaluation time with respect to which *togda* is interpreted.

$$(20) \quad [\![\text{togda}_5]\!]^{w,t,g,c} = \lambda t' : t' \neq t . g(5) \subseteq t'$$

A stronger presupposition that would also prevent *togda* from picking the time interval denoted by ‘this year’ would be that the time interval it picks does not overlap with the evaluation time. However, this would incorrectly predict that *togda* is incompatible with the simultaneous reading of past-under-past.

Let us consider what happens if we try to make *togda* to be anaphoric to the time interval denoted by ‘this year’. The index 5 is mapped to the year long interval surrounding the evaluation time.

$$(21) \quad g(5) = \text{the year of } t$$

Given those assumptions, the resulting meaning of *togda* with the index 5 is given in (22).

$$(22) \quad [\![\text{togda}_5]\!]^{w,t,g,c} = \lambda t' : t' \neq t . \text{the year of } t \subseteq t'$$

If we put together the semantics of *togda* given in (22) and present tense in a matrix context we will get a contradiction.

I will demonstrate this on the example of the second sentence of (9) that is given here separately as (23). The LF for it is given in (24).

- (23) On izučaet matematiku (#togda)
 He study.PRES math then
 (Intended:) ‘He studies math (now).’

$$(24) \quad [\![\text{IP} [\![\text{I PRES}_4]\!] [\![\text{vP}' [\![\text{AdvP togda}_5]\!] [\![\text{vP he}_7 [\![\text{VP studies math}]\!]]]\!]]]$$

I will assume that VPs like ‘studies math’ denote functions of type $\langle e, \langle i, t \rangle \rangle$. Thus, the vP gets the denotation of type $\langle i, t \rangle$. Let’s assume that the assignment function *g* maps the index 7 to John.

$$(25) \quad [\![\text{vP}_{(24)}]\!]^{w,t,g,c} = \lambda t' . \text{John studies math at } t'$$

Since temporal adverbials like *togda* also denote functions of type $\langle i, t \rangle$ (predicates of times), they can combine with vPs via predicate modification. The result of this is given in (26).

$$(26) \quad [\![\text{vP}'_{(24)}]\!]^{w,t,g,c} = \lambda t' : t' \neq t . \text{the year of } t \subseteq t' \& \text{John studies math at } t'$$

I will adopt the pronominal semantics for tenses (Partee 1973). Tenses carry indices, thus, like other pronouns, they get their denotation via the assignment function g . The semantics for present tense that I will assume is given in (27). It simply denotes a specific time interval and presupposes that this time interval is equal to the evaluation time.

- (27) $\llbracket \text{PRES}_4 \rrbracket^{w,t,g,c} = g(4)$
 $\llbracket \text{PRES}_4 \rrbracket^{w,t,g,c}$ is only defined if $g(4) = t$

The predicate of times in (26) combines with the present tense via function-argument application. The predicted denotation for (24) is given in (28). *Togda* carries a presupposition that the time intervals it selects are not equal to the evaluation time. Present tense carries a presupposition that the time interval it denotes is equal to the evaluation time. What follows from this is that when *togda* and the present tense combine there will be a contradiction. This accounts for the infelicity of *togda* with present tense in matrix contexts.

- (28) $\llbracket \text{IP}_{(24)} \rrbracket^{w,t,g,c} = \top$ iff John studies math at $g(4)$ and the year of $t \subseteq g(4)$
 $\llbracket \text{IP}_{(24)} \rrbracket^{w,t,g,c}$ is defined only if $g(4) = t$ and $g(4) \neq t$

Note that nothing prevents *togda* from picking a time interval within the current year as long as it is in the past or future with respect to the evaluation time. This is a good prediction because we still want to account for the well-formedness of (15).

The contradiction is predicted to arise when *togda* is used in embedded clauses with the present tense as well.

In languages where present-under-past can get the simultaneous reading, it is standardly interpreted as a relative present: a tense that denotes a local evaluation time (OgiharaSharvit2012; Ogihara 1989; von Stechow 1995).

The denotation for the relative present is given in (29): essentially it has the same denotation as the regular present in Russian.

- (29) $\llbracket \text{PRES-REL}_1 \rrbracket^{w,t,g,c} = g(1)$
 $\llbracket \text{PRES-REL}_1 \rrbracket^{w,t,g,c}$ is only defined if $g(1) = t$

I will make the following assumptions about the structure and the interpretation of embedded clauses in belief reports. Intensional verbs are quantifiers over world-time pairs. The intensional verb ‘say’ combines with its complement clause via a version of the rule of Intensional Functional Application (Heim-Kratzer1998). An intension of an expression XP is computed as shown in (30).

- (30) $\lambda w' \lambda t' . [[XP]]^{w', t', g, c}$

I will make my point by using the example given in (31). The LF for the embedded clause is given in (32). For the simplicity of exposition, I reconstructed the subject to its base-position.

- (31) Tanja skazala mne v ètom godu, čto ee syn (#togda) ležit v
 Tanja say.PAST me in this year that her son then lie.PRES in
 bol'nice.
 hospital

(Intended:) ‘Tanja told me this year that her son was in the hospital (at that time).’

- (32) $[_{IP} [_I \text{ PRES-REL}_1] [_{vP'} [_{\text{AdvP}} \text{ togda}_5] [_{vP} \text{ her}_7 \text{ son be in hospital}]]]$

With these assumptions, I predict that the embedded clause with *togda* in our problematic sentence (31) will have the intension given in (33).

- (33) $\lambda w' \lambda t' : t' \neq t'. \text{Tanja's son is in hospital in } w' \text{ at } t' \& \text{ the year of } t' \subseteq t'$

This intension includes a contradictory presupposition, thus the infelicity of *togda* is predicted.

One natural question arising at this point is whether the presence of this presupposition is predicted to block the use of *togda* in simultaneous reading of past-under-past as well because this would not be the desired result, as the well-formedness of (2) shows. This is the question I will address in the next subsection.

2.4 *Togda* and the simultaneous reading of past-under-past in Russian

In order to account for the restriction on the use of *togda* with embedded and matrix present tense in Russian, I suggested that *togda* in Russian comes with a presupposition that the time intervals it picks are not equal to the local evaluation time.

The simultaneous reading of past-under-past in complement clauses in principle can be derived at least in two ways. One option is a past tense deletion rule. In this system, the past features on the embedded past are not interpreted and an embedded past is interpreted as a relative tense (Ogihara 1989; 1995). A relative tense is interpreted as a local evaluation time, thus, in this system, given the definition I proposed for *togda*, *togda* is predicted to be infelicitous with the simultaneous reading of the past tense.

But this is not the only way past tense could get the simultaneous interpretation. Another standardly assumed way of deriving the simultaneous reading is the *de re* construal (OgiharaSharvit2012; Abusch 1997; Heim 1994). In what follows I will introduce the classic analysis of the *de re* construal and I will show that the presupposition of *togda* that I am proposing is not predicted to be in a conflict with the simultaneous reading of past-under-past in complement clauses.

Thus, I will assume that when *togda* is acceptable with the simultaneous reading of past-under-past, the simultaneous reading is derived via the *de re* construal.

I will show how the system works by using example (2), repeated here as (34).

- (34) V 2016 godu Tanja skazala, *čto togda Putin byl prezidentom*
in 2016 year Tanja say.PAST that then Putin be.PAST president.INST
Rossii.
Russia.GEN

‘In 2016 Tanja said that Putin was the president of Russia then.’

Abusch proposed to extend the *de re* analysis for singular terms developed by Kaplan (1969), Lewis (1979) and Cresswell-vonStechow1982 to the analysis of tenses in intensional contexts. In my exposition of the temporal *de re* construal I will use Cable’s (2015) exposition of this system, which relies on Heim’s (1994) implementation.

The past tense undergoes movement within the lower clause, leaving a trace t_4 and triggering lambda abstraction, indicated by 4 in Figure 1. The result of this movement is a predicate of times in the embedded clause.

After that, the past tense undergoes another short movement that is called the res-movement (Heim 1994). This type of movement is special because the moved element does not leave a trace and does not move to a c-commanding position.⁸ It moves to the position of the sister of the verb *say*. Thus, this tense will be interpreted outside of the clause where it originates.

Intensional verbs like *say* are ambiguous between their regular denotation and the denotation given in (35).

⁸Due to those properties res-movement is highly controversial from the syntactic perspective. There is a less controversial way of deriving *de re* readings (developed for individual arguments) via concept generators that was proposed by PercusSauerland2003.

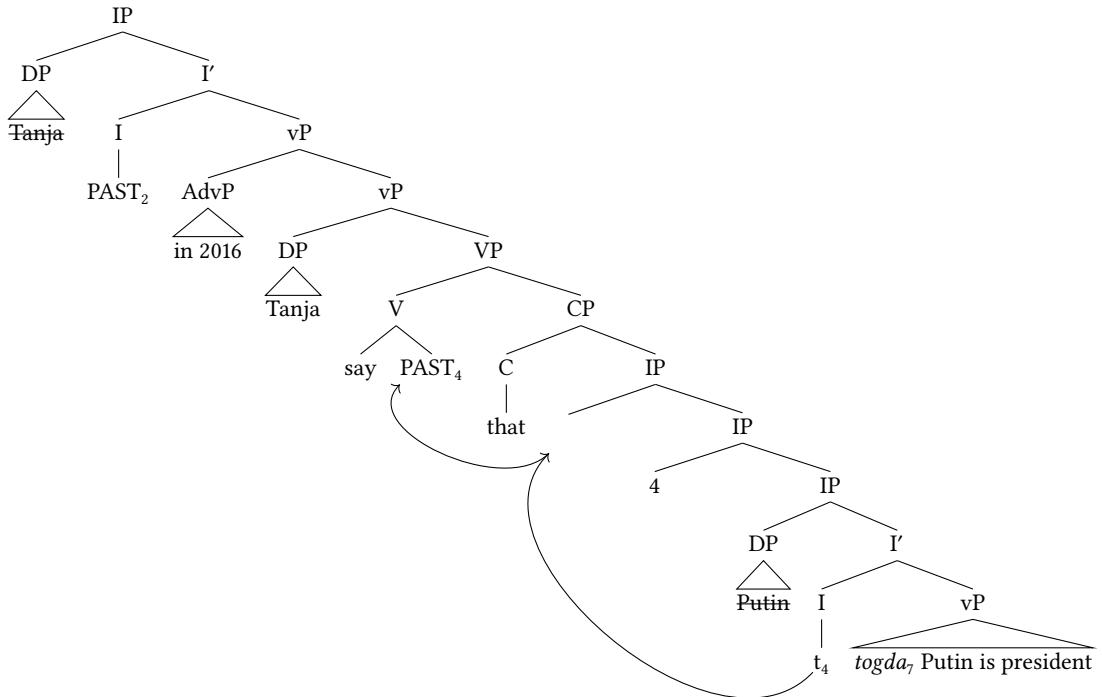


Figure 1: LF of (34)

(35) $\llbracket \text{say} \rrbracket^{w,t,g,c} =$

λt_i the object of belief (res)

$\lambda Q_{\langle s, \langle i, \langle i, t \rangle \rangle \rangle}$ the intension of the predicate of times

λy_e the attitude holder

$\lambda t'_i$ the time of saying

$\exists P_{\langle s, \langle i, \langle i, t \rangle \rangle \rangle} [t = \text{the time } z \text{ such that } P(w)(t')(z) \text{ & }$

$\forall \langle w'', t'' \rangle \in \text{SAY-ALT}(y, w, t') : Q(w'')(t'')(\text{the } z \text{ such that } P(w'')(t'')(z)) = \top]$

The function denoted by *say* first combines with the tense that has been moved from the lower clause and now is its sister. Then it combines with the intension of the predicate of times created by the movement. After that, it takes an individual (the subject) and the time argument of the higher clause. Intensional verbs

contribute quantification over time-concepts (relations between a world, time and another time). Those time-concepts should be understood as descriptions by which a believer represents a time interval to herself.

The denotation for v 2016 godu ‘in 2016’ is given in (36): it denotes a set of intervals within 2016.

$$(36) \quad \llbracket v \text{ 2016 godu} \rrbracket^{w,t,g,c} = \lambda t' . t' \subseteq 2016$$

Togda in (34) can either anaphorically refer to 2016 or the time in 2016 when Tanja said the words. I will assume the first option (but nothing hinges on this choice): the assignment function g maps index 7 on *togda* to the set of intervals in 2016. *Togda* will denote the set of intervals that surround 2016.

$$(37) \quad \llbracket \text{togda}_7 \rrbracket^{w,t,g,c} = \lambda t' : t' \neq t . g(7) \subseteq t' \\ = \lambda t' : t' \neq t . 2016 \subseteq t'$$

The intension of the predicate of times is computed in (38). In this system, the time of Putin’s presidency (in Tanja’s say-alternatives) and the local evaluation time are two distinct times. *Togda* contributes the presupposition that those two intervals are not equal to each other.⁹

$$(38) \quad \lambda w \lambda t . \llbracket 4 [t_4 [\text{togda}_7 \text{ Putin be president}] \dots] \rrbracket^{w,t,g,c} \\ = \lambda w \lambda t \lambda t' : t' \neq t . \text{Putin is the president in } w \text{ at } t' \& 2016 \subseteq t'$$

The resulting semantics for the entire sentence is given in (39).

$$(39) \quad \llbracket \text{Figure 1} \rrbracket^{w,t,g,c} = \top \text{ iff} \\ \exists P : g(4) = \text{the time } z \text{ such that } P(w)(g(2))(z) \& g(2) \subseteq 2016 \& \\ \forall \langle w'', t'' \rangle \in \text{SAY-ALT(TANJA, } w, g(2)) : [\lambda t' : t' \neq t'' . \text{Putin is the} \\ \text{president in } w'' \text{ at } t' \& 2016 \subseteq t'][\text{the } z \text{ such that } P(w'')(t'')(z)] = \top \\ \llbracket \text{Figure 1} \rrbracket^{w,t,g,c} \text{ is defined only if } g(2) < t \text{ and } g(4) < t$$

⁹The full *de re* analysis requires another presupposition in the embedded clause that the time of the state or eventuality described in the embedded clause is not in the future with respect to the local evaluation time (the upper limit constraint; cf. Abusch 1997). The full intension of the embedded clause is shown in (i). This presupposition is responsible for the fact that past-under-past cannot have the forward shifted reading.

(i) $\lambda w \lambda t . \llbracket 4 [t_4 [\text{togda}_7 \text{ Putin be president}] \dots] \rrbracket^{w,t,g,c}$
 $= \lambda w \lambda t \lambda t' : t' \neq t \& \neg t' > t . \text{Putin is the president in } w \text{ at } t' \& 2016 \subseteq t'$

This sentence is predicted to be true in case there is a time concept P that relates the particular time in the past when Tanja pronounced those words in the actual world and the past moment denoted by the moved past tense such that the same relation also holds between the time when Tanja located herself in her doxastic alternatives (her local now) and the time when Putin is the president in her doxastic alternatives.

One such possible time concept in the case under consideration is given in (40).

- (40) $\lambda w \lambda t' \lambda t'' . t''$ is a year-long interval that surrounds t' in w

The two intervals this concept relates are not equal to each other: one surrounds the other one, thus the presupposition introduced by *togda* is satisfied. The existence of the concept given in (40) can make the entire formula in (39) true. The presupposition requires that $g(4)$ and $g(2)$ are in the past. Given this time-concept, the first conjunct in (39) is as follows (41).

- (41) $g(4) =$ the time z such that z is a year-long interval that covers
the time $g(2)$ (the time when Tanja said those words) & $g(2) \subseteq 2016$

The second conjunct is also true: in all of Tanja's doxastic alternatives, Putin is president at the time z such that z is a year-long interval that surrounds her local 'now' (at the time when she said the words) and $2016 \subseteq z$.

Since the temporal *de re* construal derives the simultaneous reading of past-under-past without requiring that the two time intervals are exactly equal, the presupposition that *togda* carries is not going to be harmful for the meaning of the sentence. Thus, the presupposition that I am proposing is strong enough to rule out *togda* with present-under-past, but is weak enough to make it compatible with a simultaneous reading of past-under-past.

The semantics (39) also accounts for the fact that *togda* enforces the simultaneous reading.¹⁰

Togda picks the intervals that surround the time it is anaphoric to. When *togda* is in an embedded say-context and it is anaphoric to the time of saying, it is predicted to contribute the claim that what is described by the embedded sentence is happening at the time that surrounds the time of saying (from the speaker's perspective).

¹⁰I would like to thank an anonymous reviewer who made this point.

3 *Sejčas* in simultaneous readings of past-under-past in Russian

The set of assumptions that made it possible for us to derive the compatibility of *togda* with the simultaneous reading of past-under-past in complement clauses, leads to the prediction that *sejčas* ('now') should be acceptable in those contexts as well. Thus the contrast between (5) and (6) (repeated here as (42) and (43)) is not predicted.

- (42) Kogda ja govorila s nej tri goda nazad, Tanja skazala, čto ona (when I talk.PAST with her three years ago Tanja say.PAST that she sejčas) Ø beremenna.
now be.PRES pregnant

'When I talked to her three years ago, Tanja told me that she was pregnant (then/at that time).'

- (43) Kogda ja govorila s nej tri goda nazad, Tanja skazala, čta ona when I talk.PAST with her three years ago Tanja say.PAST that she byla (#sejčas) beremenna.
be.PAST now pregnant
(Intended:) 'When I talked to her three years ago, Tanja told me that she was pregnant (at that time).'

In (42) *sejčas* 'now' is acceptable, which means that *sejčas* is not an unshiftable indexical in Russian. In (42) *sejčas* picks the time interval three years ago when the conversation happened. Thus I will treat *sejčas* as sensitive to the evaluation time and not to the context time as shown in (44): *sejčas* denotes a predicate of times that is true of intervals that surround the local evaluation time. (If instead of surrounding we chose a relation of being equal to, it would not have any significant effect on the final outcome of the system.)

$$(44) \llbracket \text{sejčas} \rrbracket^{w,t,g,c} = \lambda t'. t \subseteq t'$$

Under those assumptions the fact that *sejčas* is acceptable in (42) follows straightforwardly (with the assumption that present tense in Russian can be interpreted as a relative present).

The main interest for us here is the example (43) and the fact that *sejčas* is not acceptable in this context. Again I will assume the *de re* construal for the simultaneous reading of past-under-past in (43). The LF that will be interpreted here, namely Figure 2, is structurally identical to the one given in Figure 1 (but the lexical items are different).

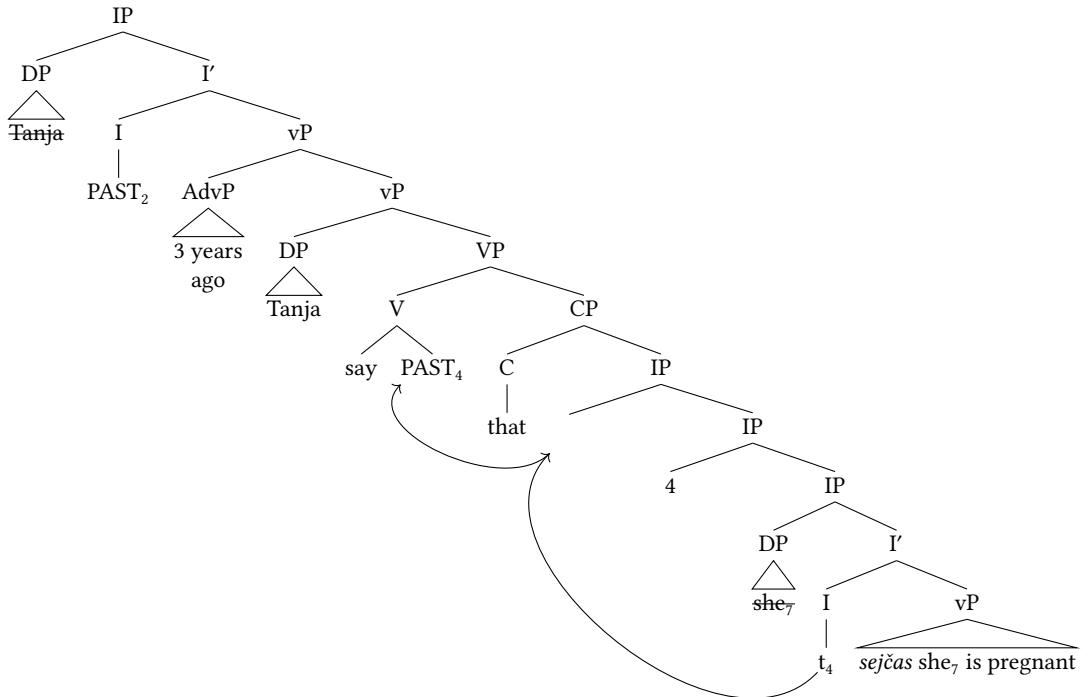


Figure 2: LF of the relevant part of (43)

Again, the attitude verb combines with its res-argument (the tense that was moved from the lower clause), the intension of the predicate of times created by the movement, an individual (the matrix subject), and the time argument of the matrix clause. The intension of the embedded clause is given in (45) (under the assumption that g maps index 7 to Tanja).

$$(45) \quad \lambda w \lambda t . [[4 [t_4 [sejčas she_7 \text{ is pregnant}]]]]^{w,t,g,c} \\ = \lambda w \lambda t \lambda t' . t \subseteq t' \& \text{Tanja is pregnant in } w \text{ at } t'$$

The resulting semantics for the entire sentence is given in (46).

$$(46) \quad [\text{Figure 2}]^{w,t,g,c} = \top \text{ iff} \\ \exists P : g(4) = \text{the time } z \text{ such that } P(w)(g(2))(z) \& g(2) \text{ is a time 3 years} \\ \text{ago} \& \forall \langle w'', t'' \rangle \in \text{SAY-ALT}(\text{TANJA}, w, g(2)) : [\lambda t' . t'' \subseteq t' \& \text{Tanja is} \\ \text{pregnant in } w'' \text{ at } t'](\text{the } z \text{ such that } P(w'')(t'')(z)) = \top \\ [\text{Figure 2}]^{w,t,g,c} \text{ is defined only if } g(2) < t \text{ and } g(4) < t$$

The contribution that *sejčas* ends up making is that the time of the state described by the embedded clause (Tanja's pregnancy) surrounds the time when Tanja locates herself in her doxastic alternatives at the time of saying. This should give us the simultaneous reading.

One possible concept that will be suitable in this case is given in (47).

(47) $\lambda w \lambda t' \lambda t'' . t''$ is a 9-month interval that surrounds t' in w

In the actual world, $g(4)$ (past time from the embedded clause) is the z such that it is the 9-month interval that surrounds $g(2)$ (past time of saying). In Tanja's alternatives Tanja is pregnant at the time z such that z is the 9-month interval that surrounds her local now.

Intuitively it is clear that the clash happens because *sejčas* has a present tense orientation and it is not compatible with the past tense. However, the past tense under the *de re* analysis of the simultaneous reading of past-under-past is not interpreted in the same clause as *sejčas*, thus no clash is predicted. Moreover the presence of *sejčas* in the sentence is predicted to enforce the simultaneous reading of past-under-past the way 'then' enforces it, due to the fact that *sejčas* picks intervals that surround the local evaluation time.

In order to account for the fact observed in (43) I suggest that when tense is interpreted outside of the embedded clause, *sejčas* is interpreted together with it.

This can be implemented in a system where tense and the adverbial undergo the res-movement together. To move *sejčas* together with tense, I will allow tense to combine with adverbials directly: I will change the denotation of tenses and suggest that they take predicates of times (like the one denoted by *sejčas* or *togda*) as their first arguments (48). I will consider tense pronouns to be definite articles of times: they combine with a predicate of times and return a specific time interval. In doing so I do not derail in a significant way from the pronominal semantics of tense. I adopt the idea that all pronouns are definite articles (Elbourne 2005). The pronominal element is still there in the semantics of tense suggested in (48). In this system, just like in the classic pronominal approach to the semantics of tense, past tense denotes a particular interval of time. An adverbial acts like a restrictor on the possible intervals that the tense can denote.

(48) $\llbracket \text{PAST}_2 \rrbracket^{w,t,g,c} = \lambda P_{\langle i,t \rangle} . it' P(t') = \top \ \& \ t' = g(2)$

$\llbracket \text{PAST}_2 \rrbracket^{w,t,g,c}$ is defined only if $g(2) < t$

If *sejčas* undergoes res-movement to the matrix clause together with the past tense, the restriction on the use of *sejčas* in simultaneous readings of past-under-past that we observe in (43) follows directly. The predicted result of applying

past to *sejčas* is given in (49). This is because given our definition in (44) the time interval denoted by *sejčas* has to surround the evaluation time, which for the matrix clause is the time of evaluation of the entire sentence, i.e. now. The time interval denoted by the past has to strictly precede the evaluation time. There is no interval that is simultaneously strictly in the past with respect to the current moment and surrounds it. Thus the clash between the past tense and *sejčas* is predicted.

- (49) $\llbracket \text{PAST}_2 \rrbracket^{w,t,g,c}(\llbracket \text{sejčas} \rrbracket^{w,t,g,c}) = \iota t' \ t \subseteq t' \ \& \ t' = g(2)$
 $\llbracket \text{PAST}_2 \rrbracket^{w,t,g,c}(\llbracket \text{sejčas} \rrbracket^{w,t,g,c})$ is defined only if $g(2) < t$

4 Then with present-under-past in English

In English, present-under-past in complement clauses cannot get the simultaneous reading. The English present tense cannot be interpreted as a relative present. The absence of the relative present reading in (50) shows that the English present tense is sensitive to the context time and not the evaluation time. In (50) present-under-past gets only the so-called double access reading.

- (50) This year Tanja said that Putin is the president of Russia.

This reading requires that if what Tanja said was true when she said it, then Putin must be the president of Russia now. This reading requires the embedded claim to be true at both the matrix utterance time and at the time of the doxastic alternatives. Abusch (1997) has shown that this reading can be derived if we interpret present tense of the embedded clause in (50) *de re*.

The present tense undergoes res-movement (Heim 1994). This creates the LF structurally similar to the one given in Figure 1. Again, given the semantics for *say* in (35) there is a parallelism requirement on the relation between the present tense moved from the embedded clause and the past moment of saying on the one hand and the relation between the time of the presidency in Tanja's say-alternatives and the time when she locates herself on the other. Due to a constraint on the interpretation of embedded tenses called the upper limit constraint – the idea that tense of an embedded clause cannot be a future directed concept – this cannot be the relation of the past preceding present and Putin's presidency being in the future with respect to Tanja's local now (Abusch 1997). The only other option is the relation of the surrounding, where the interval denoted by the present tense surrounds the one denoted by the past.

In English *then* is also not compatible with present-under-past (51).

- (51) #This year Tanja said that Putin is the president of Russia then.

Even if English *then* has the same denotation as Russian *togda* and carries the relevant presupposition, the restriction observed in (51) does not follow unless we make an assumption that the adverbial has to undergo the res-movement together with the present tense. This is the same problem as the one we saw with the Russian *sejčas* in *de re* construals.

In a *de re* construal tense moves out of the clause it originates in. The presupposition of the non equality between the evaluation time and the time intervals *then* picks will translate in this system into the requirement of non-identity of the time of presidency and the time when Tanja locates herself. This is not problematic, given that relation between them is the relation of surrounding. *This year* is an adverbial that is compatible with the present tense in English, thus if *then* can be anaphoric to this adverbial, no clash is predicted between *then* and the present tense.

The restriction we observe in (51) is straightforwardly predicted in the system where the English *then* has the same denotation as the Russian *togda*, shown in (52), and tense adverbials are interpreted together with tense. If tense undergoes the res-movement, the adverbial has to move with it.

- (52) $\llbracket \text{then}_5 \rrbracket^{w,t,g,c} = \lambda t' : t' \neq t . g(5) \subseteq t'$

If we extend the analysis suggested here for the Russian *sejčas*-cases to English cases with *then*, the fact observed in (51) follows without any further assumptions. Present tense takes *then* as its argument. The result of this is shown (53). Since *then* moves together with the tense and is also interpreted in the matrix clause, there is predicted to be a clash between the presupposition of the present tense (that it denotes the time interval equal to the context time that equals to the matrix evaluation time) and the presupposition of *then* (that the intervals it picks are not equal to the evaluation time). This is shown in (53).

- (53) $\llbracket \text{PRES}_2 \rrbracket^{w,t,g,c}(\llbracket \text{then}_5 \rrbracket^{w,t,g,c}) = \iota t' . g(5) \subseteq t' \ \& \ t' = g(2)$
 $\llbracket \text{PRES}_2 \rrbracket^{w,t,g,c}(\llbracket \text{then}_5 \rrbracket^{w,t,g,c}) \text{ is defined only if } g(2) = t_c \text{ and } g(2) \neq t$

Thus if we extend the analysis suggested here for the Russian *sejčas*-cases with the embedded past to English *then*-cases with the embedded present, the ill-formedness of (51) follows without any further assumptions.

5 Conclusion

In this paper, I looked at simultaneous readings of present-under-past and past-under-past in complement clauses in Russian. I have formulated the adverbial puzzle: there are adverbials like *togda* ‘then’ that can enforce the simultaneous reading of past-under-past but are completely infelicitous with present-under-past; and there are adverbials like *sejčas* ‘now’ that are compatible with an embedded relative present, but not with past-under-past.

I suggested that the restriction on the use of *togda* in Russian can be explained if *togda* carries a presupposition that the time intervals it picks are not equal to the evaluation time. I have shown that this presupposition is strong enough to make *togda* incompatible with the relative present, however weak enough to be compatible with the simultaneous reading of past-under-past. The reason for this is that the simultaneous reading of past-under-past in Russian is derived via *de re* construal and the meaning resulting from this construal does not require that the two intervals are equal, it is enough for them to simply overlap.

I have demonstrated that the fact that *sejčas* is felicitous with present-under-past in Russian and is not acceptable with the simultaneous reading of past-under-past does not follow from the classic *de re* analysis of simultaneous readings of past-under-past. The reason for this is that since the past tense moves out of the embedded clause, no meaning clash is predicted between the meaning of the present oriented adverbial *sejčas* and the past tense. I have shown that the fact that *sejčas* is infelicitous with past-under-past in Russian follows straightforwardly if we allow it to be interpreted *de re* together with an embedded past tense. I extended this analysis to explain the fact that *then* is not compatible with present-under-past in English.

Abbreviations

GEN	genitive	NOM	nominative
FUT	future tense	PAST	past tense
INF	infinitive	PRES	present tense
INST	instrumental	REFL	reflexive

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Chapter U

How factive is the perfective? On the interaction between perfectivity and factivity in Polish

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This paper aims to provide evidence for a systematic correlation between the perfective aspect of the matrix verb and the factive interpretation of embedded object sentences in Polish. Embedding by perfective matrix verbs makes propositions systematically ‘more factive’ than embedding by their imperfective counterparts. The strength of the inference depends on the semantic class the verb belongs to. The perfective operator introduces a nearly undefined truthfulness feature, which is specified as factive, veridical or reliable depending on the relation between the truth of the proposition expressed by the embedded clause and the event described by the matrix verb.

Keywords: perfectivity, factivity, veridicality, presupposition, entailment, implicature

1 Introduction

There is no one simple way to define factivity, and especially the truth-related inferences in general. In this paper, I will adopt assumptions which can be used to describe perfectivity-dependent truthfulness in Polish. It should be pointed out that the whole spectrum of the literature available is much broader.

According to Kiparsky 1970, a verb V that takes a that-clause p is called FACTIVE if asserting $\forall p$ presupposes the truth of the complement p (but

see also Karttunen 1971 for a discussion of the presuppositional account). Following Egré 2008, a verb *V* is called VERIDICAL if it entails the truth of its complement when used in the positive declarative form, more precisely if it satisfies the scheme $Vp \rightarrow p$ for all p , where p is a that-clause.

I will refer to the first option as TRUTH PRESUPPOSITION (factivity in a common sense). It holds when the inference remains under negation or after the insertion of a modal adverbial (for a semantic definition of presupposition, see Strawson 1950). Truth presupposition concerns for instance perfective *przewidzieć*, as can be seen in the following examples. ‘»’ marks presupposition.¹

- (1) Ola nie / prawdopodobnie przewidziała, że Marek boi się
Ola NEG probably predicted.PFV that Marek fears.IPFV REFL
duchów.
ghost.PL
'Ola did not predict / probably predicted that Marek fears ghosts.'
» Marek fears ghosts.
- (2) Ola nie / prawdopodobnie przewidywała, że Marek boi się
Ola NEG probably predicted.IPFV that Marek fears.IPFV REFL
duchów.
ghost.PL
'Ola was not predicting / was probably predicting that Marek fears
ghosts.'
↗ Marek fears ghosts.

Examples (1) and (2) consist of an aspectual minimal pair exhibiting complementary behavior of the feature [±perfective] with respect to the enforcing of a factive interpretation of their complement sentences. Whereas the perfective variant presupposes the truth of its sentential argument, the imperfective one does not. After the insertion of a sentence negation or a modal adverbial, (1) implicates that Marek fears ghosts. Sentence (2) only says that Ola was guessing / tried to predict that Marek fears ghosts, but it leaves it open whether she was correct or not.

The second option will be called TRUTH ENTAILMENT. Truth entailment results in an occurrence of a veridical meaning of the proposition expressed by the subordinate clause. Here, the inference is present in affirmative sentences, but it

¹All embedded verbs are marked for the imperfective aspect and used in the present tense in order to exclude the influence of perfectivity and past tense morphology within the subordinate clause on the truth inferences observed.

does not project. We can find it for example in the perfective *potwierdzić*. I will use '→' to mark entailment.

- (3) Komisarz potwierdził, że Marek boi się duchów.
 commissioner confirmed.PFV that Marek fears.IPFV REFL ghost.PL
 'The commissioner confirmed that Marek fears ghosts.'
 → Marek fears ghosts.

- (4) Komisarz potwierdzał, że Marek boi się duchów.
 commissioner confirmed.IPFV that Marek fears.IPFV REFL ghost.PL
 'The commissioner was confirming that Marek fears ghosts.'
 → Marek fears ghosts.

Truth entailment can be found in *potwierdzić* and is absent in *potwierdzać*; whereas it seems to follow from (3) that Marek fears ghosts, (4) states that this is a possible, but not an obligatory interpretation. The inference presented in (3) does not project, which excludes it from being a presupposition. Consider (5).

- (5) Komisarz nie / prawdopodobnie potwierdził, że Marek boi się duchów.
 commissioner NEG probably confirmed.PFV that Marek
 fears.IPFV REFL ghost.PL
 'The commissioner did not confirm / probably confirmed that Marek fears
 ghosts.'
 → Marek fears ghosts.

The third and weakest option is the TRUTH IMPLICATURE (see also Hacquard 2006 for the so-called actuality implicature, as illustrated in (9)). I will use this term to refer to an inference which cannot be captured by factivity or veridicality (it is clearly pragmatic, since it can be canceled). Here, the proposition embedded under a perfective communication verb is taken for granted due to the reliability of the sentence subject (cf. Schlenker 2010 for the factivity of announcements). The same proposition embedded under a particular imperfective counterpart is neutral with respect to the reliability condition. Consider examples (6a) and (6b). I will use '⇝' to mark implicature.

- (6) a. Ela powiedziała, że jest w pracy.
 Ela said.PFV that is.IPFV at work
 'Ela said that she is at work.'
 ⇝ Ela is at work.

- b. Ela mówiła, że jest w pracy.
Ela said.IPFV that is.IPFV at work
'Ela was saying that she is at work.'
⇒ Ela is at work.

In the perfective variant (6a), the speaker takes the truth of what the sentence subject said for granted; Ela is considered reliable and she is expected to tell the truth. In the imperfective variant (6b), the speaker does not want to commit herself to the truth of the proposition. It is left open whether the speaker considers the sentence subject reliable. As a result, there is no implicature that Ela is at work. The reliability effect seems to correlate with fulfilling all the parts of the speech act (see §4.3), which is necessarily the case when using the perfective and which does not have to be the case when using the imperfective (see CohenKrifka2014; Krifka 2015 for commitment space semantics).

We could refer to the abovementioned inferences as a TRUTHFULNESS SCALE. The strongest inference – truth presupposition – represents the highest value on that scale, while truth implicature stands for the lowest one. Between them there is the medium strength inference – truth entailment. A more detailed classification may be developed after more conclusive research has been done.

Perfectivity-dependent truthfulness needs to be distinguished from the truthfulness of inherently factive imperfectives, where the perfectivizing operation only results in the specification of a temporal boundary of an event, for instance: *żałować* 'regret.IPFV' vs. *pożałować* 'start regretting.PFV' (cf. Egré2008 for an interesting discussion about *regret*, though), unless the meaning of the derivate becomes non-compositional (*wiedzieć* 'know.IPFV' + factive vs. *powiedzieć* 'say.PFV' + non-factive). In contrast, all truth inferences which originate from the perfective do not occur in the case of the respective imperfective counterparts.

At this point, I would like to make an important remark concerning the tense of the matrix verb. I use the past tense in all examples, because it is available for any verbal stem regardless of the aspectual marking. The present tense morphology results in future reference in the case of the perfective, whereas both present tense and the periphrastic future construction are available for the imperfective. Because the analyzed sentences are supposed to be minimal pairs (differing only in the aspectual marking on the matrix verb), using the past tense was the only option.

In this paper, I will examine different verbs falling into class 1 (truth presupposition), class 2 (truth entailment) and class 3 (truth implicature). I provide an account of perfectivity-dependent truth inferences in Polish, which will be presented in §5. Before coming to that, I will briefly discuss the influence of aspect

on the interpretation of nominal arguments, which serves as a starting point for an investigation of the correlation between the perfectivity of the matrix verb and the interpretation of complement sentences.

2 Aspect and the interpretation of nominal arguments

It has been pointed out by Wierzbicka (1967) that in perfective sentences in Polish the direct object is interpreted as definite, while in imperfective ones it is understood as indefinite. Consider example (7).

- (7) On zjadł / jadł orzechy.
 he ate.PFV ate.IPFV nut.PL
 'He ate all of the nuts / was eating (some) nuts.'

In the case of *zjadł*, the reference is to a definite group of entities – the nuts. The object is completely affected by the verbal process (as a result, there are no more nuts left). In contrast, neither the definite nor the totality reading is enforced when using *jadł*. Here, the partitive interpretation is available amongst others, corresponding to 'some of the nuts'.

However, Filip (2005: 128) shows that perfective aspect does not always require that bare nominal arguments in its scope refer to one whole and specific individual (consider for instance the perfective Czech and Polish equivalents of the English verb *bring*). That means that not only aspect, but also verb semantics and especially the thematic relation between the nominal object and the verb determine the referential properties of the entire predicate.

The crucial point is that the perfective operator can take scope over both the matrix verb and its nominal complement. A formal analysis of this correlation has been developed by Krifka (1989a,b; 1992; 1998). Different theoretical implementations are possible; because it is not the main focus of this paper, I will not discuss them in greater detail.

According to Krifka, complex verbal expressions (verb plus direct object) have either a cumulative or a quantized reference. We can define them in terms of the sum operation: $x \sqcup y$ 'the sum of x and y '. For example, the sum of two events of 'eating grapes' still yields an event of 'eating grapes'. The predicate 'eating grapes' has a cumulative reference – we can apply it not only to the single events, but also to the sum of them. In contrast, the joining of two events of 'eating two grapes' can no longer be described with 'eating two grapes', because 'eating two grapes' plus 'eating two grapes' does not equal 'eating two grapes'. The predicate 'eating

two grapes' has a quantized reference – we can apply it to the single events, but not to the sum of them. Apart from the sum operation, the proper part relation can be defined: $x \sqsubset y \leftrightarrow x \sqsubseteq y$ and $x \neq y$. For example, there is no proper part of an event 'eating two grapes' which is an event of 'eating two grapes'. This illustrates another property of the quantized reference.

Krifka assumes that the perfective operator presupposes the quantization of the entire predicate, whereas the imperfective operator requires its cumulativity. This correlation primarily (but not exclusively, cf. Krifka 1998) holds for predicates which allow mapping of objects to events and vice versa (the so-called homomorphism of objects to events). Certainly, it cannot be considered a 1:1 relationship (cf. Filip 1996; 2005 or Borik 2006). In Polish, the verbal predicate marked with the perfective aspect is quantized iff the whole verbal complex receives a telic interpretation, particularly in the case of predicates with nominal objects that are incremental themes. On the other hand, we get the combination of features [+perfective] and [-telic] after adding the delimitative prefix *po-* to the imperfective stem; in these cases the predicate is to be interpreted as atelic despite the perfective marking on the verb. Thus, the following generalization holds for Polish: telicity implies quantization, but perfectivity does not imply telicity (see also Gehrke 2008). As will become clear later, the truth inference of a sentential complement is triggered by perfectivity.

3 Cross-linguistic evidence for the interaction between perfectivity and factivity

The influence of the perfective aspect of a matrix verb on the factive interpretation of complement clauses has already been observed. Hacquard (2006) shows that both actuality entailment and actuality implicature can be found in some modal constructions in French, when a modal is marked with the perfective.

Actuality entailment refers to the uncancelable inference stating that the proposition expressed by the complement clause holds in the actual world.² Consider (8), adapted from Hacquard (2006: 21).

- (8) Jane #a pu / pouvait soulever cette table, mais elle ne
Jane AUX could.PFV could.IPFV lift this table but she NEG

²Bhatt (1999) observed the correlation between perfectivity marked on ability modals and the presence of the actuality entailment in Greek and Hindi.

- I'a pas soulevée.
 it.AUX NEG lift
 'Jane could lift this table, but she did not lift it.'

Example (9) demonstrates an actuality implicature (adapted from *ibid.* 16).

- (9) Darcy a eu / avait la possibilité de rencontrer Lizzie.
 Darcy AUX had.PFV had.IPFV the possibility to meet Lizzie
 'Darcy had the possibility to meet Lizzie.'

When used with the perfective, (9) strongly suggests (but does not entail) that Darcy did meet Lizzie.

The correlation between perfectivity and factivity can also be seen in Hungarian; it concerns the influence of embedding verbs of saying on the interpretation of their sentential complements. Whereas *megmond* 'say.PFV' requires the argument to be true, *mond* 'say.IPFV' does not (see [Kiefer 1986](#)). Even though aspect is not grammaticalized in Hungarian (it is not obligatory for every verb to have its (im)perfective twin), informal investigations among speakers show that we can observe clear aspect-dependent differences with respect to the truthfulness of propositions embedded under verbs marked as perfective.

In the next section I am going to present Polish data showing a systematic interaction between perfectivity and truthfulness. In Polish, the category of aspect is fully grammaticalized, which allows us to take a closer look at the abovementioned dependency.

4 Aspect-dependent truth inferences in Polish

4.1 Case 1: Truth presupposition

One group of verbs where the truth presupposition of the perfective can be found is verbs of guessing.³ From (10) it follows that the proposition from the embedded clause – Marek fears ghosts – is true. Example (11) demonstrates that this inference projects, i.e. it remains under negation and after the insertion of a modal adverbial.

³The strength of the inference may also depend on *akionsart*. For example, a resultative verb *wyczuć* 'sense.PFV' is factive, whereas the inchoative *poczuc* 'start feeling.PFV' is not (a similar observation holds for Czech, Radek Šimík, p.c.). It seems that inchoativity does not give rise to factivity, but to a weak truth implicature.

- (10) Jan zgadł / wyczuł, że Marek boi się duchów.
Jan guessed.PFV sensed.PFV that Marek fears.IPFV REFL ghost.PL
'Jan guessed that Marek fears ghosts.'
» Marek fears ghosts.
- (11) Jan nie / prawdopodobnie zgadł / wyczuł, że Marek
Jan NEG probably guessed.PFV sensed.PFV that Marek
boi się duchów.
fears.IPFV REFL ghost.PL
'Jan did not guess / probably guessed that Marek fears ghosts.'
» Marek fears ghosts.

Contrary to this, no such inference appears with the particular imperfective counterparts. Example (12) shows that there is no entailment, let alone presupposition, that Marek fears ghosts when the subordinate clause is embedded under the imperfective variants of 'guess' / 'sense'.

- (12) Jan zgadywał / wyczuwał, że Marek boi się duchów.
Jan guessed.IPFV sensed.IPFV that Marek fears.IPFV REFL ghost.PL
'Jan supposed that Marek fears ghosts.'
→ Marek fears ghosts.

As expected, the truth inference is also absent under negation and after the insertion of a modal adverbial. Consider (13).

- (13) Jan nie / prawdopodobnie zgadywał / wyczuwał, że Marek
Jan NEG probably guessed.IPFV sensed.IPFV that Marek
boi się duchów.
fears.IPFV REFL ghost.PL
'Jan did not suppose / probably supposed that Marek fears ghosts.'
→ Marek fears ghosts.

Examples (12) and (13) leave it open whether it is true that Marek fears ghosts. Other members of this class are: *odkryć*, *odkrywać* 'discover', *rozgryźć*, *rozgryzać* 'figure out', and *rozpoznać*, *rozpoznawać* 'identify'.

4.2 Case 2: Truth entailment

Many perfective matrix verbs show an implicative behavior with respect to the truth inference of the proposition from the subordinate clause. For instance, verbs

of proving seem to entail that their sentential argument is true, which can be seen in (14). *Udowodnić* and *wykazać* are much stronger in their veridicality than *pokazać* however.

- (14) Jan udowodnił / wykazał / pokazał, że Marek boi się duchów.
 Jan proved.PFV revealed.PFV showed.PFV that Marek fears.IPFV REFL duchów.
 ghost.PL

'Jan proved / revealed / showed that Marek fears ghosts.'
 → Marek fears ghosts.

Interestingly, this inference is apparently cancelable in particular contexts. Consider (15) (cf. AnandHacquard2014).

- (15) Jan udowodnił Basi, że Marek boi się duchów, jednak Krzysiek w to wątpi.
 Jan proved.PFV Basia.DAT that Marek fears.IPFV REFL ghost.PL but Krzysiek in this doubts
 'Jan proved to Basia that Marek fears ghosts, but Krzysiek doubts that.'
 → Marek fears ghosts.

All the predicates in (14) allow an overt experiencer, which makes veridicality questionable. (15) says that Jan succeeded in convincing Basia that Marek fears ghosts, but he did not manage to convince Krzysiek. As a result, the lexical entry of the matrix predicate corresponds more to *convince* than to *prove*.

The 'weak entailment' from (14) does not project under negation or after the insertion of a modal adverbial, which can be seen in (16).

- (16) Jan nie / prawdopodobnie udowodnił / wykazał / pokazał, że Marek boi się duchów.
 Jan NEG probably proved.PFV revealed.PFV showed.PFV that Marek fears.IPFV REFL ghost.PL
 'Jan did not prove / reveal / show / probably proved / revealed / showed that Marek fears ghosts.'
 → Marek fears ghosts.

Example (16) only says that Jan did not succeed / that Jan probably succeeded in providing arguments for Marek's fear of ghosts, but it leaves it open whether the complement sentence is true or not.

We have just seen that the weak truth entailment in the case of perfective verbs of proving can disappear in particular contexts, especially after an overt realization of an experiencer. Furthermore, the significance or trustworthiness of the authority also plays a role in acknowledging a complement proposition as veridical. No projection pattern can be observed, which means that we are not dealing with a presupposition here.

Particular imperfective forms lack any kind of truth-contributing potential. Consider example (17) for affirmative sentences.

- (17) Jan udowadniał / wykazywał / pokazywał, że Marek boi się duchów.
Jan proved.IPFV revealed.IPFV showed.IPFV that Marek fears.IPFV REFL duchów.
ghost.PL
'Jan was proving / revealing / showing that Marek fears ghosts.'
→ Marek fears ghosts.

Example (17) asserts that Jan was trying to prove / reveal / show that Marek fears ghosts, but it does not make any statement about the final results of Jan's investigations. As expected, no truth inference can be found under negation or after the addition of a modal adverbial, which can be seen in (18).

- (18) Jan nie / prawdopodobnie udowadniał / wykazywał / pokazywał,
Jan NEG probably proved.IPFV revealed.IPFV showed.IPFV
że Marek boi się duchów.
that Marek fears.IPFV REFL ghost.PL
'Jan was not / probably proving / revealing / showing that Marek fears ghosts.'
→ Marek fears ghosts.

Example (18) demonstrates possible modifications of the likelihood of Jan having tried to prove / reveal / show that Marek fears ghosts. No contribution to the truth-related meaning of the complement sentence can be observed. Another member of this group is for instance *przekonać*, *przekonywać* 'convince'.

4.3 Case 3: Truth implicature

Truth implicature refers especially to the perfective communication verbs, which differ from their imperfective counterparts in that the former, but not the latter, entail the complete realization of all parts of the speech act. Austin (1962) defines a speech act as consisting of three partial acts. The first one, a locutionary

act, is the act of uttering itself. The second one, an illocutionary act, affects the area of the speaker's intention. Finally, a perlocutionary act describes an actual effect the particular speech act had on the hearer. A speech act is presumed to be completely realized only if all three parts have been fulfilled. In Polish, perfective communication verbs, in contrast to imperfective ones, enforce complete fulfillment of all parts of the speech act, as example (19) illustrates.⁴

- (19) Iza właśnie go o tym #*poinformowała* / *informowała*, ale
 Iza just him about that informed.PFV informed.IPFV but
 przerwał jej w pół słowa.
 interrupted her in middle word
 'Iza has just informed / was just informing him about that, but he
 interrupted her in the middle of the sentence.'

Only *poinformowała* entails that the hearer received the information.

5 Perfectivity-dependent truthfulness

First of all, a short note on telicity should be made. My object of investigation is embedding predicates, which are transitive verbs. They all require a direct object, realized as a sentential complement; for the purpose of my analysis, I consider that-clause a definite argument. For this reason, the whole complex predicate receives a telic interpretation, independently of the (im)perfective marking on the verb. The truth inference is present when the matrix predicate has the features [+telic, +perfective], and it is absent when the matrix predicate has the features [+telic, -perfective].

Based on the influence of aspect on the interpretation of nominal arguments, I also assume a dependency between aspect and a propositional argument. The aspectual operator PFV introduces a further undefined truthfulness feature, which is specified as factive, veridical or reliable via the dependency between the truth of *p* (where *p* stands for the proposition expressed by the that-clause) and an event *e* described by the matrix verb. For now, the three truthfulness-realizations can be formalized as follows:⁵

⁴I would like to thank Manfred Krifka for inspiring this idea.

⁵The operations are based on the semantics of the perfective and not on the formation patterns. In future work, the morphology will be integrated into the semantic account (cf. Mlynarczyk 2004).

- (20) For a VP with a propositional complement p
- a. $\text{PFV}(\lambda e. [\![\text{VP}]\!](e)$ such that the truth of p is independent of e)
→ p is factive
 - b. $\text{PFV}(\lambda e. [\![\text{VP}]\!](e)$ such that the truth of p is dependent on e)
→ p is veridical
 - c. $\text{PFV}(\lambda e. [\![\text{VP}]\!](e)$ such that the truth of p is communicated by e)
→ p is reliable

Truth presupposition comes about when the truth of p is independent of the truth of e . Here, no incremental creation of belief can be observed. For example, the truth of propositions embedded under *zgadnąć* or *przewidzieć* holds independently of the process of guessing or predicting. In contrast, the truth of propositions embedded under *udowodnić*, *wykazać* or *pokazać* does depend on the result of the proving-process; we have an incremental creation of belief. This explains why the authority of an experiencer or its overt realization are crucial for judging complement sentences as veridical. In the case of truth implicature, the truth of p is ‘only’ communicated by e .

The question remains whether ‘being reliable’ should be considered a feature at all, or if it should be labeled as ‘no feature present’. In the latter case, truthfulness set up by the perfective operator would remain unrealized if the inference was an implicature. Another open question concerns the role of morphology in determining the strength of the inference. It seems that perfective underlying forms tend to enforce factive meaning of the proposition expressed by the subordinate clause. Additionally, verb semantics and argument structure may also be taken into consideration, since specifying an experiencer can influence the entailment pattern. In general, the semantic type of the matrix verb could be used to distinguish between different verb classes and to establish a more fine-grained truthfulness scale. All this will be the subject of further investigations.

In the last section of this paper I will briefly discuss the inherently factive imperfectives and their perfective counterparts. It will be shown that they constitute a unique group with factivity being an aspect-independent, lexical property of the root form, which automatically projects to the perfective derivate.

6 Remark on inherently factive imperfectives

As has been mentioned before, inherently factive imperfectives (for example emotive factives) require their complements to be true. Consider example (21).

- (21) Ania cieszyła / ucieszyła się, że idzie lato.
 Ania was.happy.IPFV was.happy.PFV REFL that comes.IPFV summer
 ‘Ania was happy / started being happy about the fact that the summer
 was coming.’
 » The summer was coming.

The only difference between *cieszyła* and *ucieszyła* lies in the marking of the beginning of a state in the case of the latter. The underlying imperfective form is inherently factive (lexical factivity), so it remains factive when perfectivized. In the case of inherently factive imperfectives the perfectivizing operation leads to the marking of a temporal boundary of an event, but it does not enforce or change the truth inference of the proposition from the embedded clause (see also §1). This pattern needs to be distinguished from the ones discussed in §4 and §5, where the truth inference ascribed to the perfective was absent in the particular imperfective forms. Other inherently factive imperfectives are *rozumieć* ‘understand’ and *kapować* ‘get’.

7 Conclusion

In this paper, I demonstrated three kinds of perfectivity-dependent truth inferences in Polish: truth presupposition, truth entailment and truth implicature. In the case of truth presupposition, the proposition from the embedded clause receives a factive interpretation. The inference remains under negation or after the insertion of a modal adverbial. In the case of truth entailment, a veridical interpretation of the complement sentence can be observed; only the positive sentence is interpreted as true. In the case of truth implicature, the inference in question is neither factivity nor veridicality. It is due to a pragmatic principle giving preference to the perfective verb if the speaker assumes that the sentence subject is reliable (speaker commitment to the truth of *p*).

Despite the differences in the strength of particular inferences, the truthfulness of the proposition from the embedded clause is only due to perfectivity – it is absent with imperfective forms. Embedding by imperfective matrix verbs results in the occurrence of a neutral interpretation of a that-clause with respect to its truthfulness, provided that the embedding imperfective verb is not inherently factive. The aspectual operator PFV introduces a truthfulness feature, which is realized as factive, veridical or reliable depending on the relation between the truth of the proposition expressed by the embedded clause and an event described by the matrix verb.

The question remains as to how truthfulness interacts with perfectivity itself. In the case of communication verbs, the completedness condition of the perfective enforces the complete performance of the speech act denoted by the matrix verb. The speaker of the sentence chooses the perfective if she considers the speaker of the speech act reliable. As a result, the proposition expressed by the that-clause is understood to be true. In the case of verbs of proving, the completedness effect of the perfective interacts with the incrementality, which is a part of lexical verb semantics. A proof is a proof after its final step is completed. For verbs of guessing, the truth presupposition is triggered in combination with the integration of the proposition ‘someone guessed something’ into the common ground. The speaker uses the perfective in order to demonstrate that the guessing event has been completely realized. The cooperative hearer accepts the proposition as true, which triggers the presupposition rooted in the lexical verb semantics.⁶

In future work, a detailed study with different semantic groups of verbs will be conducted. In addition the type of embedding is to be controlled for, since it may be involved in determining the strength of the inference available. An interesting observation concerns perfective verbs of saying which embed wh-phrases; they seem to function as exhaustivity triggers. Thus, exhaustivity could also be used to make the truthfulness scale more fine-grained.

Abbreviations

DAT	dative	PL	plural
(I)PFV	(im)perfective	REFL	reflexive
NEG	negation		

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