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The Third Cornell Meeting 2016

Edited by
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Contents

Preface

The articles in this volume arose from papers given at the Twenty-fifth Workshop on Formal Approaches to Slavic Linguistics, which was held at Cornell University, Ithaca, New York, May 13-15, 2016. Invited speakers were Michael Becker (Stony Brook University), Gaja Jarosz (University of Massachusetts at Amherst), and Catherine Rudin (Wayne State College). A total of 53 abstracts were submitted for the meeting, of which 30 were accepted. All but one of these were presented at the meeting. The program and abstracts remain available at the conference's website, http://conf.ling.cornell.edu/FASL25/.

Authors were invited to submit written versions for publication; after another round of reviewing, we received final versions of the 16 articles that are published in this volume.

The editors are grateful to the Cornell Linguistics Department (chair Draga Zec, from 2017 John Whitman) for generous financial support, and to Michael Williamson and Holly Boulia (administrative manager and assistant) for organizational help. We thank our reviewers, both those who reviewed abstracts before the conference and those who reviewed papers afterwards: Boban Arsenijević, John Bailyn, Michael Becker, Christina Bethin, Petr Biskup, Joanna Błaszczak, Lev Blumenfeld, Željko Bošković, Wayles Browne, Barbara Citko, Luka Crnič, Miloje Despić, Mojmír Dočekal, Jakub Dotlačil, Naomi Enzinna, Maria Gouskova, Martina Gračanin-Yüksek, Vera Gribanova, Boris Harizanov, Simone Harmath-de Lemos, Tania Ionin, Peter Jurgec, Volya Kapatsinski, Robin Karlin, Darya Kavitskaya, Alexei Kochetov, Ivona Kučerová, James Lavine, Marijana Marelj, Franc Marušič, Ora Matushansky, Krzysztof Migdalski, Milan Mihaljević, Sarah Murray, Andrew Nevins, Roumyana Pancheva, Barbara Partee, Ljiljana Progovac, Susan Rothstein, Catherine Rudin, Paweł Rutkowski, Radek Šimík, Natalia Slioussar, Todd Snider, Peter Staroverov, Sandra Stjepanović,

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Jindřich Toman of the University of Michigan deserves special gratitude as the founder of the FASL series of conferences and the director of Michigan Slavic Publications, which has published their proceedings since the beginning (1991). We appreciate the work by him and his staff to ensure that the present book could see the light of day.

The editors
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Miloje Despić,
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Serbian-speaking Broca's Aphasics: Some Problems for Theories of Aphasia*

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1 Introduction

Damage to the left frontal lobe of the brain (Broca's area) results in a pattern in which speech is non-fluent, with omission of both bound and free grammatical morphemes. The early profile of Broca's aphasics was one in which comprehension of speech was relatively unimpaired, in contrast to individuals with damage to other areas of the brain. However, literature since the 1980s has revealed deficits in comprehension, with a

* The order of authors is alphabetical. This research was supported in part by SSHRC grant to 410-2004-0783 to Helen Goodluck and Danijela Stojanović. Helen Goodluck is the corresponding author. We are grateful to two anonymous reviewers, and to the FASL 25 audience, particularly Wayles Browne, for very helpful comments.

concomitant range of explanations. In this paper, we report two experiments that challenge hypotheses concerning the successes and failures Broca's patients experience.

The first hypothesis concerns the use of case marking. Serbian uses case marking to distinguish the role of noun phrases. In our first experiment, testing the comprehension of questions, we found selective deficits that indicate that case marking is to some degree impaired in Serbian-speaking Broca's patients. This runs counter to the claim of Kljajevic (2012), who asserted on the basis of a study of Croatian that case marking leads to superior performance in Croatian-speaking Broca's patients, as opposed to English-speaking patients. In this experiment, we also observe a difficulty in comprehending D(iscourse)-linked phrases (such as *koji tigra* 'which tiger'), a finding similar to those in experiments with English- and German-speaking patients (Salis and Edwards 2008, Neuhaus and Penke 2008).

The second hypothesis we tested concerned the source of the problems in comprehending D-linked phrases. Avrutin (2000, analysing data from Hickok and Avrutin, 1993, 1996) suggested that the deficits in Broca's patients were the result of a lack of ability to compute binding chains – i.e. chains formed by pronominal linkage, opposed to movement. Serbian offers an excellent opportunity to test this hypothesis, since some questions can be formed by either a mechanism of wh-movement or by a mechanism of pronominal binding. We found that Serbian-speaking Broca's patients do not exhibit greater difficulty with questions formed by pronominal binding, contrary to the hypothesis that Binding chains are impaired in Broca's patients. We concur with Avrutin (2000), however, that Broca's patients may have particular difficulty with integrating discourse-related information into the parse.

2 Experiment 1

2.1 Background

English-speaking Broca's patients have been tested on the question types in (1-4).

(1) Who followed the tiger? (Subject question, non-D-linked question phrase)

(2) Which lion followed the tiger? (Subject question, D-linked question phrase)

(3) Who did the tiger follow? (Object question, non-D-linked question phrase)

(4) Which lion did the tiger follow? (Object question, D-linked question phrase)

Hickok and Avrutin (1995, 1996) studied two Broca's patients; the experimenter acted out a scenario, and the patient's task was to point to the correct animal in answer to the question. Hickok and Avrutin found that the question types in (1-3) resulted in an above chance performance, whereas performance on the question type in (4) was at chance. Avrutin's (2000) explanation is that a plus Discourse-linked (+DL) phrase is subject to a non-movement (i.e. a binding) analysis, and that binding chains are impaired in Broca's aphasia.[1] The success with question type (2) and poor performance with question type (4) results from use of a strategy whereby the first NP is assigned the role of agent/subject (Grodzinsky, 1990). In sentence (2), it results in correct performance, but in (4) there is a conflict: the first NP *which lion* is assigned agent by the strategy, but the second NP *the tiger* is also agent via direct assignment of theta-roles from the verb. The aphasic patient is thus forced to guess which NP is the subject, and the performance is at chance.

A number of subsequent studies show results that are more complex than those found by Hickok and Avrutin. Thompson, Tait, Ballard and Fix (1999) and Salis and Edwards (2008) found that only some subjects followed the pattern of above chance performance on (1-3) and chance on (4). In a study of German, Neuhaus and Penke (2008) also found that only a subset of aphasic persons followed that pattern.

In a study of Croatian, Kljajević (2012) found that no subject followed the pattern reported by Hickok and Avrutin. She tested three Broca's patients and three mixed non-fluent patients, one mixed fluent and one anomic patient (a reduced set is also reported in Kljajević and Murasugi, 2010). The same procedure was used as in the previous studies. Of the patients tested, only two of the mixed non-fluent patients showed a deficit, with better comprehension of object extraction than of

[1] The motivation for proposing a binding analysis (Cinque 1990, Rizzi 1990) is the amelioration of island constraints when the question phrase is D-linked. See Saah and Goodluck (1995) and Goodluck, Saah and Tsiwah (2015) for cross-linguistic support for this hypothesis.

subject extraction (the inverse of the subject-object asymmetry found for languages such as English). Kljajević claims that case marking permits Croatian-speaking Broca'a patients to circumvent the difficulty that English speakers have with questions such as (1-4). The finding that object questions are easier than subject questions for two patients (contrary to the pattern in English) is attributed to the greater saliency of object case marking.

The fact that German is a language with case marking causes concern for Kljajević' proposal (Neuhaus and Penke, 2008), as does the fact that the number of subjects in Kljajević study is small. Furthermore, only three of patients were Broca's aphasics. We report in this section that follows a study of Serbian, which shares the case system with Croatian, with the same seven cases and the same endings for them (Brown and Alt, 2004).

2.2 Participants

The subjects were 20 aphasic patients, comprising 8 male and 12 female, 47-70 years old. Most of them (18) were diagnosed as Broca's and two were diagnosed as mixed non-fluent, by means of an adaptation of the Boston Diagnostic Aphasia Examination (BDAE, Goodglass, Kaplan and Baressi, 2001).[2] Ten unimpaired persons were also tested; performance was near perfect (involving one error by one person).

2.3 Materials and Procedure

The materials consisted of sentence types (5-8).

(5) Ko_i je t_i pratio tigra? (Subject question, -DL)
Who_{NOM} aux followed $tiger_{ACC}$
'Who followed the tiger?'

(6) Koji lav_i je t_i pratio tigra? (Subject question, +DL)
Which $lion_{NOM}$ aux followed $tiger_{ACC}$
'Which lion followed the tiger?'

(7) $Koga_i$ je tigar pratio t_i? (Object question, DL)
Who_{ACC} aux $tiger_{NOM}$ follow
'Who did the tiger follow?'

[2] The scores on the adaptation of the BDAE are available on request.

(8) Kojeg $lava_i$ je tigar pratio t_i? (Object question, +DL)
Which $lion_{ACC}$ aux $tiger_{NOM}$ follow
'Which lion did the tiger follow?'

Each participant responded to eight tokens of each question type, arranged in four blocks of two tokens of each type. The task was the same as Hickok and Avrutin (1996), other than that the materials were video recorded. The video provided the context for each question, showing an animal of type x performing an action on an animal of type y, and the animal of type y then performing the same action on another animal of type x. This type of context is suitable for all four questions in (1-4/5-8). The participant had to point to the animal that s/he thought was the answer to the question. Five different action verbs were used (*pratiti* 'follow', *češati* 'scratch', *gurnuti* 'push', *juriti* 'chase', *šutnuti* 'kick'). There were 12 pairs of identical animals. Gender (masculine, feminine) of the nouns (animals) was used in equal proportions. In two of the four blocks the action proceeded from right to left and in the other two the action proceeded from right to left.

2.4 Results

The performance of individual participants is given in Table 1. We excluded those who scored above chance on all four conditions (6, 7, or 8/8 correct [subjects KM, DjG, DA and VD]). The remaining 16 participants can be analysed as falling into the following patterns of responses:[3]

A. Generalized subject problem (the pattern found also by Kljajević, 2012): both subject conditions are more difficult than object questions (n=2, MLJ and AM)
B. Generalized object problem: both object conditions are more difficult than subject questions (n=1, GM)
C. D-linking problematic:
a) both subject and object D-linked questions are more difficult than non-D-linked questions (n=3, KZ, SN and CLj)

[3] This division into groups was based on a minimum difference of two between the scores that defined the groups.

b) D-linked subject questions are the most difficult condition (n=2, ZP and MK)

c) D-linked object questions are the most difficult condition, as found by Hickok & Avrutin, (1995, 1996) (n=2, DM and LD)

D. Non-D-linked object questions are the most difficult condition (n = 5, SJ, BS, ZZ, JS and LDj).

E. Both subject question types and object D-linked questions are below chance (n = 1, CB).

Participant	Subject –DL	Subject +DL	Object –DL	Object +DL	Pattern
DM	7	7	7	5	Cc
KM	8	8	8	6	
DjG	8	7	8	8	
SJ	8	7	0	8	D
CB	5	4	7	5	E
DA	7	8	8	6	
BS	8	8	4	8	D
ZZ	8	8	3	7	D
VD	8	8	6	6	
JS	8	6	4	6	D
MLJ	4	2	8	8	A
KZ	6	4	6	4	Ca
ZP	7	5	7	7	Cb
SN	8	4	6	4	Ca
AM	2	3	8	7	A
GM	8	8	5	5	B
LDj	8	8	5	6	D
CLj	8	5	8	2	Ca
LD	7	7	6	4	Cc
MK	8	5	8	8	Cb

Table 1: Raw scores - Experiment 1

Table 2 shows that patterns A, Ca, Cb and Cc combined, and D significantly discriminate between the question types:

	N of partic.	Subj. -DL	Subj. +DL	Obj. -DL	Obj. +DL	Chi Square	df [4]	P
A	2	6	5	16	15	9.524	1	0.002
C	7	51	37	48	34	4.612	1	0.04
D	5	40	37	16	35	11.063	3	0.02

Table 2: Total correct responses - participants with shared patterns

2.5 Discussion of Experiment 1

Our larger sample of aphasic subjects (with more homogenous disorders) calls into question the generality of Kljajević' findings. First, it is not the case that all Serbian-speaking Broca's patients perform above chance on all question types. Second, two participants had more difficulty with subject questions than with object questions, as Kljajević also found for two participants with mixed non-fluent aphasia. However, only one of these two in the present study was classified as mixed, non-fluent patient; the other was a Broca's patient. Third, we also found one participant who had (non-significantly) more trouble with object than with subject questions (Pattern B) and five subjects (Pattern D) showed lowest performance with non-D-linked object questions, suggesting a deficit in processing object case marking.

In addition, we also found that D-linking is a problem: subjects with Patterns Ca, Cb and Cc have more difficulty with one or both D-linked conditions. Thus we found a more general problem than the difficulty with D-linked object questions found by Hickok and Avrutin (1995, 1996).

3 Experiment 2

3.1 Background

The discussion above does not help solve the question of what the deficit that Broca's patients have. In this section, we address the proposal of

[4] df = 1 (degree of freedom) when a comparison was made between two conditions and two others (in the case of pattern A, the two subject conditions vs. the two object conditions; and in the case of pattern C, the two –DL conditions vs. the two +DL conditions). df = 3 when all four conditions are treated separately in the analysis (pattern D).

Avrutin (2000): that Broca's patients may have trouble computing Binding Chains, leading (in combination with a strategy whereby the first NP is treated as agent) to a particular difficulty with +DL object questions. Although the patterns found in Experiment 1 cannot be accounted for by this single explanation, nonetheless some individuals, such as those tested by Hickok and Avrutin and others in the subsequent studies, may have difficulty with Binding Chains.

Serbian offers the possibility to test this explanation, since it has questions formed by pronominal binding. *Koga* questions such as those (5-8) are formed by movement, as evidenced by sensitivity to island constraints. For example, a *koga* question cannot penetrate an indirect question, as shown the ungrammaticality of (9),

(9) *Koga$_i$ će Jelena pitati kada će posetiti t_i?
Who$_{ACC}$ will Jelana ask when will visit
'Who will Jelena ask when she/they will visit?'

In (9), the question word is moved from object position of the embedded clause. (9) is not made better if a resumptive pronoun (*ga*) is added to the embedded sentence.[5]

However, there is a type of question in Serbian which permits reference into an embedded question. (10), with the preposition *za* preceding *koga,* contrasts with the ungrammatical (9),

(10) Za koga$_i$ će Jelena pitati kada će ga$_i$ posetiti?
For whom will Jelena ask when will him visit

The resumptive pronoun *ga*, coreferential with the question phrase, is obligatory in (10). In the analysis of Goodluck and Stojanović (1996), *za koga* questions use pronominal coreference between the *za koga* phrase and the resumptive pronoun, i.e. a binding chain.[6] The pronominal

[5] The reading of example (9) as ungrammatical entails that *pitati* does not take a direct object. If *koga* is moved from the object position of *pitati,* (9) can be construed as grammatical with *ga*, since *koga*/t can then be bound to the pronoun. In the materials in (11) below, the possibility of co-reference between *koga* and *ga* is excluded by the content of the story.

[6] The derivation Goodluck and Stojanović give is more complex. *Za koga* is selected for by the main verb, and moves from the Spec CP of the embedded clause; it is then co-indexed with the resumptive pronoun, which has itself been moved from object

binding relation between *za koga* and the pronoun in the subordinate clause opens the way for obviation of the island effect created by an embedded question.

3.2 Participants

The participants were the same twenty aphasic patients tested in Experiment 1. A group of 17 unimpaired adults were also tested, to ensure that participants made a distinction between the sentence types in the experiment under the testing conditions described below (which were somewhat different from a previous study of children and unimpaired adults by Goodluck et al. 1996).

3.3 Materials and Procedure

Participants were asked questions following a short story. The questions used either *koga* or *za koga* to target an object position (for which the correct response was the matrix object in the case of *koga* and the embedded object in the case of *za koga*). An example is given in (11):

(11) *Zoran i Vesna razgovaraju o tome šta će raditi na leto.*
Zoran and Vesna talk about what will do in summer
'Zoran and Vesna are talking about what will they will do in the summer'

Zoran hoće da idu kod dede na selo.
Zoran want to go to grandad in village
'Zoran wants to go to grandad's in the village'

Zoran kaže: "Pitacu tatu kada ćemo posetiti dedu"
Zoran say ask dad when will visit granddad
'Zoran says: "I'll ask dad when we will visit granddad" '

Ovo je njihova kuća na selu.
Here is their house in country
'Here is their house in the country.'

---

position to pre-auxiliary position (see Goodluck and Stojanović 1996, p. 292-5; fn. 8 gives syntactic justification for this analysis).

Koga question:

Koga će Zoran pitati kada će ga posetiti?
Who will Zoran ask when will him visit
'Who will Zoran ask when he/they will visit him'

Correct interpretation: For which person x will Zoran ask x when he/they will visit y.
Correct answer: *tatu* (dad)

Za koga question:

Za koga će Zoran pitati kada će ga posetiti?
'Za' who will Zoran ask when will him visit.

Correct interpretation: For which person x will Zoran ask y when he/they will visit x.
Correct answer: *dedu* (granddad)

There were twelve stories, six with an embedded question with the question word *kada* ('when'), and six with *da li* ('if'). Only one main verb was used (*pitati* 'ask'), because the range of verbs that can take *za koga* is very limited and difficult to incorporate in the question response task. Both the *koga* and *za koga* questions were asked for each context story; in half the stories the *koga* question was asked first, and in the other half the *za koga* question was asked first. Two questionnaires were used, so that half the participants responded to an individual story with the *koga* question presented first and half with the *za koga* question first. The participants listened to the stories, which were accompanied by pictures in a booklet. The last picture was 'neutral' with respect to the correct answer (for example, for the story in 11, it was a picture of a house). The experimenter turned the pages of the booklet as she read the story, and presented the question together with the last picture.

3.4 Results

The unimpaired participants showed a categorical distinction between *koga* and *za koga* questions, 96% correct for *koga* and 95% correct for *za koga*. Although the level of performance was lower, the aphasic participants also showed a clear cut distinction, with 83% correct for *koga* and 85% correct for *za koga*. The participants who had problems with D-linking (Patterns Ca, Cb and Cc) scored 81% correct for *koga* and 75% correct for *za koga* questions. Neither the difference for all

participants or those who experienced difficulty with D-linking is significant.

3.5 Discussion of Experiment 2

Experiment 2 argues against an explanation that appeals to binding chains for the fact that some aphasic patients find questions involving +D-linked phrases difficult. Aphasic speakers are as adept at processing *za koga* questions as they are at processing *koga* questions, and yet *za koga* questions are formed by a pronominal binding mechanism.

4 General Discussion

The particular pattern of D-linked object questions being more difficult that other questions has not been borne out in Experiment 1 or in other earlier studies, except for a minority of participants (see section 2). However, there *is* evidence that D-linking in general may increase the difficulty that Broca's patients have. This may be taken as a reflection of difficulty in processing discourse information, rather than of computing Binding Chains per se, a hypothesis that Experiment 2 argues to be incorrect. Goodluck (1990) and Avrutin (2000) both argue that a range of data from child language studies leads to the conclusion that the integration of discourse information challenges child learners.[7] Our Experiment 1 and earlier studies provide evidence that this may be true of some aphasic patients also.

This study has also found one previously little documented pattern of data. In particular, we found in Experiment 1 greater difficulty for subject (as opposed to object) questions for two of our participants; as noted in section 2.1, that pattern was also found for two mixed non-fluent patients studied by Kljajević (2012). Only one of our participants was classified as mixed non-fluent, the other was classified as a Broca's patient. The source of this pattern remains an open question. Is it due to the greater salience of some instances of case marking, as suggested by Kljajević? Or does the greater ease of object vs. subject questions (or its opposite pattern) derive from differing attentional focus on different

[7] We are as yet at an early stage in understanding the precise nature of D-linking effects. Work by Goodluck (2005) and Donkers et al. (2013), on child and adult subjects respectively, suggests that it is not the syntax of D-linking per se that leads to greater difficulty with +DL phrases, but rather their semantic content.

portions of the sentences? In order to support the attentional focus hypothesis, we need an independent measure of attention to portions of the stimulus, which must await further research. This hypothesis has the advantage in principle of covering a wider range of patterns in the data: if a correlation is found between attentional focus and particular response patterns, it may in part support an explanation of patterns A vs. B and also Cb vs. Cc in Experiment 1.

A more general moral from this study is that there is the danger of relying on studies of a small number of aphasic patients. As Salis and Edwards (2008, p.389) note "the differences between Avrutin's group [=Hickok and Avrutin 1995 and Thompson et al. 1999] and our group show how small samples can generate contradictory data".

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Embracing the Differences: the Three Classes of Russian Ditransitives*

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In this paper I show that if we assume the Scope Freezing Generalization (SFG) proposed in Antonyuk 2015 and use quantifier scope distribution patterns as a diagnostic tool to probe into the argument structure of ditransitives, we obtain important new insights. This diagnostic suggests that Russian ditransitives are not a homogeneous class but are subdivided into three Groups, each with its own set of syntactic properties.

1 The Non-Homogeneity of Russian Ditransitives

The internal structure of ditransitives remains one of the most debated topics in Russian syntax, with most of the competing views on the proposed structure summarized below:

(1) a. Dative Goal object originates in Spec, VP position, assigned Dative case as sister to V' (see Harbert & Toribio 1991; Greenberg & Franks 1991; Franks 1995 i.a.).
b. Accusative Theme object is generated in Spec, VP position, with the Dative originating in the complement position (Bailyn 1995, 2012).

* I gratefully acknowledge useful commentary by John Bailyn, Danny Fox, Daniel Finer, Kyle Johnson, Richard Larson, Lucas Champollion, Jiwon Yun as well as the audience at FASL 25 held at Cornell University. All mistakes remain my own.

c. Dative Goal object is assigned case by an Applicative head (Dyakonova 2005, 2007, following Pylkkänen 2002).

I argue that the issue of the internal structure of ditransitives is more complicated than in the above accounts, as Russian ditransitives subdivide into three distinct Groups, each characterized by a specific set of properties, which warrant a different structure for each Group.

The subdivision of predicates into the three Groups (schematized in (2a), exemplified in (2b)) is based on the predicates' quantifier scope ambiguity and scope freezing distribution patterns, coupled with the SFG (see (7)).

(2) a. The three Groups of Russian ditransitives, schematized:

Group 1:

V	NP-ACC	NP-OBL	BASIC ORDER	(ambiguous)
V	NP-OBL	NP-ACC <NP-OBL>	DERIVED ORDER	(frozen)

Group 2:

V	NP-OBL	NP-ACC	BASIC ORDER	(ambiguous)
V	NP-ACC	NP-OBL <NP-ACC>	DERIVED ORDER	(frozen)

Group 3:

V	NP-CASE1	NP-CASE2	BASIC ORDER	(ambiguous)
V	[...NP-CASE2...]	NP-CASE1	DERIVED ORDER	(ambiguous)

b. Example predicates belonging to the three Groups:

Group 1:

i. najti DAT/ACC – to find (smb smth)
ii. potrebovat' s/ACC – to demand (from smb smth)
iii. napisat' k/ACC – to write (to smb smth)
iv. prostit' DAT/ACC – to forgive (smb smth)
v. sdelat' DAT/ACC – to do (smb smth)

Group 2:

i. oskorbit' ACC/INSTR – to insult (someone with smth)
ii. podvergnut' ACC/INSTR – to subject (someone to smth)
iii. izobličit' ACC/v – to expose (smb in smth)
iv. zašč'itit' ACC/ot – to protect (sb from smth/smb)
v. zapolnit' ACC/INSTRT – to fill (smth with smth)

Group 3:
i. zapisat' ACC/v or on – to write down (smth in/somewhere/on smth)
ii. vyrastit' ACC/v – to grow (smth in/somewhere)
iii. pročitat' ACC/DAT – to read (smth to smb)
iv. otpravit' ACC/na – to send (smth to)
v. uslyšat' o/ot – to hear (about smth from smb)

As is well known, English Dative Constructions ((3a), (4a)) and Double Object Constructions ((3b), (4b)) show a peculiar QP scope pattern, in which the former are scopally ambiguous and the latter scopally frozen (Larson 1990), verified by the inability of the modifier *different* to distribute beneath in Double Object Constructions (4b). The same pattern is observed in the *Spray-Load* alternation, with the *with*-variant of the construction disallowing inverse scope or wide scope for the lower QP.

(3) a. The teacher gave a book to every student. $(\exists > \forall), (\forall > \exists)$
b. The teacher gave a student every book. $(\exists > \forall), *(\forall > \exists)$

(4) a. The teacher gave a different book to every student. $(\forall > \exists)$
b. #The teacher gave a different student every book. $*(\forall > \exists)$

(5) a. Maud draped a (different) sheet over every armchair. $(\forall > \exists)$
b. Maud draped a (#different) armchair with every sheet. $*(\forall > \exists)$

Compared to English, Russian shows a much wider range of constructions where scope is surface frozen, listed in (6):

(6) a. ditransitives
b. *Spray-Load* alternation
c. *Spray-Load* type verbs where scope freezing is the result of simple reordering of quantificational arguments
d. "reflexive monotransitives"
e. long-distance scrambling of QPs
f. local scrambling of QPs

The question then is, which property renders certain constructions scopally frozen? Distinct possibilities have been considered for both English (Bruening 2001, Johnson 2001) and Russian (Antonyuk-Yudina

2009). The constructions in (6) provide a novel way of answering this question.[1] Antonyuk (2015; 2017) argues that the answer is crucially provided by the scope freezing found in Scrambling contexts, and further supported by the scope distribution in the rest of the above constructions, prompting (7):

(7) ***The Scope Freezing Generalization:***
Scope freezing always results from overt raising of one QP over another to a c-commanding position as a result of a single instance of movement.

According to SFG, scope freezing obtains in the constructions in (6) due to the structurally lower QP having overtly moved (scrambled) over the structurally higher one to a c-commanding position. Having justified the SFG elsewhere, here I show that it gives us a powerful new diagnostic tool that provides insights into the structure of Russian ditransitives.

2 The Finding: Three Groups of Russian Ditransitives

2.1 The Three Groups of Ditransitives Exemplified

Most Russian ditransitive predicates (except those rare ones that do not alternate) are grammatical and truth-conditionally identical on either order of internal arguments. If we consider QP scope when both internal arguments are QPs, we see that the predicates fall neatly into one of the three Groups in (2a) based on scope ambiguity and scope freezing patterns. Group 1, as in (8), consists of verbs for which the Acc > Obl order of internal QP arguments yields ambiguity whereas the opposite order yields frozen scope. Group 2, as in (9), exhibits frozen scope when the order of arguments is Acc > Obl, essentially a mirror image of Group 1 in terms of scope. Finally, Group 3 predicates, as in (10), show

[1] I cannot provide examples of scope freezing for the constructions in (6) for reasons of space (but see Antonyuk 2017, Antonyuk 2015 for detailed discussion). It must be stressed that the validity of SFG is based primarily on those facts, which strongly suggests that Group 3 predicates are not a counterexample to SFG (as suggested by a reviewer) and thus that there must be an independent reason for the ambiguity of Group 3 predicates with both orders of internal arguments.

ambiguous scope on either order of internal argument QPs[2].

(8) a. Maša našla [kakuju-to knigu] (každomu studentu)
Masha found [some book]$_{ACC}$ [every student]$_{DAT}$
'Masha found some book for every student'
(∃ > ∀), (∀ > ∃)

b. Maša našla (kakomu-to studentu) [každuju knigu]
Masha found [some student]$_{DAT}$ [every book]$_{ACC}$
'Masha found some student every book'
(∃ > ∀), *(∀ > ∃)

(9) a. Maša obeskuražila (kakim-to postupkom)[každogo opponenta]
Masha discouraged [some act]$_{INSTR}$ [every opponent]$_{ACC}$
'Masha discouraged with some act every opponent'
(∃ > ∀), (∀ > ∃)

b. Maša obeskuražila [kakogo-to opponenta]
Masha discouraged [some opponent]$_{ACC}$
(každym postupkom)
[every act]$_{INSTR}$
'Masha discouraged some opponent with every act'
(∃ > ∀), *(∀ > ∃)

(10) a. Maša zaveščala [*(kakoe-to imenie)] [*(každomu drugu)]
Masha bequeathed [some estate]$_{ACC}$ [every friend]$_{DAT}$
'Masha bequeathed some estate to every friend'
(∃ > ∀), (∀ > ∃)

b. Maša zaveščala [*(kakomu-to drugu)] [*(každoe imenie)]
Masha bequeathed [some friend]$_{DAT}$ [every estate]$_{ACC}$
'Masha bequeathed to some friend every estate'
(∃ > ∀), (∀ > ∃)

---

[2] An anonymous reviewer objects to the fact that in pairs of sentences in (8)-(10) and others like them the relative position of the existential and the universal QPs is altered along with the word order of the internal arguments, treating this as a confound in our attempt to determine the effect of word order on scope. The change in the relative position of the existential and the universal QP in each pair of sentences in (8)-(10) is, however, necessary due to the different ways universal and existential quantifiers are interpreted, the standard practice dictating that the existential QP always be kept in a structurally higher (c-

QP scopes are notoriously difficult for some people to distinguish, so one may seek an independent way to verify these claims about Russian ditransitives. As it turns out, a number of tests can be used to verify the judgments.[3]

2.2 The Contrastive Focus Test

One test that is quite informative for our purposes is the use of contrastive focus intonation on the structurally lower object determiner. Results from this test are robust and consistent with the conclusions suggested by the passivization test, discussed below, as well as other tests discussed in Antonyuk 2015.

2.2.1 Group 1. The effect of contrastive focus in scopally ambiguous ditransitives is unequivocal: in sentences that are scopally ambiguous, contrastively focusing the second object (marked with capital letters on the stressed syllable) results in wide scope for the focused objects (marked "F>" throughout). In sentences that are scope frozen, such as all the (b) sentences below, focusing the lower object determiner results in obligatory narrow scope for the focused object (marked "F<").

(11) a. Vanja prines [kakuju-to novost'](KAždoj sem'e) F>
Vania brought [some news]$_{ACC}$ [every family]$_{DAT}$
'Vania brought some piece of news to every family'

b. Vanja prines (kakoj-to sem'e) [KAžduju novost'] F<
Vania brought [some family]$_{DAT}$ [every news]$_{ACC}$
'Vania brought some family every piece of news'

2.2.2 Group 2. The Group 2 predicates, exemplified in (12) below, behave in exactly the same way with respect to contrastive focus:

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commanding) position with respect to the universal QP in situations where their relative scope is in question (see Pietroski and Hornstein 2002 for a detailed discussion and justification).

[3] Antonyuk 2015 discusses additional tests. The ACD test in particular is effective in showing what we already know from English, namely that the lower object QP in a scopally frozen sentence undergoes QR but remains below the structurally higher QP at LF, that is, scope freezing is a *relative*, rather than an absolute limitation on scope (see Bruening 2001 for details).

(12) a. Maša obozvala (kakim-to prozviščem)[KAždogo mal'čika] F>
Masha called [some nickname]$_{INSTR}$ [every boy]$_{ACC}$
'Masha called every boy by some nickname'
b. Maša obozvala [kakogo-to mal'čika](KAždym prozviščem) F<
Masha called [some boy]$_{ACC}$ [every nickname]$_{INSTR}$
'Masha called some boy by every nickname'

Although Groups 1 and 2 are mirror images of each other with respect to which order of internal arguments yields frozen surface scope, they behave alike with respect to scope in contrastive focus contexts: in both Groups contrastive focus on the quantificational determiner of the lower QP in ambiguous sentences forces wide scope for the focused object while in frozen scope sentences, scope is unaffected by focus. [4]

2.2.3 Group 3. Group 3 is predictably different, in that both orders of internal predicates (which are scopally ambiguous) in contrastive focus contexts yield wide scope for the focused phrase.

(13) a. Maša napisala [kakoj-to slogan] (na KAždoj stene) F>
Masha wrote [some slogan]$_{ACC}$ [$_{PP}$ on [every wall]$_{DAT}$]
'Masha wrote some slogan on every wall'
b. Maša napisala (na kakoj-to stene) [KAždyj slogan] F>
Masha wrote [$_{PP}$ on [some wall]$_{DAT}$] [every slogan]$_{ACC}$
'Masha wrote every slogan on some wall'

Thus, while in scopally ambiguous sentences contrastive focus on the second object forces wide scope for the focused phrase, in scopally

[4] As argued by Antonyuk and Larson (in progress), such facts point to two distinct mechanisms of scope disambiguation, that due to contrastive focus (as shown in examples above) and whichever mechanism is responsible for surface scope freezing effects known since Larson 1990, with focus being unable to disrupt whatever causes Larson-type scope freezing in surface scope frozen ditransitives. This observation is an important one, and in the view of Antonyuk and Larson can ultimately help us zero in on the right account of surface scope freezing. All that is important for our purposes here, however, is that the contrastive focus test can be used as an effective way of sharpening/verifying scope judgments.

frozen sentences focus is not able to override whatever restrictions on scope exist in frozen contexts.

2.3 The Passivization Test

Along with the Contrastive Focus test, passivization appears to sharpen judgments. In some cases, passivizing the "higher" object in a sentence that initially seemed scope frozen would suddenly "free" scope so that the inverse scope reading would become salient.[5] In sentences that are truly scope frozen, however, passivizing the higher object does not free scope.[6]

2.3.1 Group 1. Consider the Group 1 predicates. In sentences that are initially ambiguous, passivization makes inverse scope, or wide scope for the lower object, much more salient (in the Focus test, inverse scope preference is so strong as to suggest it is the only reading available). In the frozen sentences inverse scope, predictably, does not become available. It is this contrast in the effect of passivization on the former and the latter type of sentences that makes this test useful for verifying scope judgments.[7]

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[5] By passivization (of either object) I mean advancement of the relevant object to the front of the sentence in a passive construction; it should be noted, however, that only the Accusative object is truly passivized (by going into Nominative) while an oblique object (e.g., Dative or Instrumental) retains its case even is its advanced position.

[6] Another fact that is important for us to note here is that the contrastive focus test and the passivization test (as well as the ACD test discussed in Antonyuk 2015) always yield consistent results with regard to which sentences are judged scopally ambiguous and which are confirmed to be scope frozen; the fact that such distinct tests all yield the same results lends further credibility to the empirical claims made here.

[7] The parenthesized phrase is used to mark either an adjunct or an argument phrase that can be dropped without ungrammaticality. Still, its presence in implied; that is, the meaning is that of an elliptical sentence with an unpronounced constituent. The true adjuncts, however, have similarly been parenthesized.

(14) a. [Kakoj-to document] byl potrebovan [s každogo posetitelja]
[Some document]$_{NOM}$ was demanded [$_{PP}$ from [every visitor]$_{GEN}$]
'Some document was demanded from every visitor'
(∃ > ∀), (∀ > ∃), inverse preferred

b. [S kakogo-to posetitelja] byl potrebovan [každyj document]
[$_{PP}$ From [some visitor]$_{GEN}$]was demanded [every document]$_{NOM}$
'From some visitor was demanded every document'
(∃ > ∀), *(∀ > ∃)

2.3.2 Group 2. The same effect is observed with Group 2 predicates:

(15) a. (Kakim-to postupkom) byl obeskuražen [každyj opponent]
[Some act]$_{INSTR}$ was discouraged [every opponent]$_{NOM}$
'Every opponent was discouraged by some act'
(∃ > ∀), (∀ > ∃)

b. [Kakoj-to opponent] byl obeskuražen (každym postupkom)
[Some opponent]$_{NOM}$ was discouraged [every act]$_{INSTR}$
'Some opponent was discouraged by some act'
(∃ > ∀), *(∀ > ∃)

2.3.3 Group 3. Finally, Group 3 is again the one where additional tests such as this one are the most informative. As shown in (16b), the presence of the inverse scope is in question, with the sentence seemingly being surface scope frozen. However, passivizing the Dative object in this sentence yields (16d), where inverse scope becomes highly salient.

(16) a. Maša porekomendovala [kakuju-to proceduru][každoj pacientke]
Masha recommended [some procedure]$_{ACC}$ [every patient]$_{DAT}$
'Masha recommended some procedure to every patient'
(∃ > ∀), (∀ > ∃)

b. Maša porekomendovala [kakoj-to pacientke][každuju proceduru]
Masha recommended [some patient]$_{DAT}$ [every procedure]$_{ACC}$
'Masha recommended some patient every procedure'
(∃ > ∀), ??(∀ > ∃)

c. [Kakaja-to procedura] byla rekomendovana [každoj pacientke]
[Some procedure]$_{NOM}$ was recommended [every patient]$_{DAT}$
'Some procedure was recommended to every patient'
(∃ > ∀), (∀ > ∃)

d. [Kakoj-to pacientke] byla rekomendovana [každaja procedura]
[Some patient]$_{DAT}$ was recommended [every procedure]$_{NOM}$
'To some patient was recommended every procedure'
(∃ > ∀), (∀ > ∃)

Thus, there is evidence for the three Groups suggested in (2a) in Russian ditransitives. Moreover, we have seen that tests such as the use of contrastive focus on the lower quantificational determiner and passivization of the higher object in a (potentially) surface scope frozen structure can significantly sharpen the judgments, showing where scope is indeed frozen and where it only appears to be so.

3 The Proposed Structures for the Three Groups of Predicates

Here I argue that we need to posit distinct structures to represent the three Groups of Russian ditransitives based on observed differences between the groups that extend beyond scope.

3.1 The Structure for Group 1 Predicates

To remind the reader, Group 1 predicates are those where scope is frozen on Obl > Acc order and free on the Acc > Obl order. Given SFG, repeated in (17), we expect the former to be derived from the latter via an instance of overt movement of the lower Oblique QP across the higher Accusative object QP.

(17) ***The Scope Freezing Generalization:***
Scope freezing always results from overt raising of one QP over another to a c-commanding position as a result of a single instance of movement.

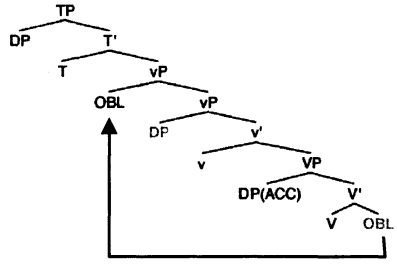
Thus, given SFG two kinds of analyses appear to be logically possible:[8]

[8] Following Antonyuk 2015, I assume that the frozen scope order is derived via overt Topicalization-like movement and that in most cases ambiguous scope is

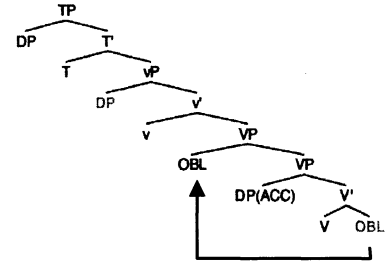
(18) a. OBL has been topicalized to an adjoined position.
b. OBL has been raised to spec of an applicative head.

In (18a), two possibilities are in principle available. Either the structurally lower Oblique QP overtly raises and adjoins to vP (19a), or, it raises to a lower position, adjoining to VP (19b).

(19)



a. Oblique argument raises to vP



b. Oblique argument raises to VP

To get the word order to work out correctly with the structure in (19a),

an indicator of non-derived order (though see the discussion of ambiguous OVS orders in Antonyuk 2015 as well as the discussion of Group 3 predicates in this paper).

we need to assume that the lexical verb routinely raises to T in Russian – a non-standard assumption.[9] On the structure in (19b), V to T raising is not required. Consider also the distribution of Agent-oriented adverbs ("deliberately", "purposely", "willingly", etc.), which are typically assumed to adjoin to vP where the Agent role is introduced or checked. The structure in (19a) predicts the possibility of either order: ADV > OBL or OBL > ADV, depending on the order in which one adjoins ADV vs. OBL. Testing this prediction with one of our Group 1 predicates, presented earlier, we get the following results:[10]

(20) a. Maša special'no potrebovala s Ivana den'gi
Masha purposefully demanded from Ivan_{GEN} $\text{money}_{\text{ACC}}$
'Masha demanded money from Ivan'
b. *Maša potrebovala s Ivana special'no den'gi
Masha demanded from Ivan_{GEN} purposefully $\text{money}_{\text{ACC}}$

---

[9] See King 1995, Bailyn 1995, (cf. Bailyn 2004) and Bailyn 2012 for an extensive discussion of the issue. Experimental results reported in Kallestinova and Slabakova 2007 similarly suggest the verb does not undergo raising to T in Russian.

[10] An anonymous reviewer argues that the sentence in (20b) is ungrammatical because the adverb does not c-command the V in (20b) and that reordering Adv and V renders the sentence grammatical, offering the following example:

(i) Maša s Ivana special'no potrebovala den'gi.

Note, however, that the reviewer is mistaken is treating this as an issue of c-command: the adverb c-commands the whole VP in (20a), hence it c-commands the verb as well. Furthermore, the sentence offered by the reviewer does not in fact involve reordering of Adv and V, as the relative order of the Adv and V is the same as in (20a), but it does involve scrambling (probably topicalizing) of the PP *s Ivana*, which has ostensibly vacated the VP, leading to a notable change in information structure. A sentence such as:

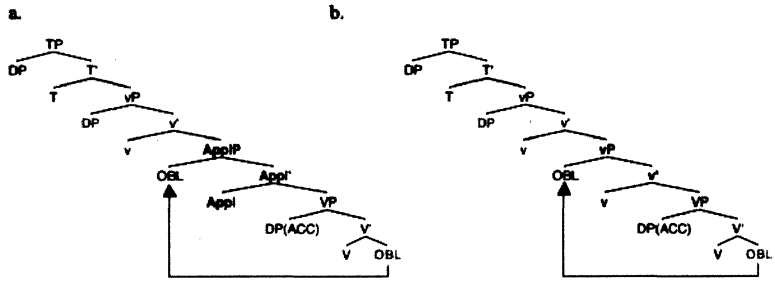
(ii) **Maša s Ivana potrebovala special'no den'gi*

in which the PP has vacated the VP as in the reviewer's example above and where the relative order of Adv and V has indeed been changed remains just as ungrammatical as (20b) above. Thus, the original argument remains unchallenged.

Thus, it appears that in terms of adjunction analyses, the structure in (19b) is much more closely aligned with the Russian data; it also happens to be the structure proposed for Russian ditransitives in Bailyn 1995, 2012, based on independent types of evidence; hence these results provide further support for Bailyn's original proposal.[11]

Another possibility for Group 1 predicates is that the lower Oblique overtly raises into the Spec position of an Applicative head. The two possibilities here seem to be these:

(21)



The only difference between these two structures is in how the applicative node is labeled (Appl vs. vP), in all other relevant respects the structures are identical and make the same predictions. Thus, for our Agent-oriented adverbs, both structures predict that the only order available should be ADV > OBL. As we have just observed, this prediction is supported by the data, so the Applicative structures in (21) fare equally well with respect to the data as the non-applicative, adjunction structure in (19b).

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[11] Note that this type of proposal implicitly or explicitly assumes that movement in question is Scrambling, specifically A-Scrambling (see Bailyn's arguments from binding, for instance). The obvious problem is why an adjoined position should have A, rather than A' properties. Currently I have no answer to this question. A very tentative suggestion is that the adjoined position is rather low, and possibly all adjunction that targets such a low position has A properties. This seems to be a testable prediction that should in principle be verifiable.

Clearly, the two types of accounts are distinct in spirit and in their assumptions. The Adjunction analysis, as noted, is essentially a Scrambling analysis, with Scrambling arguably being a non-feature driven, free operation licensed by Information-Structural needs (Bailyn 1995, but see Antonyuk-Yudina and Mykhaylyk 2013). The Applicative analysis, on the other hand, assumes that movement is driven by an edge feature, which requires the target of movement to raise to its Spec position and as such is an instance of motivated movement (Ormazabal and Romero 2010 and Larson 2014). It remains to be seen if our predictions can be made fine-grained enough to choose between these two analyses. At this point, both types of analyses seem to fit the bill in terms of the data and the crucial assumptions my analysis of scope freezing is based on.[12] Thus, at this point at least, choosing between the two analyses seems to be a matter of personal preference/conviction, rather than being required/justified by the data at hand.

3.2 The Structure for Group 2 Predicates

3.2.1 The possibilities. With Group 2 predicates we know from the SF Generalization that Oblique > Accusative is the basic word order. This yields two broad possibilities: either NP (ACC) is what it appears to be – a low direct object – or it isn't. A low direct object projected under an oblique would give the structure fundamentally that of an applicative under the non-derivational approaches of Marantz (1993), Pylkkänen (2000, 2002), i.a. This means one would need to adopt both a derivational approach to applicatives (for Group 1 predicates) and a non-derivational approach for Group 2 cases. While in principle possible, this seems conceptually undesirable.[13] But if NP (ACC) is not a direct object, what could it be?

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[12] The analysis of Russian scope freezing assumed here is discussed in detail in (Antonyuk 2017, Antonyuk 2015). Nothing in this paper, however, hinges on the details of that account and thus it will not be discussed here.

[13] Note that there is an independent problem with the Low Applicative structure argued for in Pylkkänen's work. As shown in Larson 2010, the Low Applicatives structure gives rise to incorrect inferences. As far as I am aware, this problem has never been resolved or even addressed in either Pylkkänen's work or in other accounts that assume this structure. I believe this issue to be serious and will therefore not discuss Low Applicatives as a possible structure for Group 2 predicates here.

Russian exhibits sentences of the form NP V OBL [$_{PP}$ P NP (ACC)], where the low Accusative object occurs inside a PP, getting its case from an overt preposition. This possibility suggests that our scopally frozen cases of the form NP V [NP (ACC)] OBL might be derived from a structure where [NP (ACC)] originates below the Oblique argument and is of the form [$_{PP}$ P NP (ACC)], with a null P head assigning Accusative case to what only appears to be a low direct object. The key question in resolving whether Group 2 predicates are better amenable to Marantz-style analysis or to the latter, silent PP style analysis will then revolve around determining the status of this NP (ACC).

In what follows I will argue for the silent PP analysis, according to which DP (ACC) is inside a null PP (the assumption will be justified a bit later in the section). Given this analysis, with respect to structural possibilities, the same derived structures seem to be most appropriate, given the underlying assumptions, as with the Group 1 cases. That is:

(22) a. [PP P DP(ACC)] can be taken to raise over OBL and adjoin to VP; or
b. [PP P DP(ACC)] can be taken to raise over OBL to the spec of ApplP or vP.

As was argued above, there seems to be no a priori reason to choose either one of these two possibilities without any additional evidence for Group 1. Assuming we want our analyses of the two Groups to be as parallel as possible, at this point in the discussion there seems to be no way to choose between (22a) and (22b) as an analysis of Group 2 verbs. So let us turn to the rather crucial assumption mentioned above, namely that the Accusative argument in all Group 2 cases is in fact inside a PP, with the null P head assigning Accusative case to it. This assumption is virtually forced on us, given the SF Generalization: the scope freezing on the DAT (ACC) > OBL word order means that this order is in fact derived from (23):

(23) V NP-ACC NP-OBL NP-ACC DERIVED ORDER (frozen)
_____/

Treating the structurally lower Accusative as generated inside a PP with

a null head assigning it case essentially means that we have a double oblique structure, and so the low position of this PP, with the Accusative object inside it, is not unorthodox. What we do have to worry about is whether this low Accusative shows the kinds of properties that we expect of it, namely whether it behaves as a non-object. As it happens, there is empirical evidence for this conclusion, demonstrating that the Accusative objects of Group 2 verbs have strikingly different properties from those of the Accusative direct objects belonging to Group 1.

3.2.2 Distributive *po*. Pesetsky (1982) noted that direct objects of transitive predicates and subjects of unaccusative predicates may appear as objects of distributive *po*, while subjects of transitive and unergative predicates typically may not. The distributive *po* test appears to be quite informative when applied to the three Groups of verbs:[14] it underscores that Group 2 predicates make up a separate class, distinct from Group 1 predicates. Thus, while Accusative objects of Group 1 verbs routinely appear as objects of distributive *po* (24), Accusative objects of Group 2 verbs all fail this test (25).[15]

(24) √ Maša potrebovala [**po** documentu] [s každogo posetitelja]
Masha demanded [**po** document]$_{DAT}$ [from [each visitor']$_{GEN}$]
'Masha demanded one document (each) from every visitor'

(25) *Maša obozvala [po malčiku] [každym prozviščem]

---

[14] I will only discuss the behavior of Group 1 and 2 verbs; in general, Group 3 verbs pattern together with Group 1 verbs with respect to all tests.

[15] An anonymous reviewer contests my conclusion about the non-object-like behavior of the Accusative-marked object of Group 2 predicates noting that changing the word order and aspect improves the example in (25), citing the following example

(i) ?Maša obzyvala [každym prozviščem] [po (odnomu) mal'čiku].

I disagree with the reviewer's judgments regarding the near-acceptability of this sentence; I find it to be as ungrammatical as the original example in (25). Furthermore, it should be stressed that the conclusion about the non-object-like behavior of Group 2 "direct objects" is not based on this test alone, but is cumulative. It is also supported by the parallel contrast found with respect to the Genitive of Negation test, discussed next, as well as with regard to the resultative test and other novel tests, discussed in Antonyuk (in progress).

Masha called [po boy]$_{DAT}$ [every nickname]$_{INSTR}$
'Masha called each boy by a nickname'

3.2.3 Genitive of Negation. Pesetsky (1982) also argued that Genitive of Negation can be used as a reliable test for unaccusativity in Russian. Applying this test to our data we again see a clear dichotomy between Group 1 (26) and Group 2 (27) predicates. [16]

(26) √ Maša ne potrebovala fotografii/služanki
Masha not demand photograph$_{GEN}$/made$_{GEN}$
'Masha did not demand a photograph/a made'
(27) * Maša ne obozvala fotografii/ služanki
Masha not call$_{PST}$ (by a bad name) photograph$_{GEN}$/made$_{GEN}$
'Masha did not insult a photograph/a made'

The tests we have just reviewed strongly suggest that direct objects of Group 1 predicates behave like true objects (i.e., originate in direct object position), while the Accusative-marked Group 2 objects behave as if they originate in a different position that lacks properties expected of true direct objects. This is of course in line with the proposal that the Accusative-marked objects of Group 2 verbs originate low, inside a PP whose null head assigns the Accusative case.

The structural possibilities themselves, as noted, appear to be quite similar to those available for Group 1 verbs. Thus, at this point I think it remains possible to argue for either type of analysis for both Group 1 and Group 2 verbs.

3.3 The Structure of Group 3 Predicates

Group 3 predicates differ from both Group 1 and Group 2 in that either order of internal arguments results in ambiguous scope. Given SFG and the resulting derivational approach to ditransitives' argument structure, one possibility is that the two orders of internal arguments are not derivationally related, that is, that they are independently projected. However, this is not the only way to view the situation. On the

[16] The examples below have been changed to keep the animacy feature constant as Glushan (2013) argues that GenNeg is largely about animacy rather than unaccusativity. I am grateful to a reviewer for bringing this to my attention.

assumption that freezing results as long as the overtly moved quantifier c-commands the other one post-movement, there are in fact two possibilities to consider:[17,18]

(28) a. Scope ambiguity is due to the structure being underived, with no overt movement.
b. Ambiguity results from a derived structure where the c-command condition is not met post-movement.

3.3.1 Independent derivation. There are plausible cases of independent derivation known from English, such as (29):

(29) a. Job blamed [God] [for his troubles] (Larson 1990)
b. Job blamed [his troubles] [on God]

What makes these good candidates for independent derivation is that along with the change in the order of the two internal arguments, there is also clearly a change in grammatical relations, with 'God' being a DO in (29a) but an oblique in (29b). As noted by Richard Larson (p.c.), the corresponding examples with quantificational phrases are both ambiguous, as should be expected under my analysis:

(30) a. John blamed some employee for every mistake. (∃ > ∀), (∀ > ∃)
b. John blamed some mistake on every employee. (∃ > ∀), (∀ > ∃)

The fact that the thematic roles involved in the two alternations are different in the above cases supports the idea that they are not derivationally related. This poses a problem for the analysis of Group 3 ditransitive alternations as derivationally unrelated, since none of them

[17] The possibility in (28b) was originally pointed out to me by Richard Larson (p.c.)

[18] A distinct third possibility, suggested by the results in Antonyuk (2015) regarding the lack of scope freezing with Russian OVS sentences (and possibly passives as well), is that although the overtly raised QP ends up in a c-commanding position post-movement, the movement itself is not of the kind required for freezing, that is, the QP is "smuggled" to its high position inside a larger piece of structure.

show a parallel difference in thematic roles. The only differences seem to relate to the information status of the two internal arguments; their thematic roles always stay the same. Thus, it is worth considering other alternatives.

3.3.2 On the "derived orders" analysis of Group 3 predicates there are again two options to consider. Consider the English pair in (31):

(31) a. John gave [a cute little puppy] [to Mary].
b. John gave [to Mary] [a cute little puppy].

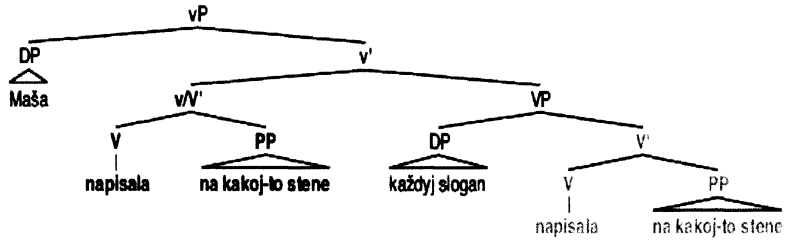
These are closer to our Russian examples in that there is no change in thematic roles in the two alternants. The analyses offered for such sentences in English have been quite distinct, however; for example, they have been analyzed as instances of Heavy NP Shift, whereby the order in (31b) is derived via rightward movement of the "heavy" object, with adjunction at either VP or vP level. On the standard assumption that in the basic, non-derived form, the direct object c-commands the indirect one, as well as continues to c-command the indirect object in its Heavy NP-shifted position, no crossing of the relevant kind would take place, hence we correctly predict no scope freezing. However, HNPS is generally known to come with information-structural consequences, as well as involve "heavy" objects, both of which are absent in the arguably derived alternant with Group 3 predicates, thus this analysis, although theoretically possible, does not seem highly plausible.

The other possibility, laid out in Larson 1989, is the Light Predicate Raising (LPR) Analysis. What is crucially important in relation to my analysis, is that LPR configuration does not lead to the raised PP/DP being able to c-command the other phrase, by virtue of the interfering v/V' node. To demonstrate with a Russian example with quantifiers, repeated here as (32), we will get the following configuration (33):[19]

[19] Space limitations do not allow me to provide a justification of the LPR analysis or the assumed structures here. See Larson 1989 for the original discussion.

(32) Maša napisala (na kakoj-to stene) [každyj slogan]
Masha wrote [$_{PP}$ on [some wall]$_{PREP}$] [every slogan]$_{ACC}$
'Masha wrote every slogan on some wall' (∃ > ∀), (∀ > ∃)

(33)



Such an analysis appears promising, given that both alternations in all Group 3 cases such as those in (32) are scopally ambiguous and truth-conditionally identical, and show no change in thematic relations or in case relations upon alternation.

4 Conclusions

Russian QP scope does not just provide insights into how QR interacts with overt movement, it can also be used as a tool for probing the argument structure of ditransitives. The Scope Freezing Generalization based on Russian QP scope distribution data, as a diagnostic, strongly suggests that Russian ditransitives make up three distinct Groups, with different syntactic properties exhibited by each. Additional syntactic tests also suggest that we need to posit distinct structures for the three Groups. The Russian scope data coupled with SFG also suggest that while no single structure can be proposed for Russian ditransitives, the account of Russian ditransitives is nevertheless distinctly derivational, providing partial support for Bailyn's (1995), (2012) account of Russian ditransitives. The finding of the non-homogeneity of Russian ditransitives as a class has implications for other languages showing scope freezing in ditransitives (English, Korean, Japanese, etc) that can be tested using this methodology.

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Case Syncretism in Russian, Polish and Czech ATB Constructions*

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This article investigates case syncretism in Across-the-Board (ATB) constructions in Russian, Polish and Czech. It provides some new ATB data, which are problematic for most current approaches dealing with ATB constructions. It is proposed to derive ATB constructions by means of two (or more) independent movements and haplology reduction.

1 Introduction

It has been argued that ATB dependencies with conjuncts that demand different cases result in ungrammaticality (see Borsley 1983, Dyła 1984 and Bondaruk 2003, among others). For instance, example (1) is ungrammatical because the verb *lubi* assigns accusative and the verb *nienawidzi* genitive.

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(1) * $Co_{NOM/ACC}$ Janek lubi t_{ACC} a Jerzy nienawidzi t_{GEN}?
what Janek likes and Jerzy hates
(Polish, Dyła 1984:702)

However, it has been also observed that syncretism can repair illicit case mismatches (e.g. Dyła 1984, Franks 1993, 1995, Bondaruk 2003, Citko 2005, 2011). Thus, if distinct cases assigned in the syntax have the same morphological realization, the ATB construction becomes grammatical, as shown by the following example, in which *kogo* – in contrast to *co* in (1) – is syncretic for accusative and genitive.

(2) $Kogo_{ACC/GEN}$ Janek lubi t_{ACC} a Jerzy nienawidzi t_{GEN}?
who Janek likes and Jerzy hates
'Who does Janek like and Jerzy hate?'
(Polish, Borsley 1983:170, Dyła 1984:701)

The following examples show that Russian and Czech exhibit the same behavior. The relative clause ATB construction in (3a) is grammatical because *kotorogo* is syncretic for accusative and genitive – cases assigned by *ljubit'* and *boit'sja* – but (3b) is bad because the verb *verit'* assigns dative and the dative form *komu* is not syncretic with the accusative form.

(3) a. mal'čik, $kotorogo_{ACC/GEN}$ Maša ljubit t_{ACC} i Vera boitsja t_{GEN}.
boy who Maša loves and Vera fears
'the boy who Masha loves and Vera fears'
(Franks 1995:63)

b. * mal'čik, $kotorogo_{ACC/GEN}$ Maša ljubit t_{ACC} i Vera verit t_{DAT}.
boy who Maša loves and Vera trust

A similar example from Czech is shown in (4). When the accusative assigning verb *přijala* is replaced with the dative assigning verb *důvěřovala*, the ATB question with *koho* becomes ungrammatical; see (4b). In the same vein, when the syncretic *koho* 'who' is replaced with the genitive *čeho* 'what', which is not syncretic with the accusative form (*co*), the sentence also becomes ungrammatical, as demonstrated in (4c).

(4) a. Koho$_{ACC/GEN}$ se naše univerzita zbavila t_{GEN} a vaše
who self our university fired and your
univerzita přijala t_{ACC}?
university hired
'Who did our university fire and your university hire?'

b.* Koho$_{ACC/GEN}$ se naše univerzita zbavila t_{GEN} a vaše
who self our university fired and your
univerzita důvěřovala t_{DAT}?
university trust

c.* Čeho$_{GEN}$ se naše univerzita zbavila t_{GEN} a vaše
what self our university got.rid.of and your
univerzita přijala t_{ACC}?
university accepted

It has been also claimed that ATB movement is subject to an identity requirement (see Citko 2005, Reich 2009, Zhang 2010 and Salzmann 2012). Consider, for instance, the identity reading of example (2), on which the question is about a single individual. It can be represented as (5).

(5) For which person x, Janek likes x and Jerzy hates x?

The remainder of the paper analyzes these two properties of ATB constructions, morphological case matching and the (non-)identity reading.

2 (Non-)Identity Reading

A closer look at data reveals that, in fact, non-identity readings are also possible; consider, for instance, the following example from Czech (see also De Vries to appear).

(6) a. Jak rychle Marie běhá a Jirka plave?
how fast Marie runs and Jirka swims
'How fast does Marie run and Jirka swim?'[1]

[1] Because of lack of space, I will only use the ATB version of translations.

b. Marie běhá 7 km/h a Jirka plave 3 km/h.
Marie runs 7 km/h and Jirka swims 3 km/h
'Marie runs 7 km/h and Jirka swims 3 km/h.'

Example (6a) is not a question about an identical speed; it has the non-identity reading shown in (7). The reason for this is our world knowledge. Since humans run and swim at different speeds, (6a) can be answered by (6b).

(7) At what speed x, Marie runs at x and at what speed y, Jirka swims at y?

The non-identity reading is also possible with other adverbials, like locatives, as illustrated in the Polish example below (see also Munn 1999). Specifically, the ATB question in (8a) can be answered by (8b), with two distinct locative adverbials (the identity reading is also possible).

(8) a. Gdzie pracuje Maria i robi zakupy Janek?
where works Maria and does shopping Janek
'Where does Maria work and Janek do the shopping?'
b. Maria pracuje na centralnej poczcie i Janek robi
Maria works on central post and Janek does
zakupy w supermarkecie Stokrotka.
shopping in supermarket Stokrotka
'Maria works in the central post office and Janek does the shopping in the supermarket Stokrotka.'

Consider also the Russian example in (9), showing that the question with the ATB-moved *kogda* can be answered by a sentence with temporal adverbials referring to two different time intervals.

(9) a. Kogda Ivan opublikoval tu knigu, a Artur
when Ivan published the book and Artur
otrecenziroval?
reviewed
'When did Ivan publish the book and Artur review it?'

b. Ivan opublikoval tu knigu v 2011 g., a Artur
Ivan published the book in 2011 yr. and Artur
otrecenziroval eë v 2013 g.
reviewed it in 2013 yr.
'Ivan published the book in 2011 and Artur reviewed it in 2013.'

The following examples from Czech demonstrate that the non-identity reading is also possible with arguments. Example (10a) has both the identity reading and the non-identity reading. Consider the following scenario: Marie and Jirka live in a house with a garden. Their neighbor knows that recently Marie bought a poster of Tarantino in the local bookstore and Jirka burned it because he does not like Tarantino's films. He also knows that later Marie bought a poster of Kusturica and that Jirka burned something in the garden and that this time, it was just old documents. Some time later, the neighbor saw Marie going to the bookstore and Jirka burning something in the garden again. When he asks (10a) at that moment, it can be a question about a single entity as well as about two distinct entities.

(10) a. Co Marie koupila a Jirka spálil?
what Marie bought and Jirka burned
'What did Marie buy and Jirka burn?'

b. Co Marie koupila a Jirka pak spálil?
what Marie bought and Jirka then burned
'What did Marie buy and then Jirka burn?'

c. Co Jirka spálil a Marie koupila?
what Jirka burned and Marie bought
'What did Jirka burn and Marie buy?'

In contrast, when the adverb *pak* 'then' is added to (10a), only the identity interpretation is possible, as demonstrated in (10b). The adverb brings the two events expressed by the conjuncts into a temporal

causality relation and this in turn brings about the identity of the two objects.

A comparison of (10a) and (10c) shows that the order of conjuncts – hence the order of the events – is also important. In example (10c) the non-identity reading is preferred because humans usually do not buy the ash of burnt things. With respect to the identity reading of (10c), the more prominent reading is the type (not token) identity reading. Thus, (10c) could be answered, for instance, by *Barriers*, if, during their studies, Jirka burned and Marie bought different copies of the book.
The meaning of the predicate also plays an important role. When *spálil* in (10c) is replaced with *vyrobil*, the identity reading becomes more accessible; consider example (11).[2]

(11) Co Jirka vyrobil a Marie koupila?
what Jirka made and Marie bought
'What did Jirka make and Marie buy?'

Further evidence for the existence of the non-identity reading can be found in the relative clause ATB construction in (12). If the identity reading were the only possible reading, (12) would be a contradictory statement. The sentence, however, is fully acceptable.

(12) Ta věc, kterou Marie koupila a Jirka spálil, nebyla
the thing which Marie bought and Jirka burned was.not
identická.
identical
Lit.: 'The thing that Marie bought and Jirka burned was not identical.'

Binding properties also determine the type of the reading. The topicalization ATB construction in the Russian example (13a) prefers the non-identity reading. The identity reading must be forced by an appropriate context, for instance, by: Artur has two sons, Ivan and Oleg.

[2] The fact that the type of the reading is also determined by lexico-semantic and pragmatic factors can be the source of language variation and the reason why some of the data are more permissive to the non-identity reading than their English counterparts.

When the anaphor *svoego* is replaced with a pronoun, which is not bound by the subjects, as in (13b), then the sentence receives the identity reading.

(13) a. Svoego otca Ivan ljubit i Oleg nenavidit.
self father Ivan likes and Oleg hates
'His father, Ivan likes and Oleg hates.'
b. Ego otca Ivan ljubit i Oleg nenavidit.
his father Ivan likes and Oleg hates
'His father, Ivan likes and Oleg hates.'

3 Previous Accounts

In this section, I show how the three well-known approaches to ATB constructions deal with case matching effects and the non-identity reading.

3.1 Asymmetric Approaches

In asymmetric approaches to ATB constructions, extraction takes place from only one conjunct. In such approaches, case mismatches are generally possible. In the parasitic gap approach (e.g. Munn 1992, 1993, Franks 1995, Bošković & Franks 2000), there are two different gaps that can receive case from different verbs, as demonstrated in (14) by t_1 and *pg* and their case indices standing for the assigned case.

(14) $[_{CP}\ whP_1\ [_{\&P}\ [_{TP}\ V_2\ t_{1+case2}]\ [\&\ [_{TP}\ V_3\ pg_{+case3}]]]]?$

The non-identity reading is unexpected in the parasitic gap approach because the parasitic gap is in a chain with the antecedent of the true gap (which is achieved e.g. by the operation of chain composition, as in Chomsky 1986) and members of a chain are standardly considered to be identical elements. There are two types of approaches. Either the parasitic gap forms a chain directly with the antecedent of the true gap or it forms a chain with a null operator which is linked to the chain with the true gap, as schematized below.

(15) $[_{CP}\ whP_1\ [_{\&P}\ [_{TP}\ t_1]\ [\&\ [_{TP}\ (Op_1)\ \ldots\ pg_1]]]]?$

In the ellipsis approach (e.g. Ha 2008, Salzmann 2012), gaps in particular conjuncts are not directly related and can receive different cases from the specific verbs, as demonstrated by traces t_1 and t_2 and their case indices in (16). In addition, it is known that ellipsis allows morphological mismatches, which is demonstrated in the Czech example in (17); therefore case mismatches are in fact expected.

(16) $[_{CP}\ whP_1\ [_{\&P}\ [_{TP}\ [_{vP}\ t_{1+case3}\ [V_3\ t_{1+case3}]]]\ [\&\ [_{TP}\ [_{vP}\ \sout{whP}_2\ [V_4\ t_{2+case4}]]]]]]]?$

(17) Marie měla ráda černovlasé kluky$_1$. Táně se
Marie had like black-hair guys$_{ACC}$. Tanya self
líbili blond'atí ~~kluci~~$_1$.
appealed blond$_{NOM}$ guys$_{NOM}$
'Marie liked black-hair guys. The blond ones appealed to Tanya.'

(Dotlačil 2008:(7))

The ellipsis approach also has a problem with the non-identity reading since the moved operator binds traces in all conjuncts; consider (18).

(18) $[_{CP}\ which_x\ [_{\&P}\ [_{TP}\ [_{vP}\ V_1\ [restrictor(x)]]]\ [\&\ [_{TP}\ [_{vP}\ V_2\ [restrictor(x)]]]]]]]?$

In the *pro* approach (Zhang 2009, 2010), the *pro* element, which occurs in the non-initial conjunct, can also receive a case different from the case of the filler, as schematized below.

(19) $[_{CP}\ whP_1\ [_{\&P}\ [_{TP}\ V_2\ t_{1+case2}]\ [\&\ [_{TP}\ V_3\ pro_{1+case3}]]]]?$

As to the non-identity reading, it is problematic for the *pro* approach because *pro* is bound by the filler moved from the initial conjunct, as demonstrated by the indices in (19). Examples (10)-(13) also tell against Zhang's generalization that the non-identity reading is licensed by non-thematic properties of the left-peripheral element.

With respect to case matching, the discussed approaches need some mechanism to block non-syncretic cases like (1), (3b) and (4b, c) and to ensure that the form of the filler is compatible with all appropriate cases.

Therefore, various versions of the case parallelism requirement have been proposed in the literature (see e.g. Dyła 1984, Franks 1993 and Bondaruk 2003). Concerning the non-identity reading, it poses a problem for all discussed approaches.

3.2 Approaches with a Shared Constituent

There are two types of approaches that assume that there is only one constituent, which is shared by all conjuncts and occurs in the left periphery position, the (symmetric) multidominance approach like that of Citko (2005, 2011) and the (asymmetric) sideward movement approach like that of Hornstein & Nunes (2002) and Nunes (2004). In both types, case mismatches are possible because verbs in particular conjuncts can assign different cases; consider (20) for the multidominance approach and (21) for the sideward movement approach.

(20) $[_{CP}$ whP $[_{C'}$ C $[_{\&P}$ $[_{TP}$ V_1 _$_{case1}$] [& $[_{TP}$ V_2 _$_{case2}$]]]]]?

(21) $[_{CP}$ whP $[_{\&P}$ $[_{TP}$ V_1 <whP_{+case1}>] [& $[_{TP}$ V_2 <whP_{+case2}>]]]]?

Thus, these approaches need to assume underspecification for syncretic markers and the presence of multiple cases (or multiple case values) on the shared element. In addition, Citko (2005, 2011) assumes the reversed Multiple Agree and Nunes (2004) needs to assume the lack of Activity Condition or needs to make some other adjustment of the minimalist approach.

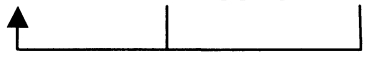
The non-identity reading is problematic for approaches with a shared constituent because in these approaches it is one and the same element that occurs in the coordinated constituents. (20) shows that in the multidominance approach, the *wh*-phrase is merged in both conjuncts and (21) demonstrates that in the sideward movement approach, the *wh*-phrase moves from the lower conjunct to the higher one.

3.3 Symmetric Approaches with a Forking Chain

In symmetric approaches with a forking chain, the same element is extracted from each conjunct or there is such an impression (see Ross

1967, Williams 1978, Blümel 2013). There is a one-to-many relation between the filler and the gaps, as schematized below.

(22) $[_{CP}$ whP $[_{\&P}$ $[_{TP}$ V_1 $t_{+case1}]$ [& $[_{TP}$ V_2 $t_{+case2}]]]]$?



Case mismatches are possible in these approaches since nothing blocks the independent gaps from receiving case from different verbs, as demonstrated in (22). The case matching requirement then must be stipulated, for instance, as a condition on the movement chain (Blümel 2013:140).

In approaches with a forking chain, copies from particular conjuncts form one chain; consider 'chain identification' in Blümel (2013:130). Therefore, the non-identity reading is also problematic for this type of approaches.

An interesting analysis of the non-identity reading can be found in Munn (1999). It is based on Chierchia's (1993) functional reading of *wh*-elements. For instance, sentence (23a) has the LF shown in (23b), in which the superscript of the trace denotes the argument of the function, which receives an interpretation under c-command by an appropriate binder (Bill for the first trace and Fred for the second one).

(23) a. Which man did Bill kill on Tuesday and Fred kill on Wednesday?
b. [Which man]$_1$ did $Bill_x$ kill t_1^x on Tuesday and $Fred_y$ kill t_1^y on Wednesday?

Although this proposal can derive the pair-list reading for *wh*-questions, it does not derive other ATB constructions, like ATB topicalizations.

To summarize, all three discussed approaches can derive ATB constructions with case syncretism; however, additional assumptions are always necessary. The non-identity reading poses a problem for all discussed approaches; only Munn (1999) can partially derive it.

4 The Analysis

4.1 The Non-Identity Reading

I propose to derive the non-identity reading by two (or more) independent movement chains; see (24a) for *wh*-movement. The non-identity reading is a result of the presence of two distinct operators binding their corresponding variables, as shown in (24b).

(24) a. $[_{CP}\ whP_1\ whP_2\ [_{\&P}\ [_{TP}\ t_1]\ [\&\ [_{TP}\ t_2]]]]$
b. For which x, P(x) and for which y, Q(y)?

This analysis is supported by the fact that Slavic has overt multiple *wh*-fronting, as demonstrated by the following example from Russian.

(25) Kto_1 $kogo_2$ t_1 chočet t_2?
who whom wants
'Who wants whom?

Since sentence mood cannot differ in ATB constructions, see example (26), but tenses of the conjuncts can, see (27), TPs—not CPs—are conjoined.

(26) a. Co jsem četl?
what am read
'What did I read?'
b. Čti (to)!
'Read (it)! '
c. * Co jsem četl a čti
what am read and read (Czech)

(27) Kolik lidí vaše univerzita vyhodila a jejich
how.many people your university fired and their
univerzita přijme?
university hires
'How many people did your university fire and will their
university hire?' (Czech)

4.2 Haplology Reduction

Since the moved elements are syncretic in cases like (28a) (reproduced from (2)), haplology reduction applies. This reduction must apply, as shown by the ungrammatical example (28b) (cf. Billings & Rudin 1996 and Bošković 2002 for a PF constraint against consecutive homophonous *wh*Ps in non-coordinate structures).

(28) a. Kogo ~~kogo~~ Janek lubi a Jerzy nienawidzi?
who who Janek likes and Jerzy hates
'Who does Janek like and Jerzy hate?'
b.* Kogo kogo Janek lubi a Jerzy nienawidzi?
who who Janek likes and Jerzy hates

The deleted constituent is recovered from the parallel element. This is not possible in non-coordinate structures since there is not a parallel element; hence sentences like the Russian (29a) are ungrammatical. Such structures, however, can be repaired by the spell-out of the lower copy, as demonstrated by example (29b).

(29) a.* Čto ~~čto~~ pričinilo?
what what caused
b. Čto pričinilo čto?
what caused what
'What caused what?'

What is nature of the haplology reduction? It cannot be ellipsis (at least not the type of ellipsis like in (17), which allows mismatches) because it does not allow mismatches. It must be a PF process but it cannot be 'pure' haplology since it can also delete a complex constituent, as in (30) (reproduced from (6a)) (cf. haplological processes in Richards's (2010) analysis of multiple *wh*-fronting).

(30) Jak rychle ~~jak rychle~~ Marie běhá a Jirka
how fast how fast Marie runs and Jirka
plave?
swims
'How fast does Marie run and Jirka swim?'

The reduction does not apply if it would induce ungrammaticality, as in the example (29) above. For this reason, the German example (31a) is not haplologized as (31b).

(31) a. Es sind die, die die Bücher gelesen haben.
it are the who the books read have
'It is the people that read the books.'
b.* Es sind die Bücher gelesen haben.
it are the/who books read have
c. Es sind die, die Bücher gelesen haben.
it are the who books read have
'It is the people that read books.'

Haplology reduction also does not change the meaning of the sentence, as shown in the Czech example in (32). Therefore, (31a) cannot be haplologized as (31c).

(32) Pokusil se ~~se~~ nemýt celý týden.
he.tried self self not.wash whole week
'He tried not to wash himself for the whole week.'

For the same reason, the Russian sentence (33a) cannot be haplologized as (33b).

(33) a. On videl čeloveka s binoklem binoklem.
he saw man with binoculars binoculars
'He saw a man with binoculars with binoculars.'
b. On videl čeloveka s binoklem.
he saw man with binoculars
'He saw a man with binoculars.'

Thus, the generalization is that haplology reduction should not induce ungrammaticality or change the interpretation of the sentence. A closer look at the problematic reductions reveals that they are bad because they cannot be recovered. This means that they can be excluded by the principle of recoverability, which is independently necessary. In this respect, I follow Chomsky (1965:177, 222), who proposes that only recoverable deletions are permitted in the grammar. This in turn leads to

the conclusion that haplology reduction of the consecutive identical string is grammatical if it does not produce an expression with an unrecoverable element.

4.3 Movement

That movement indeed takes place from both conjuncts is shown by example (34) (reproduced from (13a)) with the non-identity reading, in which *svoego otca* reconstructs into both conjuncts.

(34) Svoego otca Ivan ljubit i Oleg nenavidit.
self father Ivan likes and Oleg hates
'His father, Ivan likes and Oleg hates.'

This is also supported by island data like (35), where the derivation is ungrammatical regardless of whether the relative clause with the gap occurs in the first conjunct, as in (35d), or in the second conjunct, as in example (35c).

(35) a. Co Janek ugotował t i Maria kupiła t?
what Janek cooked and Maria bought
'What did Janek cook and Maria buy?'

b. Janek coś ugotował i Maria znalazła
Janek something cooked and Maria found
chłopca, który to kupi.
boy who it buys
'Janek cooked something and Maria found a boy who will buy it.'

c.* Co Janek ugotował t i Maria znalazła chłopca, który
what Janek cooked and Maria found boy who
kupi t?
buys

d.* Co Janek znalazł chłopca, który kupi t, i Maria
what Janek found boy who buys and Maria
ugotowała t?
cooked (Polish)

In coordinate constructions like (34), the extractions violate the Coordinate Structure Constraint; see Ross (1967:89). However, Ross also shows that violation of the Coordinate Structure Constraint is possible if

the movement happens in the ATB fashion, that is, if it affects all conjuncts. In the current approach, the extraction indeed takes place from all conjuncts; however, in contrast to approaches like Williams (1977), there is no construction specific mechanism. Here, ATB movement is, in fact, multiple movement with haplology reduction.

Given the fact that in multiple *wh*-fronting one of the elements can stay *in situ* under certain circumstances, as in (29b), one must ask what happens in coordinate constructions in such a case. Such coordinate constructions are excluded by the Coordinate Structure Constraint, independently of whether or not the element *in situ* is homophonous with the moved phrase; consider the example below, a slightly modified version of the grammatical example (4a).

(36) * $\text{Koho}_{\text{ACC/GEN}}$ se naše univerzita zbavila t_{GEN} a vaše
who self our university fired and your
univerzita přijala $\text{koho}_{\text{ACC/GEN}}$ / co_{ACC}?
university hired/accepted who what

A reviewer proposes to analyze ATB-moved elements as individual concepts that map situations to individuals. This would mean that in contrast to my proposal, there is only one moved element in the left periphery, which refers to different entities because particular conjuncts can predicate over distinct situations. Such an analysis, however, would have a problem with pairs of predicates which describe one and the same situation, like *win* and *lose*, yet allow the non-identity reading. Consider the ATB question in (37a).

(37) a. S kým Jirka vyhrál a Pavel prohrál?
with who Jirka won and Pavel lost
'Against who did Jirka win and Pavel lose?'

b. Jirka vyhrál s Pavlem a Pavel prohrál s Jirkou.
Jirka won with Pavel and Pavel lost with Jirka
'Jirka won against Pavel and Pavel lost against Jirka.'

The answer in (37b) shows that the non-identity reading is possible. When Pavel and Jirka only played one match till the time of the dialogue, for instance, in some tennis tournament in their village, we also receive the one situation scenario. In contrast, ATB examples like (37a) are not

problematic for my analysis because the non-identity reading is derived by two independent movements regardless of whether or not the coordinated conjuncts predicate over the same situation.

4.4 Morphological Case Parallelism

At this point, the question arises what blocks non-syncretic derivations like (38)=(1).

(38) * $Co_{NOM/ACC}$ Janek lubi t_{ACC} a Jerzy nienawidzi t_{GEN}?
what Janek likes and Jerzy hates

In this respect, I assume in accordance with the literature that there is a morphological case parallelism. Consider the formulation in (39).

(39) *Morphological case parallelism*
Elements parallelly moved out of a coordinate structure have the same morphological case.

Such a parallelism is assumed by asymmetric approaches (see e.g. Franks 1993, 1995 and Bondaruk 2003) as well as by symmetric approaches with a forking chain (see conditions on the movement chain in Blümel 2013). Approaches with a shared constituent do not need to assume such a parallelism because in their analyses, all conjuncts share one and the same element. However, they make other assumptions instead, as discussed in section 3.2.

The Morphological case parallelism checks at the level of PF whether the moved elements have the same morphological case, that is, whether they are syncretic. The phrase 'parallelly moved' in (39) identifies elements that move from distinct conjuncts and meet the usual requirements on movement from coordinate structures (see also below). The Morphological case parallelism filters out derivations with non-syncretic cases independently of whether or not the second element is overt; compare example (38), without *czego*, with the following example.[3]

[3] Alternatively, (38) could be excluded because of inappropriately used haplology reduction.

(40) * $\text{Co}_{\text{NOM/ACC}}$ $\text{czego}_{\text{GEN}}$ Janek lubi t_{ACC} a Jerzy
what what Janek likes and Jerzy
nienawidzi t_{GEN}?
hates

It has been argued that there are also other types of parallelism requirements on movement from coordinate structures (see Dyła 1984, Franks 1993, 1995 and Bondaruk 2003 on the abstract case requirement and the notion of relative prominence; Lechner 2001 and Kasai 2004 on structural parallelism requirements and Citko 2006 on the distinctness requirement on remnants in ATB constructions).

According to Ross (1967), ATB rules affect the same element. In the same vein, Williams (1978) argues that *wh*-words (simultaneous factors) moved from a coordinate structure must be identical. Similarly, Blümel (2013) proposes that ATB-moved elements must be featurally identical. Such an identity requirement excludes, for instance, cases like the Polish (41), where two distinct lexical elements are moved.[4]

(41) * Kogo_{ACC} $\text{czego}_{\text{GEN}}$ Janek lubi t_{ACC} a Jerzy
who what Janek likes and Jerzy
nienawidzi t_{GEN}?
hates

4.5 The Identity Reading

The identity reading can be obtained via coindexation (or chain composition; see e.g. Chomsky 1986, Franks 1995 and Culicover 2001), as schematized below.

(42) $[_{\text{CP}}\ \text{XP}_1\ \text{YP}_1\ [_{\&\text{P}}\ [_{\text{TP}}\ t_1]\ [\&\ [_{\text{TP}}\ t_1]]]]$

With respect to referential expressions – for instance, in topicalization ATB constructions – there are two options here, binding and coreference (covaluation). Binding happens at the level of LF and is based on coindexing and c-command. In addition, we know that the conditions on binding are absolute output conditions. In contrast, coreference

[4] Note, however, that it cannot be total feature identity because different abstract cases are possible in ATB constructions, as we saw above.

(covaluation) means referring to the same entity and no c-command is necessary. This process takes place at the conceptual structure or at the syntax, semantics and pragmatics interface. Contrary to conditions on binding, conditions on coreference (covaluation) are relative and context dependent (Reinhart 1983, 2011, Reuland 2001).

Now, recall from the discussion in Section 2 that the type of the reading depends not only on the meaning of other elements in the clause, as in (10b) and (11), or on the ordering of events, as in (10a,c), but also on the extra-clausal context, as in (13), and on our world knowledge, as in examples (6) and (10). This means that coreference (covaluation) is the preferable option.

In the case of non-referring expressions – like in question ATB constructions – there are two basic possibilities. First, we could follow one of the approaches that successfully derive the identity reading, as discussed in section 3.

Second, if we want to pursue the analysis with two/more independent movement chains, then the chains should not be interpreted independently. In this respect, we could use, for instance, Chomsky's (1986) mechanism of chain composition or Wilder's (1994) ellipsis chain approach.

5 Conclusions

I have argued that ATB constructions involve independent movements and haplology reduction. As a consequence, there is no construction specific mechanism, that is, forking chains. ATB movement as such does not exist; it is a by-product of haplology reduction. In contrast to other approaches, the proposed analysis derives both case syncretism and the non-identity reading.

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On Extraction out of Inherently Case-Marked Elements*

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1 Extraction out of Inherently Case-marked and Moved Elements

The goal of this paper is to provide an account of an ill-understood locality effect concerning inherent case, namely, the fact that extraction out of inherently Case-marked elements is disallowed, as shown by (1).[1]

(1) ?*Kojeg doktora$_i$ si prijetio [prijatelju t_i]?
which doctor$_{GEN}$ be$_{2SG}$ threatened friend$_{DAT}$
'Which doctor did you threaten a friend of?' (Serbo-Croatian)

It will be shown that inherently Case-marked elements exhibit the same kind of locality with respect to extraction as moved elements, which will be shown to have important consequences for inherent Case-licensing.

Many have argued that extraction out of moved elements is banned. Bošković (in press) shows that this ban can be deduced in a way that allows such extraction in one well-defined context, where such extraction is indeed allowed. As noted above, inherently Case-marked elements are islands—they disallow extraction. Importantly, we will see that the context that exceptionally allows extraction out of moved elements also exceptionally allows extraction out of inherently Case-marked elements.

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[1] The effect was noted in Starke (2001), though only for one context (see section 3).

Inherently Case-marked elements thus show the same kind of locality as moved elements. Based on that, it will be argued that the islandhood of inherently Case-marked elements should be unified with the islandhood of moved elements, which in turn indicates that inherently Case-marked elements undergo movement, the main conclusion of this paper. The reason for this movement will also be discussed.

I will start the discussion with the ban on movement out of moved elements, returning to inherently Case-marked elements in section 3.

2 On the Ban on Movement out of Moved Elements

Many authors have argued that movement out of moved elements is disallowed (see Wexler and Culicover 1980, Diesing 1992, Takahashi 1994, Müller 1998, Stepanov 2001, Boeckx 2008, among many others).

(2) Movement is not possible out of moved elements.

The Subject Condition, which bans extraction out of subjects in SpecTP, illustrates (2). Under the VP Internal Subject Hypothesis, subjects move to SpecTP. Extraction out of a subject in SpecTP, as in (3), then involves extraction out of a moved element, i.e. it is an instance of (2).

(3) ?*I wonder $[_{CP}$ who$_i$ $[_{DP}$ friends of $t_i]_j$ $[_{vP}$ t_j hired Mary]].

That subject movement is indeed the culprit here is confirmed by the fact that extraction is possible from subjects that remain in SpecvP (see for example Takahashi 1994, Stepanov 2001), as illustrated by Spanish (4), taken from Gallego and Uriagereka (2007), which contrasts with (5).

(4) ¿De qué equipo$_i$ dices que han bailado$_j$ $[_{vP}$ [dos
of what team say$_{2SG}$ that have$_{3PL}$ danced two
participantes t_i] t_j]?
participants
'Which team do you say that two members of have danced?'

(5) ?*¿De qué equipo$_i$ dices que $[_{DP}$ dos participantes $t_i]_j$ han bailado t_j?

Extraction out of moved objects is also disallowed. Thus, Lasnik (2001) argues that the object in pseudogapping undergoes object shift, which is followed by VP ellipsis. Crucially, extraction from such objects is degraded, as in (6). Particle constructions where the object precedes the particle also involve object shift (see Lasnik 2001, Johnson 1991). Again, extraction out of such objects is degraded, as in (7).

(6) ?*Who will Bill select a painting of, and who$_j$ will Susan [a photograph of t_j]$_i$ ~~[$_{VP}$ select t_i]~~?

(7) ?*Who$_j$ did you call [friends of t_j]$_i$ up t_i?

Torrego (1998) argues *a*-marked objects in Spanish undergo movement. Importantly, they disallow extraction (see also Diesing 1992 and Müller 1998 on movement out of scrambled/shifted objects in German).

(8) ?*[De quién]$_j$ has visitado [$_{DP}$ a muchos amigos t_j]$_i$ [$_{VP}$ ... t_i]?
of whom have$_{2SG}$ visited A many friends
'Who have you visited many friends of?'
(Gallego & Uriagereka 2007)

(2) also holds for A'-moved (9) and rightward-moved (10) elements.[2]

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[2] (9b) involves movement from a vP that is remnant-fronted to SpecCP (with *hat* moving to C). Torrego (1985) claimed that Spanish allows extraction from SpecCP based on examples like (i). However, Gallego (2007) shows that such cases involve a prothetic object, where the extracted element is the object of the higher verb (see (ii)). When this possibility is blocked by reconstruction, as in (iii), the example becomes unacceptable.

(i) Este es la autor del que no sabemos qué libros leer.
this is the author by whom not (we) know what books read

(ii) Este es la autor [del que]$_i$ no sabemos t_i [$_{CP}$ [qué libros]$_j$ leer t_j].

(iii) *[$_{CP}$[De qué hijo suyo$_j$]$_i$ C sabes [$_{CP}$[qué novelas t_i] C ha leído todo padre$_j$]]?
of what son his know$_{2SG}$ what novels have$_{3SG}$ read every father
'Which son of his do you know which novels by has every father read?'

(9) a. ?*Whose books$_i$ do you think that [reviews of t_i]$_j$ he never reads t_j?
b. *Was$_i$ denkst du [$_{CP}$ [$_{vP}$ t_i gelesen]$_j$ hat$_k$ [$_{IP}$ keiner t_k t_j]]?
what think you read has no.one
'What do you think no one reads?' (Corver in press)

(10) ?*What$_i$ did you see t_j yesterday [a movie about t_i]$_j$?

P-stranding is also not possible with PPs that undergo movement.

(11) *Which table$_i$ did you think that [on t_i]$_j$ John put the book t_j?

There is thus a great deal of evidence for (2).[3] Bošković (in press) shows that (2) follows from independently made assumptions regarding phases and labeling. The former concerns Chomsky's (2000, 2001) criteria for differentiating phases and non-phases, namely (12) (see Chomsky 2000, 2001, Rackowski and Richards 2005, Matushansky 2005, Harwood 2013, Legate 2014, Bošković 2015a, among others).

(12) Only phases can undergo movement.

Bošković (in press) shows (2) follows from (12) and Chomsky's (2013) labeling theory, which allows unlabeled objects during the derivation but not in final representations. In Chomsky (2013), when a head and a phrase merge the head projects, providing the label for the resulting object. When two phrases merge there are two ways to label, through prominent feature sharing or traces, traces being ignored for labeling. (13) illustrates the former with the merger of *which book* and wh-C (actually CP at the relevant derivational point). Both the wh-phrase and the CP have the Q-feature—what is projected (i.e. determines the label of the resulting object through prominent feature-sharing) is the Q-feature.[4]

(13) I wonder [$_{CP}$ which book$_i$ [$_{C'}$ C [John bought t_i]]].

Consider now (14), with the relevant derivational point in (15).

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[3] There have been claims that (2) does not hold, for relevant discussion see Bošković (in press) and footnotes 2 and 5 here. Note, however, that under Bošković's (in press) account of (2), movement is actually not always disallowed out of moved elements, as discussed below.

[4] I will continue using CP and SpecCP for such cases for ease of exposition.

(14) What$_i$ do you think [$_{CP}$ t'$_i$ [$_{C'}$ that [John bought t$_i$]]]?
(15) v [$_{VP}$ think [$_?$ what [$_{CP}$ that [John bought t$_i$]]]

Chomsky assumes successive cyclic movement does not involve feature sharing, following Bošković (1997, 2002, 2007). As there is no feature sharing between *that* and the wh-phrase passing through its edge, labeling via feature sharing is not an option here. The embedded clause then cannot be labeled after *what* moves to its edge. When v is inserted (15), *what* moves away. The element merged with the *that*-CP being a trace, it is ignored for labeling, hence ? is labeled as CP after *what* moves away. Only at this point is the embedded clause in (14) labeled.

This is the general treatment of successive cyclic movement in the labeling framework. With this in mind, consider (16). (16a) involves movement of YP from moved XP. Before the movements, we have (16b).

(16) a. YP$_i$ [$_{XP}$ ... t$_i$ ...]$_j$ ... t$_j$
b. [$_{XP}$ ... YP ...]

Since only phases can move, for XP to move it must be a phase. Given the PIC, which requires movement out of a phase to proceed via its edge, YP must move to the edge of XP before moving out of XP. Furthermore, movement of YP to the edge of XP must precede the movement of XP, given the cycle. As discussed above, the merger of YP and XP yields an unlabeled object. Now, for Chomsky, phases are CPs, vPs, and DPs (see Bošković 2013a, 2014 on APs and PPs). However, the result of the merger of YP and XP is none of these; the object formed by this merger does not have a label at all, hence it is not a phase (in other words, phases require label-determination, hence unlabeled objects cannot be phases).

For illustration, consider the Subject Condition case in (17). Subjects being phases, *who* must move to the edge of the subject. Given the cycle, this must happen before the subject moves out of vP. A merger of *who* and the subject DP yields an unlabeled object, which, not having a label, is not a phase. The object marked with ? in (17b) then cannot move.[5]

[5] Under Saito's (2016) analysis of labeling in Japanese, this account predicts scrambling from scrambled elements in Japanese to be possible, which it is (see Bošković in press; see also that work for other derivations of (17), which are not discussed here).

(17) a. *I wonder who$_i$ [friends of t$_i$] left.
b. [$_{TP}$ T [$_{vP}$ [$_?$ who [$_{DP}$ subject]]]]

Note the account still allows remnant movement, where YP moves from XP *before* XP moves. Consider vP fronting. The result of the merger of the subject and vP in (18) cannot be labeled (see Chomsky 2013), as in (19a). *She* moves to SpecTP; its trace being ignored for labeling, the relevant element is labeled as vP (19b). Since vP is a phase it can move.

(18) [$_{vP}$ t$_i$ kiss Mary]$_j$ [$_{TP}$ she$_i$ did t$_j$]
(19) a. [$_?$ she [$_{vP}$ kiss Mary]]
b. [$_{TP}$ she$_i$ [$_{vP}$ t$_i$ kiss Mary]]

The above account provides a new perspective on (2), where the problem with movement of YP out of moved XP does not arise when YP moves out of XP; it arises already with movement of XP. XP itself cannot move here, hence any later movement out of XP is trivially blocked. It is then not the case that movement of XP freezes its internal structure; rather, movement of YP to the edge of XP prevents movement of XP.

All the cases from Section 2 involve successive-cyclic movement via the XP edge. Since by the very nature of successive-cyclic movement the phrase undergoing it cannot stay in an intermediate Spec for independent reasons, all the cases involve movement from a moved element, which led to the 'illusion' that this later movement caused their unacceptability.

When YP undergoes successive-cyclic movement via the edge of XP, labeling of the YP-XP merger is not possible due to the lack of feature sharing; YP must move to enable labeling. This would not be the case if YP is base-generated at the edge of XP, undergoing feature sharing: while with successive-cyclic movement (the non-feature sharing case), labeling must be delayed (it is not possible until one element moves), with feature-sharing merger, labeling is possible at the creation of the relevant structure. We then predict that (2) should not hold when the phrase that undergoes extraction from a moved element is base-generated at its edge and can otherwise stay there, an indication that it undergoes feature-sharing with the element that it merges with. Movement out of a

moved element should then be allowed—no labeling problem would arise since all labeling would take place *before* the relevant movements.[6]

Bošković (in press) gives a number of cases that show that movement from a moved element is indeed allowed in this configuration. One such case involves Serbo-Croatian (SC) possessors, which Bošković (2013a) argues are base-generated at the phasal edge. One argument for this is given in Despić (2011, 2013), based on the binding violations in (20c,d), which indicate that the possessor c-commands out of its Traditional NP (TNP).[7] It must then be located at its edge, which means that it is located at the phasal edge given that the highest phrase in the extended domain of N is a phase, as argued in Bošković (2013a, 2014).

(20) a. His$_i$ latest movie really disappointed Kusturica$_i$.
b. Kusturica$_i$'s latest movie really disappointed him$_i$.
c. *[$_{NP}$ Kusturicin$_i$ [$_{NP}$ najnoviji film]] ga$_i$ je zaista
Kusturica's latest movie him be$_{3SG}$ really
razočarao.
disappointed
'Kusturica's latest movie really disappointed him.'
d. *[$_{NP}$ Njegov$_i$ [$_{NP}$ najnoviji film]] je zaista razočarao
his latest movie be$_{3SG}$ really disappointed
Kusturicu$_i$.
Kusturica

[6] Bošković (in press) assumes that labeling can take place as soon as it is possible (see Bošković 2015a, Rizzi 2016, Saito 2016, Shlonsky 2014), which means that under feature-sharing, labeling can occur before any movement of the elements that undergo feature-sharing. Notice that Chomsky (2013) assumes that labeling takes place at the phasal level, for the whole phase. Nothing changes regarding the prediction from the text under this approach: a label for the result of a merger of a base-generated edge of phase XP that undergoes feature sharing is determined at the phasal level of XP, hence before movement of XP.

[7] The term TNP is used neutrally, for whatever the category of the relevant element is (which is not crucial here). Bošković (2013a, 2014) and Despić (2011, 2013) actually argue that the SC possessor is TNP-adjoined, under the standard assumption that XP adjoined to YP c-commands everything that YP does. (They also argue that the DP layer is missing in SC, a language without articles.)

SC possessors undergo agreement in φ-features and Case (i.e. they undergo feature-sharing). They can also move. Crucially, they can move out of moved elements. In (21a), the possessor is extracted out of a fronted object, and in (21b) out of a moved passive subject. In (21c), the adverb indicates subject movement to SpecIP before poss-extraction.

(21) a. Jovanovu$_i$ je on [$_{NP}$ t$_i$ sliku]$_j$ vidio t$_j$.
John's$_{ACC}$ be$_{3SG}$ he picture$_{ACC}$ seen
'He saw John's picture.'
b. Jovanova$_i$ je [$_{NP}$ t$_i$ slika]$_j$ ukradena t$_j$.
John's$_{NOM}$ be$_{3SG}$ picture$_{NOM}$ stolen
'John's picture was stolen.'
c. Jovanov$_i$ je [$_{NP}$ t$_i$ prijatelj] vjerovatno otpustio Mariju.
John's$_{NOM}$ be$_{3SG}$ friend$_{NOM}$ probably fired Maria$_{ACC}$
'John's friend probably fired Maria.'

(21) shows that (2) does not hold for elements that are base-generated at the edge of the relevant phrase. Consider the derivation of (21a): Poss is generated at the TNP-edge. It undergoes feature-sharing, hence the TNP is labeled (22a). The TNP is a phase (Bošković 2013a, 2014), hence it can move (22b). After the object moves, the possessor is extracted (22c).

(22) a. vidio [$_{NP}$ Jovanovu sliku]
seen John's$_{ACC}$ picture$_{ACC}$
b. [$_{NP}$ Jovanovu sliku]$_j$ vidio t$_j$
c. Jovanovu$_i$ je [$_{NP}$ t$_i$ sliku]$_j$ vidio t$_j$

(21a) shows extraction out of moved elements is possible exactly where it is predicted to be possible under Bošković's (in press) account of (2).

The account of (21) extends to (23a,b), which also involve movement of a base-generated edge of XP after XP moves (see Bošković in press).

(23) a. Skup$_i$ su oni [t$_i$ automobil]$_j$ kupili t$_j$.
expensive be$_{3PL}$ they car bought
'They bought an expensive car.'
b. ?Izuzetno$_i$ su [t$_i$ skup]$_j$ kupili [t$_j$ automobil].
extremely be$_{3PL}$ expensive bought car
'They bought an extremely expensive car.'

Further, observing that there is crosslinguistic variation with respect to extraction of adjuncts out of TNPs, Bošković (2013a) argues that in languages where adjuncts can extract out of TNPs, like SC, such adjuncts are base-generated adjoined to the TNP. As expected then, they can also extract from moved TNPs. (This case was not noted in Bošković in press.)

(24) O kojoj zemlji$_i$ je on [knjigu t_i]$_j$ kupio t_j?
about which country be$_{3SG}$ he bought book

Another case concerns German PPs and *r*-pronouns. They exceptionally precede adpositions (25a), which are otherwise always prepositional.

(25) a. davon/*von da
it.of
b. von dem Mann/*dem Mann von
of the man
(26) Er hat davon$_i$ noch nicht [das Vorwort t_i] gelesen.
he has it-of yet not the foreword read

Davon is standardly analyzed as involving movement of *da* to SpecPP (or a higher position in the P's extended projection; I will use the former for ease of exposition). Note that the DP P order is restricted to the small group of *r*-pronouns and about 20 prepositions, indicating that agreement/feature-sharing is involved here (only elements that undergo it occur in this configuration), which makes labeling possible. That *da* must move to SpecPP (25a) and stays in SpecPP (26) shows that movement of *da* to SpecPP does not occur for reasons of successive-cyclicity.

Da can also strand the P (27). It is also possible to first move the PP and then move *da*, as in (28). (*[das Vorwort t_j]* undergoes remnant movement.) Dutch (29), which does not involve remnant movement, illustrates the same point (*waar* is an *r*-pronoun, which must precede the P within the PP).

(27) Er hat da$_i$ noch nicht [das Vorwort [t_i von t_i]] gelesen.
he has it yet not the foreword of read
(28) Er hat da$_i$ [das Vorwort t_j]$_k$ noch nicht [t_i von t_i]$_j$ t_k gelesen.
he has it the foreword yet not of read
(den Besten and Webelhuth 1990)

(29) Waar$_i$ had jij dan [t_i *mee* t_i]$_j$ gedacht [dat je de vis t_j
where had you then with thought that you the fish
zou moeten snijden]?
would must cut
'What did you think you should cut the fish with?'
(Barbiers 2002)

The account of (21) extends to (28)-(29), which involve movement to a feature-sharing position: *da/waar* move to SpecPP, the PP then moves, and *da/waar* move out of the PP. Since *da/waar* undergo feature-sharing needed for labeling in SpecPP, no labeling problem arises here.[8]

All this indicates that nothing is in principle wrong with movement out of moved elements: what is wrong in the cases used to motivate (2) is that the element that is later moved out of cannot move itself. A phase with a feature-sharing edge can move, but a phase with a non-feature sharing edge (as is the case with successive cyclic movement) cannot. (2) is then misguided. The right generalization is (30), which is a theorem.[9]

(30) Phases that host successive-cyclic movement cannot move.

Given the above background, I return to inherently Case-marked NPs.

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[8] A referee notes example (i), which is somewhat degraded but not fully unacceptable. *Naše porodice* is focalized here; it is then possible that (i) involves focus movement to a TNP-internal FocP (which freezes *naše porodice* in this position, preventing its further movement due to the criterial freezing effect), with *naše porodice* undergoing feature-sharing within FocP, making labeling, and movement, possible here.

(i) ?(?)Naše porodice sliku sam okačio na zid.
our family picture be$_{1SG}$ hanged on wall
'I hanged the picture of our family on the wall.'

[9] (30) can be restated as (i), or as (ii) within the labeling framework (for relevant discussion, see Bošković in press).

(i) Phases with non-agreeing Specifiers cannot undergo movement.

(ii) Unlabeled elements cannot undergo movement.

3 Islandhood of Inherently Case-Marked NPs

Starke (2001:39) observes with respect to extraction of adnominal complements in Czech that extraction from inherently Case-marked TNPs is worse than extraction from structurally Case-marked ones. The point is illustrated in (31) with respect to SC. While extraction of genitive complements of nouns is in general somewhat degraded in SC, (31a), which involves extraction out of a dative object, is clearly worse than (31b), which involves extraction out of an accusative object.[10,11]

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[10] The contrast is also found with the extraction of inherently Case-marked nominal complements; it is even clearer in this case since their extraction is better than extraction of genitive nominal complements (see Bošković 2013a; I discuss the former in work in preparation, focusing on inherently Case-marked complements of verbs here).

(i) a. ?*Kakvim štrajkom$_i$ se hvalio [prijetnjama t_i]?
what.kind.of strike$_{INSTR}$ self boast threats$_{INST}$
'What kind of a strike did he boast with threats of?'

b. Kakvim štrajkom$_i$ si podržavao [prijetnje t_i]?
what.kind.of strike$_{INSTR}$ be$_{2SG}$ supported threats$_{ACC}$
'What kind of a strike did you support threats of?'

[11] Starke notes the effect in question is found in Czech and Slovak, as well as German and Greek. Spanish may exhibit the same behavior, the relevant case involving extraction out of dative *a*-objects (8). The discussion below can apply to this case too; it can in fact provide motivation for Torrego's (1998) movement of *a*-marked DPs.

The islandhood of nominal complements of ergative verbs, noted in Bošković (2015a) and illustrated by (i), may also be relevant here.

(i) ?*Who$_i$ did John's embarrassment escape [friends of t_i]? (Bošković 2015a)

Under Burzio's generalization, ergative verbs should not be able to license structural accusative. The object in (i) should then bear inherent Case. (i) could then be taken as another illustration of the islandhood of inherently Case-marked NPs. However, as noted in Bošković (2015a), even clausal complements of ergative verbs generally display islandhood. If the general locality effect found with ergative verbs and discussed in Bošković (2015a) is to be attributed to the islandhood of inherent Case we would need to assume that even the CP in (ii) bears inherent Case; see, however, Bošković (2015a) for an alternative, unified account of (i-ii) which is independent of Case considerations).

(ii) ?*What$_i$ did it appeal to Mary/depress Mary [that John fixed t_i]?

(31) a. ?*Kojeg doktora$_i$ si prijetio [prijatelju t_i]?
which doctor$_{GEN}$ be$_{2SG}$ threatened friend$_{DAT}$
'Which doctor did you threaten a friend of?'
b. ?(?)Kojeg doktora$_i$ si vidio [prijatelja t_i]?
which doctor$_{GEN}$ be$_{2SG}$ seen friend$_{ACC}$
'Which doctor did you see a friend of?'

This indicates that inherently Case-marked TNPs are islands. Bošković (2015b) suggests capturing the islandhood of inherently Case-marked TNPs by treating them as adjuncts: they then involve extraction from an adjunct. However, if inherently Case-marked TNPs were adjuncts we would expect extraction of such TNPs from islands to yield ECP-strength violations. This is not borne out. Thus, (34) patterns with (33) rather than (32), involving extraction of a nominal adjunct, regarding the strength of the violation, which argues against the adjunct analysis (all the examples are acceptable without extraction, e.g. *Pitaš se kad je trčao šumom*).

(32) *Šumom$_i$ se pitaš [kad je trčao t_i].
forest$_{INSTR}$ REFLwonder$_{2SG}$ when be$_{3SG}$ run
'You wonder when he ran through a/the forest.'
(33) ??Šumu$_i$ se pitaš [kad je posjekao t_i].
forest$_{ACC}$ REFL wonder$_{2SG}$ when be$_{3SG}$ cut-down
'You wonder when he cut down a/the forest.'
(34) ??Fabrikom$_i$ se pitaš [kad je rukovodio t_i].
factory$_{INSTR}$ REFL wonder$_{2SG}$ when be$_{3SG}$ managed
'You wonder when he managed a/the factory.'

Importantly, movement out of inherently Case-marked TNPs is not always blocked. In particular, elements base-generated at their edge can move. Thus, extraction of possessors of inherently Case-marked TNPs is possible (35). The same holds for extraction of adjectives (36).

(35) Čijem$_i$ si prijetio [t_i prijatelju]?
whose$_{DAT}$ be$_{2SG}$ threatened friend$_{DAT}$
'Whose friend did you threaten?'

(36) Lojalnom$_i$ si prijetio [t_i prijatelju]?
loyal$_{DAT}$ be$_{2SG}$ threatened friend$_{DAT}$
'You threatened a loyal friend.'

Inherently Case-marked TNPs then show the same kind of islandhood as moved elements: they allow extraction for elements base-generated at their edge. The parallelism can be captured if inherently Case-marked TNPs must undergo movement.[12] Extraction from inherently Case-marked TNPs can then be treated in the same way as extraction from moved elements: the above account of extraction out of moved elements in fact then extends to extraction out of inherently Case-marked elements.

The account can also be extended to the following contrast involving subextraction from APs. Given that inherently Case-marked elements must undergo movement, extraction of the adjectival complement in (38) involves extraction out of a moved element (i.e. the object TNP).

(37) ?Generalu_i sam vidio [[$_{AP}$ lojalnog t_i] vojnika].
general$_{DAT}$ be$_{1SG}$ seen loyal$_{ACC}$ soldier$_{ACC}$
'I saw a soldier loyal to the general.'

(38) *Generalu_i sam komandovao [[$_{AP}$ lojalnim t_i] vojnikom].
general$_{DAT}$ be$_{1SG}$ commanded loyal$_{INST}$ soldier$_{INST}$
'I commanded a soldier loyal to the general.'

Interestingly, subextraction from APs modifying inherently Case-marked Ns is possible for elements base-generated at the edge of the adjective.

(39) ?Izuzetno$_i$ sam komandovao [[$_{AP}$ t_i [$_{AP}$ lojalnim]] vojnikom].
extremely be$_{1SG}$ commanded loyal$_{INST}$ soldier$_{INST}$
'I commanded an extremely loyal soldier.'

From the current perspective, these data indicate that while the intensifier in (39) counts as being located at the edge of the object TNP, and hence need not move to its edge when undergoing successive-cyclic movement, the adjectival complement in (38) is not located at the edge of the object in its base position, hence must undergo successive-cyclic movement via its edge. Only (38) then involves successive-cyclic movement via the object TNP edge. Since, being inherently Case-marked, this TNP also

[12] Notice that SC participles undergo movement (see Bošković 2001, Stjepanović 1998), hence a TNP that follows it may still undergo movement.

undergoes movement, only (38) is then ruled out under the current approach to (2).

This can also help us sharpen the notion of the edge of a phase. Talić (2015a) argues that the intensifier in (39) is AP-adjoined in its base position. Given that AP itself is located at the edge of the TNP phase in SC (see Bošković 2013a), *izuzetno* is then located at the edge of the edge of the TNP phase. There are conflicting positions on whether the edge of the edge of phase XP counts as the edge of XP. Though the issue is not explicitly discussed there, under Chomsky's (2000) approach to the PIC this is the case. On the other hand, Hiraiwa (2005) argues that the edge of the edge of phase XP should not count as the edge of XP. The above data show that both positions are sort of right and wrong (i.e. neither is fully right or wrong); these data show that what is *dominated* by the edge of phase XP[13] is not at the edge of XP. Since *extremely* is not dominated by the edge of the TNP phase in its base position, it counts as being at the edge of the TNP phase, which is not the case with *generalu* 'general' in (38). Under this approach to the edge-of-the-edge issue, the intensifier in (39), but not the adjectival complement in (38), is accessible to operations outside of the object TNP, hence it need not move via its edge.[14]

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[13] Or what is immediately dominated by another phase, see footnote 14 on AP phasehood.

[14] Bošković (2013a, 2014) argues that the highest projection in the extended domain of A (which I will refer to as traditional AP (TAP)) is also a phase. An issue then also arises regarding movement from this phasal domain for both (37) and (38). There are several options here; teasing them apart is interesting in itself but does not affect the above discussion. The issue is whether the adjectival complement will need to pass through the Spec of the TAP phase. If the TAP is a bare AP, as Talić (2015a) argues, and given Bošković's (2015a) approach to the PIC, where (contra Chomsky 2000, 2001) not just the Spec but also the complement of a phase is accessible outside of the phase, 'general' will not need to move to the Spec of the TAP phase on its way out of the TAP, otherwise, such movement will be necessary. What further complicates the situation here is that the complement of an attributive adjective must precede the adjective in SC (see (i)), which could be interpreted as indicating obligatory feature-checking movement to the TAP Spec (a position that is still dominated by the TAP phase), along the lines of German *r*-pronouns (but see Bošković 2013b for a very different perspective on this issue).

4 Why do Inherently Case-Marked NPs Move?

In this section I will briefly address the reason why inherently Case-marked elements undergo movement.

Inherent case is often associated with prepositionhood. Suppose that this is indeed the case, which means that there is a null inherently Case-marking (ICM) preposition in (1). Kayne (2000, 2005) suggests that prepositions may be generated separately from what is traditionally considered to be their complement, which then induces movement of the latter.[15] I suggest that this is what happens with null ICM Ps of the kind discussed here (note that there is no θ–relation between this P and the relevant NP, as in Kayne's cases). In particular, the verb takes NP as its object, the null ICM P is generated outside of the VP (the exact position is not important), with the NP undergoing movement to the Spec of the P, as in (40). (It is possible that the P then adjoins to the element in SpecPP, as discussed in Bošković 2005, 2013c and Talić 2013 for a number of cases in Slavic; in fact, this could be the right implementation of Kayne's P-movement from footnote 15).[16]

(i) a. generalu lojalnog vojnika b. *lojalnog generalu vojnika
general$_{DAT}$ loyal$_{ACC}$ soldier$_{ACC}$

[15] Thus, Kayne suggests the derivation in (ii) for French (i) (the subject and the auxiliary are ignored in (ii)), where *à* is generated outside of VP, with *Paul* moving to its Spec (Kayne assumes that the subsequent movement of *à* takes place because *à* is a preposition, not a postposition).

(i) Jean a donné un livre à Paul.
Jean has given a book to Paul

(ii) à [$_{VP}$ donné Paul un livre] → Paul$_i$ à [$_{VP}$ donné t_i un livre] →
$à_j$ +W Paul$_i$ t_j [$_{VP}$ donné t_i un livre] → [$_{VP}$ donné t_i un livre] t_k $à_j$ +W Paul$_i$ t_j t_k

[16] The evidence for the possibility of such movement comes from the fact that the element in SpecPP carries the preposition with it when it undergoes further movement (one such case is (i)), and from certain accent shifts that correlate with syntactic mobility (see Talić 2015b for a prosodic argument along these lines that (i) is derived as follows: *veliku* moves to SpecPP, *u* left-adjoins to it, the *u veliku* complex then moves out of the PP).

(i) U veliku je ušao kuću.
in big be$_{3SG}$ entered room
'He entered a big room.'

(40) $[_{PP}\ NP_i\ \emptyset_P \ldots [_{VP}\ V\ t_i]]$

Inherently Case-marked NPs then always undergo movement, hence only elements base-generated at their edge can move out of them. Further research is of course needed to determine whether the analysis outlined here can be maintained as the general approach to inherent Case-marking. At any rate, the pattern of extraction from inherently Case-marked NPs is at least suggestive of a unification with the ban on movement out of moved elements, given that inherently Case-marked NPs and moved elements exhibit the same kind of (in)sensitivity to extraction out of them.

It is possible that this derivation of (i) is what happens with inherent Case more generally; i.e. that the inherent Case movement discussed in the text is in fact the same as the one depicted above for (i). Under this analysis, verbs taking inherently Case-marked complements would actually take a PP complement headed by a null P (note here that Bošković 2013a argues that there is a P-like projection above inherently Case-marked NPs, which Talić 2013 argues is in fact a PP), with the complement of this null P moving to SpecPP (or a higher functional projection within the traditional PP, if there are such projections), and the P possibly adjoining to the element in SpecPP (which is not shown in (ii)).

(ii) a. $[_{VP}\ V\ [_{PP}\ \emptyset_P\ NP]]$
b. $[_{VP}\ V\ [_{PP}\ NP_i\ \emptyset_P\ t_i]]$

Inherently Case-marked NPs would then be PPs exhibiting the special behavior of the kind discussed above, with independent evidence that such special behavior is indeed attested coming from (i). Under both the analysis outlined here and the one from the text inherently Case-marked NPs move, which suffices to account for the locality effect with extraction out of them. The two analyses, however, differ in the height of this movement: under the analysis from the text inherently Case-marked NPs undergo movement above the base object position, while under the analysis outlined here their movement is object internal. As a result, at least height-wise, the analysis from this footnote does not differ from the standard treatment of inherently Case-marked elements, where they need not undergo movement. Determining the height of inherently Case-marked elements is beyond the limits of this paper, whose goal is merely to provide arguments that there is such movement, hence I leave teasing apart the two options noted here for another occasion (but see section 5 for some relevant discussion).

5 Conclusion

Addressing the puzzle of islandhood of inherently Case-marked elements, I have observed that they are not always islands. In particular, they show the same behavior regarding islandhood as moved elements. Moved elements generally disallow extraction. However, they do allow it in one context, namely for elements base-generated (i.e. undergoing feature-sharing) at their edge, which is captured by Bošković's (in press) account of the ban on movement out of moved elements. Importantly, inherently Case-marked elements exceptionally allow extraction in the same context as moved elements. Based on this, I have extended Bošković's (in press) account of the ban on movement out of moved elements, which allows such extraction in the exceptional context in question, to extraction out of inherently Case-marked elements, unifying islandhood of moved and inherently Case-marked elements. This has led to the conclusion that inherently Case-marked elements always undergo movement. I have also suggested an account of this state of affairs that appeals to the traditional intuition that inherent Case-licensing involves prepositionhood.

The suggestion that inherently Case-marked elements must undergo movement has broad consequences that cannot be explored within the confines of this paper. The suggestion, however, has the potential to provide a new perspective on a number of issues.

Consider for example the scope of Japanese *dake* 'only'. The accusative object in (41) must scope under the potential affix.

(41) Taro-ga migime-dake-o tumur-e-ru.
Taro-NOM right.eye-only-ACC close-can-PRES
'Taro can close only his right eye.' (*only>can, can>only)

Like SC, Japanese has verbs that do not assign accusative to their complement NP. Significantly, in (42), where the verb assigns inherent dative case to its complement, the object can take wide scope.

(42) Taroo-wa Daitooryoo-dake-ni a-e-ru.
Taro-TOP president-only-DAT meet-can-PRES
'Taro can meet only with the president.' (only>can, can>only)

Assuming that scope reflects structural height, the contrast in (41)-(42) can be taken to indicate that the inherently Case-marked object in (42) is higher in the structure than the structurally Case-marked object in (41), with the current suggestion that inherently Case-marked elements must undergo movement providing justification for the height difference (for similar scope data regarding *a*-marked objects in Spanish, see Torrego 1998). In other words, the scope contrast in (41)-(42) can be taken to provide independent evidence that inherently Case-marked objects are higher structurally than structurally Case-marked objects (note that the extraction test cannot be done here for independent reasons, see fn 5).[17]

An interfering factor should, however, be noted here. The current suggestion regarding inherent Case-marking can be for obvious reasons most productively explored in case-rich languages. However, such languages also tend to have a great deal of freedom of word order. This makes exploring structural relations in such languages a difficult endeavor. Furthermore, whatever operations are responsible for the freedom of word order can make the movement operation that inherently Case-marked elements undergo difficult to detect; in other words, teasing apart the (movement) operations that are responsible for the general freedom of word order and the movement that inherently Case-marked elements need to undergo is far from trivial.[18]

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[17] Nominative *dake* objects can take scope over 'can', which has been taken to indicate that nominative objects are higher than accusative objects (e.g. Koizumi 1995, Ura 1996, Nomura 2005, but see also Bošković 2012 (the source of (41)-(42)) and Takahashi 2011).

[18] For another complication, see Stjepanović (1997), who argues that one movement operation that has often been assumed to be confined to structurally Case-marked objects, i.e. object shift, is also available to inherently Case-marked objects (though it is not out of question that the more or less standard assumption that object shift is confined to structurally Case-marked elements is correct, with Stjepanović's 1997 tests detecting the effects of the movement of inherently Case-marked elements argued for here).

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Lechitic Vowel Development of Eastern Low German

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1 Introduction

This paper traces the rise of secondary palatalization (SP) in Low German (LG) from the former German state of Posen (Polish Poznań). Three descriptions from Posen show that SP is a regional feature, as shown in (1). Posen Low German (PLG) words are given with their Plautdietsch, Standard German, and English translations. Words not cognate to the PLG word are noted in quotation marks.

(1)

PLG	Plautdietsch	German	English	Source
brjal	*Brell*	*Brille*	"glasses"	Teuchert (1913)
brjǫlǫ	*brelle(n)*	*brüllen*	"roar"	Koerth (1913, 1914)
djǫnn	*denn*	*dünn*	*thin*	
mjaaš	*Mensch*	*Mensch*	*man*	
zjǫn	*Sonn*	*Sonne*	*sun*	
špjǫǫs	"Spetzbub"	"Spitzbube"	"scoundrel"	
štjaa	*stell*	*still*	*still*	
vjal	*Welle(n)*	*Wille*	*will*	

The closest relatives of PLG, Plautdietsch and English, lack reflexes of SP in any of the cognates. Standard German, while lexically more like PLG than English is, also lacks SP and shares few vowel correspondences with PLG.

Previous accounts of PLG attribute the rise of SP to Polish influence, but fail to explain how Slavic languages contributed to the development

(Koerth 1913:281, Teuchtert 1913:37). In this paper, I explain three questions regarding SP in PLG:

(2) a. ***What*** was borrowed from Slavic?
b. ***How*** did the element become a candidate for borrowing?
c. ***Who*** was responsible for the borrowing?

I present evidence that a VC co-articulation constraint from the West Slavic Lechitic sub-group is ultimately responsible for the rise of SP. The co-articulation constraint was able to enter PLG through the process of replication based on a perceived similarity between the conditioning environment in Lechitic and the consonants of PLG. Although Slavic-dominant bilinguals introduced the co-articulation pattern into PLG, the PLG reflexes are different because speakers prioritized retention of certain native LG features.

The rest of Section 1 provides background to LG in the historical Province of Posen and to theories of language contact which will help answer the questions in (2) above. Section 2 presents language-internal information about the sound inventory of PLG and the rise of SP. Section 3 provides information about the development in Lechitic and its counterpart in PLG. Section 4 gives an integrated OT analysis of SP in PLG that incorporates the findings and constraints of Sections 2 and 3. Finally, Section 5 sums up the overall findings of this paper.

1.1 Poznań as an LG Speaking Region

LG is a West Germanic language descendant from Old Saxon (9th – 12th c.) and Middle Low German (12th – 16th c.). Prior to the 12th century, LG was only spoken west of the Elbe River. During this time, LG was in contact with Polabian around Lüneberg. LG rapidly expanded to the east during the *Ostsiedlung* 'eastern settlement' period of German history. This period began in the 12th century and lasted into World War II. During the *Ostsiedlung*, LG spread as far east as present day Kaliningrad.

LG was a culturally important language along the North and Baltic Sea coasts from the 12th to the mid-17th century. During this time, the Hanseatic League, a highly successful trade group, operated in these regions. Middle Low German was the league's official trade language, both written and spoken, which provided a strong economic incentive for

non-native speakers to learn it. Even after the league collapsed, many Balto-Slavic languages previously spoken in northern Poland and Germany vanished because the speaker populations switched to LG (Prussian †17th c., Polabian †18th c., Slovincian †20th c.). Other languages, like Kashubian, underwent heavy lexical and structural borrowing from LG (Stone 2002). After World War II, the German–Polish border was redrawn and LG-speakers in Poland were relocated to Germany. As a consequence, varieties of LG from Poland underwent obsolescence as speakers adjusted to the local LG and literary German of their new home.

Documentation of PLG in the early 20th century comes from the cities of Rogoźno (German *Rogasen*) and Puck (German *Putzig*). The region historically known as Greater Poland, which encompasses Poznań, was first settled by German-speakers in the mid-12th century (Higounet 1986:205). After the initial settlement, there was a surge of German settlement in the 13th century (Higounet 1986:203,205-6).

Teuchert is the first to provide a historical analysis of PLG in 1913 in the *Bühnendeutsch* transcription system.[1] Koerth, a native LG-speaker from Rogoźno, also undertook documentation of PLG after learning of Teuchert's investigation (1913:18, 1914). Koerth found a high degree of similarity in the LG varieties spoken in Poznań, Rogoźno, Puck, Chodzież (German *Kolmar*), and Wągrowiec (German *Wongrowitz*). All reports note that Polish and LG of the region have influenced each other.

1.2 Borrowing Theories

As stated, the goals of this paper are to identify three central issues of language contact: ***what*** was borrowed, ***how*** the element became a candidate for borrowing, and ***who*** did the borrowing. Although this paper attempts to explain the first question in terms of the OT framework, the latter two questions will be answered according to the framework of Heine & Kuteva 2005 and Van Coetsem 1988.[2]

Linguistic structures can be borrowed in a process called *replication* (Heine & Kuteva 2005). In this process, a structural property of a matrix

[1] The first linguistic investigation of LG spoken in Posen was Bernd 1820. His report does not provide information about the transcription system which he used. By the 20th century, Bernd's work was considered "unusable" (Koerth 1913: 4).

[2] Traditional approaches to contact typologies e.g., Haugen 1950, Ferguson 1959, and Thomason & Kaufman 1988, are not addressed here due to space limitations.

language is integrated into the structural properties of a recipient language, when bilingual speakers identify highly comparable elements in the two structures (Heine & Kuteva 2005:3-4, 40). Although it is not explicitly stated, all OT approaches to loan phonology adaptation rely on replication. These studies claim that loan phonology adaptation must necessarily reference perceptual or articulatory matches between the recipient and donor languages in order to make sense of the outcome of loan phonology adaptation (Jacobs & Gussenhoven 2000, Alder 2005). I provide evidence that PLG incorporated a Lechitic VC co-articulation constraint based on the similarity of LG consonants to a Lechitic trigger (see Section 2.3).

In order to answer who was responsible for the borrowing, I will use VanCoetsem's framework of linguistic agentivity (later expanded by Winford 2005). The agentivity model draws on insights from language acquisition to identify structural properties typical of different contact scenarios. Every contact situation has recipient language speakers and source language speakers. If recipient language dominant speakers catalyze borrowing, they adapt structures of the source language to preexisting recipient language structures (e.g. Japanese [san·gu·ra·su] 'sunglasses' < American English [sʌn·glæ·sɪz]; Winford 2005:378). Recipient Language Agentivity tends to not introduce new structures into the recipient language and mostly enhances its preexisting structures. It is possible for Recipient Language Agentivity to introduce new structures, but these tend to be structures which already had some degree of variability in the recipient language (Winford 2005:386-7, Van Coetsem 1988). If source language dominant speakers catalyze borrowing (i.e., they are imperfect speakers of the recipient language), the structures of the source language are imposed upon the recipient language's structures (e.g. German L1 speakers replace English [θ] with [s] in *thin* and *think*; Winford 2005:380). Source Language Agentivity can bring in large systematic structural changes, possibly altering otherwise stable recipient language structures (Winford 2005:377, Van Coetsem 1988:73-4).

OT phonology usually describes Recipient Language Agentivity focusing on the phenomenon of "loan-phonology adaptation" (see Jacobs & Gusshoven 2000, Itô & Mester 1999, and Alder 2005). All OT approaches to Recipient Language Agentivity scenarios indicate that some, if not all, of the constraints of the recipient language are highly

ranked. Itô & Mester 1999's account of loan-phonology nativization in Japanese indicates that more recent loans may violate some constraints which native vocabulary cannot, but there are still native constraints which loan words do not violate.

Source Language Agentivity is not widely explored in OT contact phonology literature and the question remains open as to whether Source Language Agentivity manifests an inverse relation in constraint rankings to Recipient Language Agentivity.

2 Low German of Poznań (PLG)

This section presents data concerning the segments of PLG and the rise of SP. Section 2.2 provides the account of SP found in Teuchert (1913) and Koerth (1913, 1914). I show that their account fails to exclude cases where the development did not occur and correct this oversight in Section 2.3.

2.1 Segment Inventory

PLG has 22 consonant phones (Teuchert 1913:10; Koerth 1913, 1914). Table 1 lists the closest IPA approximations to the PLG consonant segments from Teuchert 1913.

	LABIAL	ALVEOLAR	POST ALVEOLAR	PALATAL	VELAR	GLOTTAL
PLOSIVE	p, b	t, d			g, k	
NASAL	m	n		ɲ	ŋ	
FRICATIVE	f, v	s, z	ʃ	ç	x, ɣ	h
TAP		ɾ				
LATERALS		l				
GLIDES				j		

Table 1: PLG Consonant Segments (Teuchert 1913)[3]

[3] The only *Bühnendeutsch* symbols that do not match the IPA representation are <ñ>=[ɲ], <c>=[ç], and <ʒ>= [ɣ]. In Koerth's description, it is unclear if <ʒ>, labeled as IPA [ɣ], is a fricative or a more sonorant segment. Clearly, it represents a non-plosive

The initial accounts indicate that there are roughly 20 monophthongs.[4] Table 2 provides the monophthong inventory of PLG in IPA with three height categories (Teuchert 1913:9).

LONG VOWELS	FRONT	CENTRAL	BACK
HIGH	iː · yː		· uː
MID	eː · øː		· oː
LOW	ɛː · œː	aː ·	· ɔː

SHORT VOWELS	FRONT	CENTRAL	BACK
HIGH	ɪ · ʏ		· ʊ
MID	e · ø		· o
LOW	ɛ · œ	a ·	· ɔ

Table 2: PLG Vowel Segments (Teuchert 1913)[5]

The long and short vowel inventories differ only in quantity except for [+HIGH] vowels, which also differ in laxness. Although all texts predate phonemic analysis, Teuchert notes that short mid vowels are positional variants of [ɛ], [œ], and [ɔ] before $C_{[SONORANT]}C$ clusters (1913:10). Though phonetically there are three height levels of short vowels, phonologically there are only two underlying heights: [+HIGH] and [+LOW].

Table 3 lists PLG forms affected by SP.[6]

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voiced segment, the reflex of Middle Low German *g*. Teuchert mentions that the palatal nasal is not frequently used, and assumes that it must have been more prevalent in the language at an earlier stage, but provides no evidence for this (Teuchert 1913:10).

[4] Additionally there are two diphthongs and five triphthongs; they are not involved in the development SP and will not be discussed further.

[5] In *Bühnendeutsch* orthography, long vowels are written as geminates and short vowels as singletons. All vowels are tense unless an ogonek is written underneath them in which case they are lax. Teuchert lists [æ] as a phone of PLG, but the symbol he used for this phone does not appear in any of his examples nor in Koerth's examples. Some of the final <ǫ>s are weakly nasalized, but these are reflexes of word final <en> (Teuchert 1913:5,7).

[6] PLG also has consonants which are the reflexes of older palatalization from the Ingvaeonic period in the words such as *jęęvǫ* 'to give'. For more information about other types of palatalization in PLG and their relation to inherited or contact based features, see Burns forthcoming.

	LABIAL	CORONAL	VELAR
PLOSIVE	*pjal* 'peel, Pelle' *bjan* 'feedrack, Raufe'	*tjalǫ* 'count, zahlen'	*kjal* 'ladle, Kelle'
NASAL	*mjǫl* 'garbage, Müll'		
FRICATIVE	*ffjaaste* 'window, Finster' *vjǫǫta* 'root, Würzel'	*zjǫn* 'sun, Sonne'	
TAP		*rjǫnǫ* 'run, rennen'	
LATERAL		*ljǫǫsštaf* 'stake, Runge'	

Table 3: PLG Secondary Palatalization Inventory

In addition to the segments in Table 3, PLG has initial *j* in words which were historically vowel-initial or *h*-initial (e.g. *jan* < *hen* 'hen', *jalbǫǫzǫ* < *elbogo* 'elbow'). *H*-initial words underwent the changes *h* > *hj* > *j* (Teuchert 1913:37).[7]

There is evidence that SP was contrastive at one point, but synchronic variation suggests that speakers reanalyzed these segments as allophones in free variation with other segments in the inventory. Example (3) provides evidence of three distinct phonemic statuses.

(3)	Contrast:	*mjǫl* : *mǫl*	'garbage: mole'
	Free Variation 1:	*štjǫǫtǫ* : *štǫǫtǫ*	'tumble INF: tumble INF'
	Free Variation 2:	*bjan* : *bǫn*	'feed rack: feed rack'

The minimal pair 'garbage' and 'mole' shows contrast between palatalized and plain consonants. The documentation shows more instances of allophony, which fall into one of two types. Free Variation Type 1,

[7] Even though <*š*> and <*j*> don't appear with SP, these segments underwent a similar change exemplified by the words *šaava* 'shard, Scherben' < Middle Low German *scherve* 'shards' and *jaast* 'barley, Gerste' < **jerste* <Middle Low German *gerste*. Only three segments from Table 1 can occur word initially and do not exhibit evidence of the changes in Table 3: <*d*>, <*n*>, <*g*>. For more on the Eastern LG reflex *j* < Middle Low German *g*, see Burns (forthcoming).

exemplified on the root of the verb 'tumble', exhibits alternation between palatalized and plain consonants. Free Variation Type 2, exemplified in 'feed rack', is the most common type of allophony across all texts. In this type of free variation, the palatal off-glide of the consonant is removed and the quality of the immediately following vowel changes.

2.2 Early Accounts of Secondary Palatalization (SP)

Teuchert identifies the rise of SP as contingent on the diphthongizing of /ɛ/ and /œ/ into [ja] and [jɔ] respectively (Teuchert 1913:36-7).[8] Typologically, the most common triggers of SP are high front vowels and *j* (Bateman 2007, 2011; Bhat 1978). If low front vowels trigger palatalization, higher front vowels will also trigger it (Bateman 2007:64). Seemingly contradicting this generalization, both authors are correct to attribute SP to [+LOW] vowels. Example (4) shows that SP did not develop after other front vowels.

(4)	Vowel	PLG	Translations	(Teuchert 1913)
	[i:]	*kriit*	'chalk, Kreide'	
		liim	'lime, Leim'	
	[ɪ]	*blįš*	'blaze, Blesse'	
		tsįbǫlə	'onion, Zwiebel'	
	[y:]	*büüda*	'bag, Beutel'	
		düüva	'devil, Teufel'	
	[ʏ]	*šüpt*	'3SG swills, säuft'	
		drüpo	'drop, Tropfen'	
	[e:]	*keez*	'cheese, Käse'	
		zeep	'soap, Seife'	
	[ø:]	*zööt*	'sweet, süß'	
		zöökǫ	'search, suchen'	

None of the examples in (4) have reflexes of SP, but just as important, none of them show evidence of diphthongization.[9] PLG SP arose due to yodation after the diphthongization of /ɛ/ and /œ/ to [ja] and [jɔ]. The

[8] The alternation *fjǫ̈st* : *fǫ̈st* 'first' is an exception to the change in quality of the vowel's nucleus. The original *œ* has not been lost in either variant.

[9] The only word with SP after a high front vowel is *bjįd* 'poverty' (<Polish *bieda* 'poverty'). SP in this word is independent of LG specific innovations.

rules presented in (5) capture the original author's account of the rise of SP.

(5) *Stage 1:* $\left\{\begin{matrix}\varepsilon\\ œ\end{matrix}\right\} \rightarrow \left\{\begin{matrix}ja\\ jɔ\end{matrix}\right\}$

Stage 2: C[jV] → [C^{j}]V

The two types of allophony observed in Section 2.1 can be attributed to repairs that target different stages of the developments in (5). Free Variation Type 1 removes SP after Stage 2 of the change has applied. Free Variation Type 2 arose from an attempt to reverse engineer SP by removing Stage 1 of the change from some words, thus yielding tokens that appear not to have undergone any of the changes in (5) (e.g. *bjan* : *bęn* 'feed rack', *jal* : *hǫ̈l* 'space behind the oven/hell').[10] Type 2 repairs sometimes only targeted the vowel in the case that the initial consonant was not recoverable, as in *jamp* : *jęmp* 'hemp' (Teuchert 1913:36). Free Variation Type 2 was common among younger speakers from Posen and shows that these speakers had some awareness that SP corresponded to plain consonants and vowels of a different quality (Teuchert 1913:36).

2.3 Diphthong Over-generation and Revision

In order to model the rise of Stage 1 diphthongs in an OT framework, three constraints are needed: one promotes diphthongization, one preserves roundness of the input vowel, and one favors retention of the original frontness feature on the initial mora. These are listed in (6).

(6)
- **Δμμ**: Promotes diphthongization and increased featural distance across two morae.
- **Ident-IO ROUND**: Favors outputs which retain the original round feature of the input vowel.
- **Align-L Faith [FRONT]**: Favors retention of the original frontness feature only on the first mora.

[10] The word *hǫ̈l* 'hell' seems to have been borrowed from a different West Germanic language. If *hǫ̈l* were the actual repair, *jǫl* should have been the palatalized variant. This provides evidence that speakers were actually replacing the palatalized variants of words with words from other regions rather than reverse engineering the change.

The broadest generalization that the constraint set must capture is the fact that this change involves vowel unpacking. VOWEL UNPACKING is a type of diphthongization where the original quality of the input vowel is no longer present as a single unit; rather the original features are distributed across two morae (Anderson 1972). Unpacking favors larger distances between two morae than other diphthongization processes such as breaking.[11] Δμμ assigns a maximum of two violations to candidates that do not exhibit either frontness distinction across morae or a maximal height difference across morae. As an entailment, this constraint assigns a critical violation to vowels lacking two morae. Ident-IO ROUND favors outputs which retain the original round feature of the input vowel and incurs a violation for any number of morae that are unfaithful to the

Input [ɛ]	Δμμ	Align-L	Faith$_{[FRONT]}$	Ident-IO ROUND
a. ɛ	*!			
b. jɛ	*!			
☞ c. ja				
d. jɔ			*	
e. jœ	*!		*	
f. je	*!			
g. wa		*	*	
h. wɔ	*!	*	**	

Input [œ]	Δμμ	Align-L	Faith$_{[FRONT]}$	Ident-IO ROUND
a. œ	*!			
b. jɛ	*!			**
c. ja				**
☞ d. jɔ				*
e. jœ	*!			*
f. je	*!			**
g. wa		*		*
h. wɔ	*!	*		

original round feature.[12] Align-L Faith [FRONT] requires the original frontness feature of the vowel to be on the first mora. These constraints are modeled in Tableaux 1a and 1b.

[11] Minkova & Stockwell (2003) use the constraint HEARCLEAR to capture diphthongization in the Great English Vowel shift. This constraint favors outputs with large perceptual distance between two morae. I use a constraint called Δμμ because perceptual distance necessarily relies on access to a listener's perceptual categories, which is difficult to define diachronically.

[12] PLG retains front rounded vowels (e.g. *tüšo* 'between' cf. Plautdietsch *twischen*) even though they are frequently lost in West Germanic languages spoken outside of

Tableau 1a is the most straightforward: the winning candidate, C, accurately reflects the correct reflex and incurs no violations. Tableau 1b provides evidence that Ident-IO ROUND cannot be the highest ranked constraint or else Candidate D, the correct one, would be out too early in the running. In Tableau 1b, candidates with rounded on-glides are dispreferred because the original frontness feature is not retained on the leftmost mora. There is no clear ranking of Δμμ and Align-L Faith [FRONT].

Although (5) and (6) produce the expected outputs, they over-generate diphthongs across the entire vowel inventory. To eliminate this problem, we need to recognize that diphthongization has a conditioning environment.[13] Example (7) shows that place features of the post-vocalic consonant conditioned diphthongization.

(7)	Input Vowel	PLG	Translation	Consonant
	[ɛ]	*ęma*	'receptacle, Eimer'	BILABIAL
	[œ]	*šǫ̈ba*	'white bean, Bohne'	BILABIAL
	[ɛ]	*tjalǫ*	'to count, zahlen'	CORONAL
	[œ]	*zjǫn*	'sun, Sonne'	CORONAL
	[ɛ]	*bęęxiŋ*	'berry, Beeren'	DORSAL
	[œ]	*brǫ̈ct*	'brought, brachte'	DORSAL

Low vowels only diphthongized if they immediately preceded a coronal. This generalization holds in all three sources. Two surface exceptions to it are *jaap* 'help', which had an *l*, and *jamp* 'hemp', which had an *n* (cf. Old English *hænep*, Russian *конопля*, Greek *κάνναβις*). (8) presents a revised diphthongization rule.

(8) $\begin{bmatrix} \varepsilon \\ \text{œ} \end{bmatrix} \rightarrow \begin{bmatrix} \text{ja} \\ \text{jɔ} \end{bmatrix} \; / \_\_\_ C_{[\text{coronal}]}$

Diphthongization, which ultimately leads to the rise of SP, occurred in a highly restricted environment. The environment found in PLG is neither relevant to the rise of SP in other varieties of West Germanic which have this feature (e.g. Central Yiddish; Jacobs 1996) nor is it a common

predominantly German speaking regions (e.g. Texas German, Plautdietsch, Pennsylvania Dutch, Central Yiddish, etc.).

[13] Koerth 1913 is aware that umlaut does not condition palatalization (1913:281).

environment cross-linguistically for the rise of SP (Bateman 2007, 2011). The next section explores a similar environment to the one in (8) that historically triggered vowel movement in Lechitic.

3 Lechitic Consonant Influence on Vowel Development

The previous section closed with a descriptively adequate formulation of diphthongization, which feeds SP. This section advances towards the goal of explanatory adequacy by presenting information about VC developments in the Lechitic languages which LG was in contact with during the *Ostsiedlung*. Examples are presented from Polish, Kashubian, and Polabian, but the majority are from Polish because it is the best understood language of the group.

3.1 Lechitic VC Co-Articulation

Historically, Lechitic languages developed leftward-spread of the feature [+BACK] of a coronal consonant on the immediately preceding vowel.[14] This development in Polish is believed to have started in the 9th century and written evidence of adjustments are attested as late as the 13th century (Stieber 1973:24-6). Table 4 provides reflexes of this change in three Lechitic languages.[15]

Coronal[+BACK]		Coronal[-BACK]		Source
świat	world NOM	*świecie*	world LOC	Polish (Rothstein 2002: 696)
kościół	church NOM	*kościele*	church LOC	
miara	measure N	*mierzyć*	measure V	
miasto	town NOM SG	*miesce*	town LOC SG	Kashubian (Stone 2002:768)
l'otü	summer/year	*letě*	summer LOC	Polabian (Polański 2002:806)
corně	black	*carnaićă*	blackberry	
diśǫtě	tenth	*disąt*	ten	

Table 4: Reflexes of Lechitic Vowel Backing

[14] Stieber (1973) refers to this process as "vowel metaphony before hard dentals".

[15] In Slavic languages, the ogonek represents a nasalized vowel. The vowel ě represents a low front vowel. The breve mark in Polabian represents a short reduced vowel.

Polish and Kashubian synchronically alternate between regular coronal consonants and their palatal counterparts. The Polabian data is obscured by lack of orthographic representation of palatalization on the consonant which triggered the change, but there is still alternation of the vowel. Polabian also differs from the other two Lechitic languages in its treatment of <a> as [-BACK]. The types of changes exemplified in Table 2 also occurred in Sorbian and Eastern Slovak (Stieber 1973:24).

Although we do not know the exact phonetic realization of the [+BACK] segments which triggered the change, if other Slavic languages provide a window into the past, the non-palatal consonants might have been slightly velarized as in current Russian (Padgett 2011). The co-articulatory changes in the Lechitic vowel system can be summed up in (9).

(9) $\left[\begin{matrix} e \\ ę \\ ě \end{matrix}\right] \rightarrow [+back] / \_\_\_\_ C_{[coronal, +back]}$

The constraints that capture Lechitic VC co-articulation are listed in (10).

(10)
- **Ident-IO Cor [±BACK]**: Favors retention of input coronal features.
- **Match (Corα, V[-HIGH, -BACK], αBACK)**: Triggers feature matching between non-high vowels and coronals.[16]
- **Ident-IO HEIGHT**: Favors retention of the original input height.

In this change, the quality of the vowel depends on whether the following coronal consonant is front or back (i.e., palatal [-BACK], non-palatal [+BACK]). In OT we need two constraints to capture the movement of the vowel to match the following consonant's backness. The first is a faithfulness constraint Ident-IO Cor [±BACK], which incurs a violation if the original coronal changes its quality. The second constraint is a surface markedness constraint, Match (Cor,V[- HIGH -

[16] This feature matching surface constraint is first proposed in Orgun 1995. Today, surface-level feature matching is dealt with in the Agreement By Correspondence (ABC) framework (Rose & Walker 2004). I have not used the ABC framework because some Slavic phonologists have an association of CORR with base-reduplicant (B-R) and input-output (I-O) correspondence. To avoid confusion, I adopt MATCH.

BACK], αBACK), which penalizes non-high vowels that do not match in backness with the immediately following coronal. This constraint is shortened to Match (Cor,V, αBACK) in the tableaux. Lechitic disfavors changes in height, which is captured in the faithfulness constraint Ident-IO Height. Tableaux 2-3 show the output of these constraints in Polish *e* and *ě*. Although there is no discernible ranking of the constraints, I have placed coronal faithfulness as the leftmost constraint because the only features which are eligible to change are vowel features.

Input [eβlα]	Ident-IO Cor[±BACK]	Match (Cor,V, αBACK)	Ident-IO HEIGHT
a. [eβlα]		*	
b. [eαlʲα]	*!		
c. [ɛβlα]		*	*
☞ d. [oαlα]			
e. [ɔαlα]			*
f. [aαlα]			*

Input [eβlʲα]	Ident-IO Cor[±BACK]	Match (Cor,V, αBACK)	Ident-IO HEIGHT
☞ a. [eαlʲα]			
b. [oαlα]	*!		
c. [ɛαlʲα]			*
d. [oβlʲα]		*	
e. [ɔβlʲα]		*	*
f. [aβlʲα]		*	*

Tableaux 2a and 2b: Mid-High Vowel with [±BACK] Coronal

Input [ɛβlα]	Ident-IO Cor[±BACK]	Match (Cor,V, αBACK)	Ident-IO HEIGHT
a. [eβlα]		*	*
b. [ɛβlα]		*	
c. [oαlα]			*
☞ d. [ɔαlα]			
e. [aαlα]			*

Tableau 3: Low Front Vowel with [+BACK] Coronal

In Tableaux 2a and 2b, the winning candidate is the historically correct reflex of the change. In Tableau 3, Candidate D, the winner, has the phonetic realization [ɔ] which goes against the generally accepted view that [ɛ] developed into [a] (Stieber 1973; Carlton 1991:175-177, 252-253; Polański 2002:801). It is possible that the phonetic output actually was [ɔ], but phonemically /a/. It is the commonly accepted view that short [a] in Polish developed into [o] (Stieber 1973:25). This type of vowel raising usually requires an intermediate phase of [ɔ] unless it is conditioned by another process.

3.2 The Role of Language Contact in PLG

There are clear similarities between the PLG diphthongization rule and Lechitic VC co-articulation as shown in rule notation in (11).

(11) *PLG:* $\left\{\begin{matrix}\varepsilon\\ œ\end{matrix}\right\} \rightarrow \left\{\begin{matrix}ja\\ jɔ\end{matrix}\right\} \; / \_\_\_C_{[coronal]}$

Lechitic: $\left\{\begin{matrix}e\\ ę\\ ě\end{matrix}\right\} \rightarrow [+back] / \_\_\_\_C_{[coronal, +back]}$

The rule notation given in (11) highlights the similarity of the input and trigger of the change. The trigger is of particular interest because typologically, coronals articulated with a front tongue body, often the default for West Germanic coronals, promote fronting of back vowels (Flemming 2003). Coronals which promote retraction of vowels are those articulated with a back tongue body (Flemming 2003). These tendencies implicate the Slavic [±BACK] distinction as the source of vowel backing.[17]

[17] Most West Germanic languages do not have [±BACK] contrast encoded in the phonology of coronals. While some West Germanic languages have individual coronal phonemes with [±BACK] allophony, e.g. velar and non-velar l, the feature is not present in the full coronal inventory (see Russ 1990). Vocalized reflexes of *l* in PLG, e.g., *jaap* 'help' and *štjaa* 'still', indicate that PLG had velar reflexes of *l* at one point. However, the fact that the velar *l* did not prevent the alveolar *l* from participating in the vowel backing rule indicates that the velar *l* might have arisen after the Lechitic rule was already in place.

The treatment of loan segments in Slavic is best understood in terms of Russian loan phonology literature. This body of research provides evidence that unless a consonant is either already palatal or in the presence of a conditioning vowel, it will be interpreted as [+BACK] in Russian, e.g. *Гёте* [gʲətʲe] 'Goethe' < Standard German [gø:tə], *ликёр* [lʲikʲor] 'liqueur' < French [likœ:ʁ], but *кок* [kok] 'chef' < Dutch [kɔk] (Padgett 2003, Antonyuk-Yudina 2009).

Russian shows evidence that [+BACK] consonants have some velarization. The degree of velarization in [+BACK] consonants varies, but there is no variation in the degree of palatalization of [-BACK] consonants; either a consonant does or doesn't have palatalization. This implies that unless a loan segment has a cue that it should be considered palatal, it will be shuffled into a set of [+BACK] consonants that can be realized with varying degrees of velarization. For recent borrowings, alveolar consonants are especially susceptible to being interpreted as [+BACK], more so than either dorsal or labial consonants, even if they are in the presence of a [-BACK] vowel (Antonyuk-Yudina 2009, Holden 1976). If one can expand the Russian observations to earlier stages of Lechitic, the basic allophones of West Germanic coronals best correspond to [+BACK] coronals.[18]

The incorporation of VC co-articulation into PLG must still be considered a phonological borrowing and not a phonetic one. If this were a phonetic borrowing, we would expect that all [+BACK] consonants would trigger diphthongization to occur, but only coronal triggers do so.

Taken together, the diphthongization in PLG is most likely due to Source Language Agentivity. Similar to other case studies of Source Language Agentivity, PLG exhibits cross-linguistically marked innovations which occur in otherwise stable part of the grammar.

4 Constraint Integration in Language Contact

As stated in Section 3, the change which takes place in Lechitic languages is triggered by the [±BACK] quality of a coronal interacting with a vowel. Once Lechitic-speakers align the LG consonant inventory

[18] In Modern Polish, the [-BACK] lateral is a non-palatalized alveolar consonant, and the [+BACK] lateral is a labio-velar glide. This is not the case for older stages of Polish; the [-BACK] lateral was a palatalized alveolar, and the [+BACK] lateral was a non-palatalized alveolar.

with their [+BACK] consonant inventory, all one would need for the Lechitic rule to operate in LG would be a coronal following a lower front vowel.

Now that we have accounted for how the Lechitic trigger aligns to the LG consonant inventory, the constraints of the Lechitic change in (10) can be integrated with PLG constraints in (6) with only two revisions. (i) The Match constraint in PLG is revised to target [+LOW -HIGH] vowels and (ii) Δμμ, which leads to over-generation, is removed because it is not the motivation for diphthongization. Diphthongization is actually an artifact of the interaction of the Lechitic Match and the native Faith [FRONT] constraints.

Tableaux 4 and 5 model the integrated constraints. Candidate A represents the output selected by other varieties of LG and Candidate B represents the output selected by Lechitic languages. I have not provided any candidates which violate the coronal identity constraint because the quality of the consonant never changes in either the Germanic or the Lechitic data.

Input [ɛl]	Align-L	Faith$_{[FRONT]}$	Ident-IO	Cor[±BACK]	Match (Cor,V, αBACK)	Ident-IO Round	Ident-IO HEIGHT
a. $ɛ_{\beta}l_{\alpha}$					*!		
b. $a_{\alpha}l_{\alpha}$	*!						
c. $j_{\beta}ɛ_{\beta}l_{\alpha}$					*!		*
☞ d. $j_{\beta}a_{\alpha}l_{\alpha}$					*		*
e. $j_{\beta}ɔ_{\alpha}l_{\alpha}$					*	*	*
f. $j_{\beta}e_{\beta}l_{\alpha}$					*!		**
g. $w_{\alpha}a_{\alpha}l_{\alpha}$	*!					*	*

Tableau 4: Mid-Low Front Unrounded Vowel with Alveolar

Input [œl]	Align-L Faith$_{[FRONT]}$	Ident-IO Cor[±BACK]	Match (Cor,V, αBACK)	Ident-IO Round	Ident-IO HEIGHT
a. $œ_{\beta}l_{\alpha}$			*!		
b. $ɔ_{\alpha}l_{\alpha}$	*!				
c. $j_{\beta}ɛ_{\beta}l_{\alpha}$			*!	**	*
d. $j_{\beta}œ_{\beta}l_{\alpha}$			*!	*	*
e. $j_{\beta}a_{\alpha}l_{\alpha}$			*	**	*
☞ f. $j_{\beta}ɔ_{\alpha}l_{\alpha}$			*	*	*
g. $j_{\beta}e_{\beta}l_{\alpha}$			*!	**	**
h. $w_{\alpha}ɔ_{\alpha}l_{\alpha}$	*!				*

Tableau 5: Mid-Low Front Rounded Vowel with Alveolar

Both Tableaux 4 and 5 indicate that the native Align-L Faith[FRONT] must outrank the borrowed Match constraint or else the correct candidates would both lose. Additionally, the borrowed Match constraint must be ranked higher than the native Ident-IO ROUND. If Ident-IO ROUND were ranked higher than Match, then Candidate A, the original input, would win in Tableau 5. This gives us the relative constraint ranking Align-L Faith [FRONT]>>Match (Cor,V, αBACK)>> Ident-IO ROUND. There is no indication of a relative ranking of Ident-IO ROUND and Ident IO-HEIGHT.

The pattern that emerges from the constraint rankings is that a native constraint favoring faithfulness to the LG input vowel outranks the Lechitic constraint which mediates the quality of the output vowel. Even scholars who do not work in OT can appreciate the generalization captured by the constraints: Even though the Lechitic pattern of vowel assimilation has been replicated into PLG, it has not overridden the core features of this LG variety. PLG still favors preservation of rounding and frontness of the original input vowel.

The finding that some LG constraints still outrank the borrowed Lechitic constraint also runs counter to what we might expect of Source

Language Agentivity. We would generally expect that changes triggered by Source Language Agentivity are due to the fact that speakers of the source language (Lechitic) are imperfect speakers of the recipient language (LG). Instead, we find that speakers of the source language exhibit sensitivity to features of recipient language, including features which are absent in the Slavic source (i.e., front rounded vowels). This indicates that the contact situation in the Posen region is not as simple as the type of contact scenarios frequently explored in the OT contact literature.

5 Conclusion

The rise of PLG SP is an artifact of diphthongization which developed due to replication of a Lechitic VC co-articulation constraint into LG. Slavic-dominant bilinguals most likely introduced the constraint into LG because diphthongization relies on a non-native [±BACK] contrast to be triggered. Even though LG does not have this contrast, Slavic-dominant speakers could make an equivalence mapping between their conditioning phonemes and the alveolar phonemes of PLG.

Although there is strong evidence that Lechitic-speakers introduced the change into LG, the outcomes of the change differ in the two sets of languages. These differences can be modeled as differences in constraint ranking which suggests that Slavic-speakers who introduced the change into PLG were already sensitive to phonemic properties of LG absent in Lechitic. It is not clear if this is typical of Source Language Agentivity, but the typology of constraint ranking in language contact has not been addressed in OT contact literature and deserves more attention.

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The Real(is) Distinction in *before* and *after* Clauses: A Cross-Linguistic Study·

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This paper argues for an inherent difference in the selectional properties of *before* and *after* clauses cross-linguistically. We provide evidence that *before* selects for irrealis mood, whereas *after* selects for realis mood. We are looking at Polish, German, and French, but also Turkish, Korean, and Japanese, and provide a uniform analysis of the disparate morphology in *before* clauses in these languages. We show that the presuppositions of the clauses introduced by *before* and *after* vary systematically, which fact explains their selectional properties. We also discuss different ways of marking of irrealis mood itself, e.g. counterfactual, or presupposition-free, showing that these different

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interpretative possibilities correlate with some other properties of languages in question, i.e. the available presuppositions of the indicative mood and quantificational status of their tenses.

1 Diverse Paradigms for *before* and *after*

Cross-linguistically *before* clauses may appear with subjunctive, or more generally with irrealis[1] morphology. This contrasts with *after* clauses, which are restricted to indicative/realis mood. Traditionally, *before* and *after* have been associated with a difference in quantificational power. *Before* has been argued to be universally quantifying over the times in the denotation of the temporal clauses (1a), whereas *after* was associated with existential quantification (1b) (Heinämäki 1972, Landman 1991, Valencia et al. 1992, Ogihara 1995).

(1) a. A before B iff $(\exists t \in A)\ (\forall t' \in B)\ t<t'$
b. A after B iff $(\exists t \in A)\ (\exists t' \in B)\ t>t'$

Since the domain of the universal quantifier can be empty, the condition (1a) can be satisfied vacuously. This is not the case with *after* (1b), where the existential presupposition holds. This is consistent with our claim that *before* clauses do not make a statement about whether their complement must, can, or mustn't be true across all accessible worlds (see also Anscombe 1994).

To capture the irrealis and realis contrast, in the present paper, we are using a notion of veridicality as defined e.g. in Giannakidou (1997, 1999, 2009, et seq.), among others, where a context is veridical, if it entails the truth of a clause in that position in some epistemic model.

We argue that *after* clauses presuppose that their complement is veridical. Their veridicality is inherent and does not depend on the context. This contrasts with *before* clauses, in which veridicality can appear only as function of context.

This leads to a certain prediction: if a language has a special irrealis morphology available, it will employ it in *before* clauses, but not in *after* clauses.

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[1] In this paper, we use *irrealis* mood as an umbrella term incorporating both subjunctive and 'non-assertion'.

Polish provides a straightforward confirmation of this. Subjunctive mood can be used in this language in *before* clauses (2a), but not in *after* clauses (2b):

(2) a. Jan wyszedł zanim Maria spytała -(**by**) go o pieniądze[2].
Jan left before Maria asked -SUBJ him about money
'Jan left before Maria asked/could ask him about money.'

b. Jan wyszedł po tym jak Maria spytała -(***by**) go o
Jan left after it how Maria asked -SUBJ him about
pieniądze.
money.
'Jan left after Maria asked/could ask him about the money.

The use of subjunctive in Polish *after* clauses leads to ungrammaticality, unlike with *before* clauses. Interestingly, the reading we obtain with subjunctive marking here is counterfactual.

French also uses subjunctive in *before* clauses (3a) but indicative in *after* clauses (3b):

(3) a. Jean est sorti avant que Marie {**vienne/*est venue**}.
Jean AUX left before that Marie came.SUBJ/IND
'Jean left before Marie came.'

b. Jean est sorti après que Marie {**est venue/*vienne**}.
Jean AUX left after that Marie came.IND/SUBJ
'Jean left after Marie came.

Schlenker (2005) argues that French subjunctive does not carry any presuppositions and appears as the elsewhere form to avoid presupposition clashes. This is what we expect if *before* indeed differs from *after* in the way we sketch here.

Importantly, the difference between *before* and *after* clauses we postulate here is not limited to Indo-European languages. Below we present instances from the Altaic family: Korean, Turkish, and Japanese. These languages also employ different strategies to mark *before* and *after* clauses.

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[2] Unless indicated otherwise, the data comes from the present authors' intuitions.

Korean uses the nominalizer *–ki* in *before* clauses, and a factive relativizer *–n* in *after* clauses.

(4) a. John-i [Mary-ka tochakha -{**ki/*n**}ceney] ttenassta.
John-$_{NOM}$ Mary-$_{NOM}$ arrive -*KI/N* before left
'John left before Mary arrived.'
b. John-i [Mary-ka tochakha -{**n/*ki**}hwuey] ttenassta
John-$_{NOM}$ Mary-$_{NOM}$ arrive -*N/KI* after left
'John left after Mary arrived.'

As the examples in (4) show, the choice of the nominalizer and the relativizer in Korean is strongly dependent on a temporal adverb. The factive relativizer *–n* is ungrammatical when used in the clause introduced by *before.* It is perfectly acceptable, however, when the clause contains the complement of *after.* This shows that both expressions differ in their semantic requirements, as they are associated with different grammatical mood. *After* being associated with veridicality requires the element carrying factive presuppositions. *Before*, on the other hand, cannot associate with this element, therefore Korean uses the presupposition- free nominalizer *–ki* in these clauses.

Turkish (5) uses non-factive nominalizer *–mA* (5a), in *before* clauses, Interestingly, this element is ambiguous between the negation marker and a nominal marker. In *after* clauses, however, this language employs a factive nominalizer *–DIG* (5b):

(5) a. John [Mary gel -{**me/*dik**}-den önce] git-ti.
John Mary come -*MA/DIG* -$_{ABL}$ before go-$_{PAST}$
'John went before Mary came.'
b. John [Mary gel -{**dik/*me**} -ten sonra] git-ti.
John Mary come -*DIG/MA* -$_{ABL}$ after go-$_{PAST}$
'John went after Mary came.'

In Japanese, the difference between *before* and *after* manifests itself in the choice of tense marking. Namely, *before* clauses cannot be marked with past tense (6a), and the language must use so called 'non-past'. Japanese *after* clauses, on the other hand, can have past tense marking (6b). Japanese past tense presupposes that the embedded event has taken place, but non-past carries no such presupposition.

(6) a. John-ga [Mary-ga tuk/tui-{**u**/***ta**} mae]-ni deteit-ta.
John-NOM Mary-NOM arrive -NPST/PAST before-LOC go.out-PAST
'John went out before Mary arrived.'

b. John-ga [Mary-ga tui/tuk -{**ta**/***u**} ato]-ni deteit-ta.
John-NOM Mary-NOM arrive -PAST/NPST after -LOC go.out-PAST
'John went out after Mary arrived.'

The distinction into presuppositional marking in *after* clauses versus the form devoid of such content in *before* clauses aligns in this language according to the observed pattern.

The table below summarizes the distribution of the forms in *before* and *after* clauses in the languages we have investigated:

	Marking in *before*-clauses			Marking in *after*-clauses
	veridical	non-committal	counterfactual	
Korean	*-ki*	*-ki*	*-ki*	*-n*
Turkish	*-me*	*-me*	*-me*	*-diğ*
Japanese	non-past	non-past	non-past	past
French	subjunctive	subjunctive	subjunctive	indicative
Polish	indicative	indicative	subjunctive	indicative
German	indicative	indicative	counterfactual	indicative

Table 1: Cross-linguistic distribution of forms in *before* and *after*.

In clauses introduced by *after*, the languages in focus tend to use presuppositional/factive forms, i.e. marking associated with the indicative mood. This contrasts with *before* clauses, in which we observe two general patterns. One group of languages: Korean, Turkish, Japanese, or French, uses special irrealis morphology, which is characterizing by the lack of tense (Korean or Turkish) or non-factiveness. Another pattern is

exemplified by Polish and German, where indicative mood is used with past tense marking for non-committal contexts. In stronger, anti-veridical, or counterfactual contexts, Polish uses subjunctive as in (2a). Therefore, the marking in *before* clauses depends on whether a language in question has a special dedicated form for its counterfactual contexts, or whether these readings have to be marked by one broader non-veridicality marking. We take marking in languages like Korean, Turkish, and Japanese, as giving us insight not only into varying properties of *before* and *after* cross-linguistically, but also into the status of tense in indicative mood. In Polish and German it is presupposition-free, hence can be used both in veridical and non-veridical contexts of *before*, as well as with strongly veridical *after*. This contrasts with French indicative which carries independent presuppositions and therefore can never be used with *before* clauses. The next section explains how these readings arise in the scopes of *before* and *after* in languages under discussion.

2 Interpretation of Cross-Linguistic Facts and the Formal Account

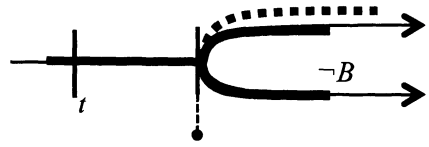
We argue that cross-linguistic facts cited in the previous section point towards an inherent asymmetry between *before* and *after* clauses. In this section, we formally derive these differences between *before* and *after* and we offer a unification of seemingly different markings in *before* clauses.

In our account, we follow Beaver & Condoravdi (2003) and Sharvit (2013) in assuming an *earliest*-operator (7) that defines *before* (8) and *after* (9). The use of the *earliest* operator basically derives the postulated non-veridical meaning of *before* clauses and the veridical meaning of *after* clauses. Consider the semantic interpretation of each of them below. The diagrams for *before* (8b) and *after* (9b-c) illustrate a temporal relationship between the *earliest* operator and the worlds A and B, associated with the matrix clause and these different temporal adjunct clauses.

(7) $earliest = \lambda P_{<i,t>}$. the earliest time t such that $P(t)$

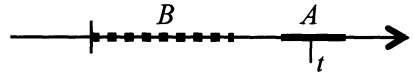
(8) a. $[\![A\ before\ B]\!] = \exists t \in A: t < earliest(B)$

b.

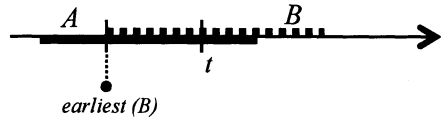


(9) a. $[\![A \textit{ after } B]\!] = \exists t \in A: t > \textit{earliest}(B)$

b.



c.



For *before* (8a-b), B is left-bounded and *A before B* is true as long *B* does not start before *A*. Importantly, it is not necessary for *B* to start at all in the current world. The *earliest* operator can be undefined in the world of evaluation, and relativized to a set of alternative worlds (see also Condoravdi 2010). This allows for capturing the inherent non-veridicality of *before*.

Languages may deal with non-veridicality differently. We propose that if a language has a verbal marking without presuppositions of factivity, but with tense-shiftability (Sharvit 2013), it will use it across all subcategories of non-veridicality, as a way to avoid a presupposition clash. This is the case in Korean, Turkish, Japanese, and French. If a language doesn't have such marking, it will use the best possible alternative. Cross-linguistically, there is a tendency to minimize the presupposition-carrying resources in the complements of *before*. This is predicted by the analysis of *before* as inherently non-veridical, and thus favoring lack of commitment to the truth of the embedded proposition, and lack of assertion.

The stronger, anti-veridical reading of *before*-clauses arises as a function of its non-veridical semantics (with application of *earliest*) and

possibly an additional contribution of inherently non-veridical constructions (e.g. subjunctive or counterfactual), negation (which could be presupposed in the lexical meaning of a predicate, the context, or overtly expressed as expletive/evaluative negation (see also Yoon 2010)), or world knowledge. This has the semantic effect of all accessible worlds being complements of B worlds (¬B). Polish (10a) below and (10a-b) from Austrian German demonstrate the counterfactual reading of *before* complement.

(10) a. Mozart zmarł zanim skończył (–by) Requiem. (Polish)
Mozart died before finished -SUBJ Requiem.'
'Mozart died before he finished the Requiem.'

b. Der Mozart ist gestorben bevor er das Requiem
the Mozart is died before he the Requiem
fertigkomponiert hat. (Austrian German)
complete.composed has
'Mozart died before he finished the Requiem.'

Polish has an option of obtaining counterfactual reading by using subjunctive morphology. However, even without it, counterfactual reading is available due to our knowledge of how death works. This is how this reading arises in Austrian German, as well. With *after* clauses, counterfactuality is possible only in the presence of additional elements, such as the null operator in conditionals. This is because with *after*, for the existential presupposition to be satisfied, *B* has to occur, and it has to be after *A*'s beginning. The termination of *A* is not crucial in these cases, and an overlap is possible between some periods in *A* and *B* as shown in (9c). Importantly, at the time of the matrix event *A*, the embedded event *B* must already have started. Therefore, *after* is always veridical, and we correctly predict realis morphology with presuppositions of factivity in languages that have such forms.

Schlenker (2005) argues that irrealis morphology is excluded in *after* clauses because languages must choose the morphology with the strongest possible presupposition according to 'Maximize Presupposition!' requirement. This also correctly predicts why languages either tend to not use presuppositional forms in *before*, or use markings like subjunctive to express counterfactuality (e.g. Polish).

A few words regarding Polish and German forms used in complements of *before* clauses. As we have indicated in Table 1, these two languages use indicative mood to express non-veridical contexts there, with Polish using subjunctive in counterfactual contexts ((2a) and (10a)). Given that *before* requires its complement to be irrealis, the use of indicative in Polish and German may seem like a problem for the analysis. To resolve this, we assume with Sharvit (2013) that Polish and German have pronominal tense (Partee 1973), which lacks presuppositions about the truth ('p-factivity' in Sharvit 2013) or time anchoring (Sharvit's (2013)'p-shiftability') of the denoted event. Such pronominal tense differs from the quantificational tense, attested in Korean or Japanese, in which past tense is the existential quantifier over times. The existential presuppositions associated with such quantificational tenses arise as a result of existential closure. This has consequences for the asymmetry in the availability of mentioned 'p-shiftability' in Polish and German (non-p-shiftable) vs. Japanese and Korean (p-shiftable). To illustrate this, compare Polish (12) and Japanese (13) below:

(11) Q: Did John leave before Mary arrived?

(12) Polish:
A: Jan wyjechał przed przyjazdem Marii, czyli dziś
Jan left before arrival Mary's that.is today
rano /który jest ustalony na jutro.
morning/which is scheduled for tomorrow
Lit: 'John left before Mary's arrival, that is, this morning/ which (=Mary's arrival) is scheduled for tomorrow.'
A': Jan wyjechał zanim Maria przyjechała, czyli dziś rano
Jan left before Maria arrived that-is today morning/
#co będzie miało miejsce jutro.
#which be.$_{FUT}$ had place tomorrow
Lit: 'John left before Mary arrived, that is, this morning/ which (=Mary's arrival) will take place tomorrow.'

(13) Japanese:
A: John-ga Mary-ga toochakusu-ru mae-ni
John-$_{NOM}$ Mary-$_{NOM}$ arrive $_{NPST}$ before-$_{LOC}$

syuppatsusi-ta to iu- koto-wa hontoo-da
depart -PAST C say fact-TOP true-COP
Lit:'It is true that John left before Mary arrived.'

A': ...Mary-wa asu toochakusu-ru koto-ni
Mary-TOP tomorrrow arrive -NPAST fact-DAT
nat-tei ru
become-PROG be-PRES
'(John left before Mary's arriving, and) Mary will arrive tomorrow.'
Lit: 'The fact that Mary will arrive tomorrow is becoming true.'

Answer A' in (13) shows that Japanese can incorporate the information about the future as the felicitous answer to the question about the past in (11). This is not the case in Polish A' in (12). Only A in (12) is felicitous as it involves a nominal. Therefore, Japanese type 'p-shiftability' (Sharvit 2013) is not accessible in Polish (see also Kaufmann & Miyachi 2011). Explaining the source of this phenomenon, Sharvit (2013) argues that 'p-shiftability' arises only if the expression under *before*-clauses is temporally null. In Japanese *before* clauses, non-past tense is used (Japanese past is quantificational), which in fact has null meaning. Hence it is p-shiftable. In Polish, it is the pronominal nature of tense that resists being temporally null, making this language non-p-shiftable. At the same time, Sharvit (2013) argues that pronominal tense in fact lacks presuppositions. This makes it compatible with the inherent irrealis nature of *before* clauses. The indicative mood with the pronominal tenses in such languages fits *before* well.

3 Support for the Account: Negation in *before* Clauses

Additional support for the postulated inherent difference between presuppositions of *before* and *after* clauses comes from the observation that *before* clauses, in contrast to *after* clauses, license so called *expletive*

or *evaluative negation* (Yoon 2010).[3] Consider examples from Korean (14), Turkish (15), and finally Polish (16), all showing that the use of this special negative marker is licensed in *before* clauses (14a, 15a, 16a) but not with *after* clauses (examples 14b-16b below).

(14) a. John-i [Mary-katochakha-(**cianh**) -ki ceney]
John-$_{NOM}$ Mary-$_{NOM}$arrive -$_{NEG}$- -KI before
cipey issessta. (Korean)
home was
'John was at home before Mary arrived.'

b. John-i [Mary-ka tochakha -(***cianh**) -n hwuey] cipey
John-$_{NOM}$ Mary-$_{NOM}$ arrive -(neg) -N after home
issessta.
was
'John was at home after Mary arrived.'

(15) a. John [Mary-nin gel -(**me**) -(yebil) -me -sin-den önce]
John Mary-$_{GEN}$come -(neg)-(can) -$_{NMLZ}$ -3sg- $_{ABL}$ before
git -ti. (Turkish)
go-$_{PAST}$
'John left before Mary (could) arrive(d).'

b. John [Mary gel -(***me**) -dik -ten sonra] git-ti.
John Mary come-(neg) -$_{NMLZ-ABL}$ after go-$_{PAST}$
'John left after Mary arrived.'

(16) a. Jan był w domu zanim Maria **(nie)** przyjechała.
Jan was at home before Maria (neg) arrived (Polish)
'John was at home before Mary arrived.

b. Jan był w domu po tym jak Maria **(*nie)** przyjechała.
Jan was at home after this how Mary (neg) arrived
Int: 'John was at home after Mary arrived.'

---

[3] Yoon (2009) provides arguments for semantic import of evaluative negation, therefore, contrasting it with the expletive negation, which is argued to be devoid of semantic contribution. For the purpose of the present paper, we are using these terms interchangeably, as discussing Yoon's proposal would take us too far afield.

The negation optionally used in examples (14a), (15a), and (16a) above usually appears with irrealis/ non-veridical/subjunctive contexts, and it has been argued to be generated in high Evaluative Mood projection (Cinque 1999, Abels 2005, Yoon 2010). [4] Cross-linguistically, subjunctive mood (or its equivalent), often licenses the presence of such special negation. See example (17) from Polish:

(17) Jan boi się że **-by** ktoś **nie** przyszedł.
Jan fears REFL that -SUBJ somebody neg came
'John fears that somebody may come.'

In contexts like (17), the negation strengthens the subjunctive mood by indicating the speaker's evaluation of the reported event as bad and non-desired (see also Speas 2004 or Villalta 2008). In *before*-contexts like (14)-(16), this 'optional' negation contributes to emphasizing the causal relation between closing down the situation expressed by the matrix sentence and the event in the embedded sentence. This is done by strengthening the context in temporal clause from non-veridical to anti-veridical/counterfactual. We argue that this is in fact very characteristic for *before* clauses, and that the optional negation only strengthens what is already available. Therefore (18a) and (18b) below may be near synonymous.

(18) a. Mozart died before he finished the Requiem.
b. Mozart would have finished the Requiem if he hadn't died.

Sentences (14a-16a) with the evaluative negation carry a counterfactual inference namely that *John wouldn't have left home if Mary hadn't*

[4] Notice that this special expletive negation is optional and its contribution to the meaning differs from being a logical operator reversing the truth value of the proposition. Its contribution is also not captured in the English translations of the data.

arrived.[5] In other words, all worlds in which John is at home, are those in which Mary's arrival hasn't happened yet. The intuition here is that the role of negation can be considered to be parallel with Iatridou's (2000) exclusion feature, ranging over times or worlds, similarly to the result of 'fake past' reading in subjunctive conditionals. Both indicate the presence of modality, as well.

(19) [[ExclF]] = $\lambda x_{\alpha}. \lambda y_{\alpha}. x \not\trianglelefteq y$ (Asarina 2006)

Supporting our proposal concerning the non-veridicality of *before*-clauses is the fact that irrealis mood (expressed for example by negation) in matrix clauses generally tends to license subjunctive mood in the complement of certain verbs. Consider Polish (20):

(20) a. Janowi wydaje się że -(***by**) ktoś przyszedł.
John.$_{DAT}$ seem $_{REFL}$ that (*-$_{SUBJ}$) somebody came
Int: 'It seems to John that somebody came.'
b. Janowi **nie** wydaje się że-**by** ktoś przyszedł.
Jan.$_{DAT}$ neg seems $_{REFL}$ that-$_{SUBJ}$ somebody came
'It doesn't seem to John that somebody came.'

Analogically to the *before*-clauses, here commitment to the truth, i.e. veridicality of the embedded predicate, is weakened.

Finally, some languages use negation as part of the *before* itself. Examples (20) below exemplify that in Inuktitut (Hayashi 2011):

(20) a. inngiqti-u-lauq-tug ilisaiji-u-lau **-nngit –tillugu.**
singer-be-$_{PST\text{-}Part.3s}$ teacher-be-$_{PST}$ -neg -conj.$_{3s}$
'He was a singer before (lit: while-not) he was a teacher.

[5] An anonymous reviewer correctly points out that the English sentence *John was at home before Mary arrived* does not lead to inference *John wouldn't have left home if Mary hadn't arrived.* We agree with this observation, which correlates with the fact that evaluative/expletive negation of Polish or Korean type is not available in English: *John was at home before Mary (*didn't) arrive.* At this moment, we have no plausible explanation as to the lack of availability of this negation in English and we will leave it for future research.

b. ullumi miali qai-qqau-juq jaan qai -qqau
today Mary come-H.PST-Part.3s John come-H.PST
-nngi -tillugu
-neg -conj.3s
'Today Mary came and John didn't come.'

Example (20a) shows the use of negation with the conjunction marker to express the equivalent of *before*, which as we are showing here, carries more meaning than just the direction of temporal precedence. (20b) shows that the same negative marker can be used to express a logical truth conditional negative operator. This supports a special, non-veridical status of *before* that stays in contrast to presuppositional, veridical status of *after*. We postulate that this indicates an inherent semantic difference between these two temporal expressions, which is difficult to capture in systems ignoring their presuppositions.

4 Extension: Geis-Ambiguities

Our proposal extends to the cross-linguistic variation in availability of so-called Geis-ambiguities (Geis 1970, 1985; Larson 1990, Haegeman 2010, 2012; Sharvit 2013). Example (21) is ambiguous between two possibilities for the time of Juan's arriving: either before Maria's thinking (high reading) or before Pedro's leaving (low reading).

(21) Juan arrived before Maria thought Peter would leave.
a. High reading: Juan arrived before Maria's moment of thinking
b. Low reading: Juan arrived before Peter's moment of leaving

Sharvit (2013) proposes that the only factor that plays a role in the availability of the low-interpretation is the relativization of the embedded clause. See Spanish (22a), where only the high reading is available, and (22b), where the embedded clause involves a relative clause and both readings are available ((22a) and (22b) based on Sharvit (2013:32)).

(22) a. Juan llegó antes de que María pensara que Pedro se
Juan arrived before of that Maria think.SUBJ that Pedro REFL
habia ido.
had left
'Juan arrived before Maria thought Pedro left'
Readings: High/*Low

b. Juan llego antes del momento en el que María
Juan arrived before of.the moment in the which Maria
penso que Pedro se habia ido
thought that Pedro REFL had left
'Juan arrived before Maria thought Pedro left'
Readings: High/Low

The Spanish examples above, however, do not constitute a minimal pair. We want to argue that the additional factor in availability of both high and low reading is the mood of the embedded clause. Namely, the low reading is blocked in irrealis mood. If this is the case, the lack of a low reading in (22a) is not surprising because it contains a subjunctive.

Consider a true minimal pair from Korean in (23), which shows that Sharvit's (2013) requirement constitutes the necessary requirement for the low reading's availability, but not the sufficient one. The low reading disappears when the non-factive relativizer *-l* (23b) is used instead of the factive relativizer *-n* (23a). Both sentences are predicted by Sharvit to give rise to both scopes, which is not the case.

(23) a. John-i [Mary-ka tochakhayssta-ko malha-**n** sikan
John-NOM Mary-NOM arrived-C say-N time
ceney] namwu-ey mwul-ul cwuessta.
before] tree-LOC water-ACC gave.
'John watered the plant before the time Mary said that she arrived.' Readings: High /Low

b. John-i [Mary-ka tochakhayssta-ko malha-**l** sikan ceney]
J-NOM M-NOM arrived-C say-L time before
namwu-ey mwul-ul cwuessta.
tree-LOC water-ACC gave
'John watered the plant before the time Mary would say that she arrived.' Readings: High/*Low

Similarly, in Polish, the low reading is attested both in *after* and *before* clauses (24a). We have shown independently that subjunctive/irrealis is not licensed in complements of *after* clauses, therefore Geis-ambiguities are predicted to be always available for *after*. This is not the case with *before* clauses, where the low reading disappears once the subjunctive mood is used (24b).

(24) a. Jan podlał kwiat przed/ po tym jak Maria
John watered flower before/after this how Maria
powiedziała, że przyjedzie.
said that arrive.$_{FUT}$
'John watered the flower before/after Mary said she would arrive.' Readings: High/Low

b. Jan podlał kwiat przed tym jak Maria powiedziała-**by**
Jan watered flower before this how Maria said-$_{SUBJ}$
że przyjedzie.
that arrive.$_{FUT}$
'John watered the flower before Mary could say that she would arrive.' Readings: High/*Low

The correct generalization then is that irrealis marking blocks the low reading. This will make a lot of sense once we consider the syntactic source of the low reading. It has been observed that the low reading in temporal adjunct clauses can only be obtained by movement of the temporal operator to the left periphery (Geis 1985; Larson 1990, Bhatt and Pancheva 2006; Tomaszewicz 2009, 2012; Haegeman 2010, 2012). This movement account is in fact supported by the disappearance of the low reading with intervening islands (Haegeman 2012: 202). Consider (25) where the low reading is absent when the embedded clause involves a Complex NP island:

(25) I saw Mary in New York, when she made the claim that she would leave.
a. High construal: 'I saw her at the time that she made that claim.
b. *Low construal: 'I saw her at the time of her departure.'

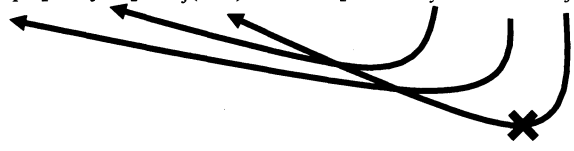
The moment the extraction out of the lower clause is blocked, the low reading is automatically blocked, as well. That shows the necessity of syntactic movement in Geis-ambiguities. One plausible explanation of the absence of the low reading in *before* clauses with counterfactuals is an intervention effect created by the presence of the world (or irrealis) operator that binds its variable in Cinque's $MoodP_{irrealis}$. This effect can be accounted for by a feature-based approach to locality such as in Starke

(2001), Rizzi (2004), or Haegeman (2012). According to these accounts, an element with some feature α blocks extraction of another element with the same feature.

In fact, Tomaszewicz (2012) shows that the Polish irrealis subjunctive particle *–by* has to move to C^0, whose specifier is occupied by the null world operator. This movement can be detected by obligatory placement of this particle in the second syntactic position in the clause (unlike whenever the world operator is not involved and the particle is free to occur anywhere lower in the structure), and by some intervention effects. These intervention effects arise in various Main Clause Phenomena (MCP), i.e. in other constructions involving A'-movement, such as contrastive topicalization (26) (based on Tomaszewicz 2012:268).

(26) a. Gdybyś mejla (*to) napisał (a nie list), on szybko
when.SUBJ email TOP wrote (and not letter), he quickly
by go przeczytał.
SUBJ it read
Int: 'If you wrote an email, and not a letter, he would read it quickly.'

b. $[_{CP}\ Op_i\ [_{C^0}$ by $[\ XP_j(*to)\ \ [_{TP}\ t_{by}\ \ t_i\ \ t_j\ ]]]]$



This confirms the role of mood in availability of Geis-ambiguities, which disappear in irrealis mood, licensed only in *before*-clauses. Since the syntactic presence of the world operator is detectable by various intervention facts, the inherent difference between the *before* and *after* clauses is reflected also in the syntax of these two temporal adjuncts.

5 Conclusions

We have argued for an inherent difference in the selectional properties of *before* and *after* clauses cross-linguistically, with *before* selecting for irrealis mood, but *after* selecting for realis mood. Based on this claim about the asymmetry in mood selection between these temporal adjuncts

we proposed a uniform analysis of the disparate morphology appearing in *before* clauses. This proposal assumes a crosslinguistic difference in the properties of tenses, or their presuppositionality, keeping the properties of *before* and *after* constant across languages.

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AGREE-dependent A-movement and Low Copy Pronunciation in Russian*

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1 Introduction

Among the different types of movement found across languages, we observe that they differ, among other things, in whether they are accompanied by agreement in φ-features (φ-AGREE). For example, A-movement as seen in passive, unaccusative, and raising constructions in many languages is accompanied by the realization of the φ-features of the moving element on the head that attracts it. On the other hand, other kinds of A-movement (e.g. A-scrambling) and Ā-movement (e.g. *wh*-movement) do not involve φ-AGREE. In this paper, we demonstrate that for certain types of movement, whether φ-AGREE is involved will have

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direct consequences for the pronunciation of movement copies. We contrast φ-AGREE-based movement in Russian A-chains with one type of non-φ-AGREE-based movement—in this case, the movement of certain oblique preverbal arguments. We demonstrate that in φ-AGREE-based movement, either the highest or lowest copy can be pronounced;[1] this has been referred to as "covert movement" if the lowest copy is the one pronounced. Further, we demonstrate that this option is not available for the other type of movement; instead, for non-φ-AGREE-based movement, only the higher copy can be pronounced.

Empirical support for this claim comes from variably case-marked internal arguments. In Russian, internal arguments may be structurally case-marked accusative (ACC) or nominative (NOM); they may also be case-marked genitive (GEN) under negation. This includes surface objects of transitives (1b), surface subjects of unaccusatives (2b), and surface subjects of passives (3b), but not subjects of transitives or unergatives (Peškovskij, 1956; Pesetsky, 1982).[2] Note that default agreement (third person singular neuter) appears when the sole argument of the verb is case-marked genitive under negation (2b,3b).

(1) a. Ja ne videl èti filmy.
I NEG saw$_{3SG.M}$ these$_{ACC}$ films$_{ACC}$
'I didn't see these movies.'
b. Ja ne videl ètix fil'mov.
I NEG saw$_{3SG.M}$ these$_{GEN}$ movies$_{GEN}$
'I didn't see these movies.'

(2) a. Otvet ne prišel.
answer$_{NOM}$ NEG came$_{3SG.M}$
'The answer didn't come.'
b. Otveta ne prišlo.
answer$_{GEN}$ NEG came$_{3SG.M}$
'An answer didn't come.'

[1] Our assumption throughout is that the Y-model may permit situations in which a syntactic object moves in the narrow syntax but is pronounced in its base position in accordance with the copy theory of movement (Chomsky, 1993).

[2] Although Babby (1980, 2001) documents a limited set of examples in which unergatives are also able to take the genitive of negation.

(3) a. Gazety ne byli polučeny.
newspapers$_{NOM}$ NEG were$_{PL}$ received$_{PL}$
'The newspapers were not received.'
b. Gazet ne bylo polučeno.
newspapers$_{GEN}$ NEG was$_{3SG.N}$ received$_{3SG.N}$
'The newspapers were not received.'

Importantly for us, the GEN argument in unaccusatives and passives may appear preverbally (4a,5a) or postverbally (4b,5b).

(4) a. **Gribov** zdes' ne rastët.
mushrooms$_{GEN}$ here NEG grow$_{3SG.N}$
'No mushrooms grow here.'
b. Zdes' ne rastët **gribov**.
here NEG grow$_{3SG.N}$ mushrooms$_{GEN}$
'No mushrooms grow here.'

(5) a. Segodnja **gazet** ne bylo polučeno.
today newspapers$_{GEN}$ NEG was$_{3SG.N}$ received$_{3SG.N}$
'No newspapers were received today.'
b. Segodnja ne bylo polučeno **gazet**.
today NEG was$_{3SG.N}$ received$_{3SG.N}$ newspapers$_{GEN}$
'No newspapers were received today.'

The structural position of the preverbal GEN argument (4a,5a) (and other oblique preverbal arguments) is a matter of some debate (Lavine & Freidin, 2002; Babyonyshev et al. 2001; Bailyn, 2004; Slioussar, 2011, inter alia); we return to this debate in Section 4.2. Instead, our focus here is on cases in which the sole argument is postverbal (4b,5b). We follow Pesetsky (1982) and Harves (2002), among many others, in taking the postverbal GEN (and NOM) arguments of unaccusatives and passives to be merged initially as sisters to the verb.[3] There is the theoretical possibility

[3] This is an important starting point, because there is an alternative analysis in which the NOM argument may right extrapose to a high position. That analysis could potentially account for the binding, scope, and control data without necessitating any of our conclusions. There is some agreement that postverbal transitive and unergative subjects are extraposed (Sekerina, 1997; Slioussar,

that these arguments undergo movement to some left-peripheral position even when they are pronounced postverbally; that is, low copy pronunciation. Potsdam and Polinsky (2011) demonstrate (contra Babyonyshev et al., 2001) that the postverbal GEN argument does not undergo syntactic movement in conjunction with low copy pronunciation (4b,5b). Here, we argue that when the *in situ* argument of the unaccusative or passive is NOM (6b), it *does* undergo movement, in conjunction with pronunciation of the lower copy.

(6) a. **Griby** zdes' ne rastut.
mushrooms$_{NOM}$ here NEG grow$_{3PL}$
'Mushrooms don't grow here.'
b. Zdes' ne rastut **griby**.
here NEG grow$_{3PL}$ mushrooms$_{NOM}$
'Mushrooms don't grow here.'

Evidence for this claim comes from binding, control, and scope diagnostics in φ-AGREE-based A-chains (passive and unaccusative). We use these diagnostics to demonstrate that (a) the postverbal NOM arguments occupy a high position in syntactic structure, even though they are pronounced low, and (b) postverbal GEN arguments do not occupy this high position. We attribute this to the observation that NOM arguments enter into a φ-AGREE relation with T, while GEN arguments do not. Our hypothesis is that movement chains predicated on a φ-AGREE relation in Russian permit pronunciation of a low copy; movement that is not predicated on φ-AGREE does not.[4]

2011), while arguments of unaccusatives are generated as internal arguments and are not extraposed (Polinsky et al., 2013; Slioussar, 2011). For evidence that the postverbal NOM arguments investigated here are not extraposed, see *web.stanford.edu/~bkrejci/KGH_FASL25_AppendixA.pdf.*

[4] One might expect that, in the case of nominative arguments, the argument will receive the same interpretation, whichever copy is pronounced; in fact, a reviewer points out that the two surface orders differ with respect to the definiteness of the nominative argument. We understand the difference to be a result of the discourse interpretive properties of the relevant arguments in their pronounced positions. How such interpretations arise is a large and important question, not addressable here. We suppose, however, that this information could either be read off of the surface structure or that there might be featural

2 Diagnostics for Low Copy Pronunciation in Movement

We consider three diagnostics which indicate that φ-AGREE-dependent movement can involve low copy pronunciation, while at least one other kind of non-φ-AGREE-based movement cannot. We contrast the behavior of two kinds of sole arguments of unaccusative and passive predicates in postverbal position: NOM arguments, which trigger verbal agreement, and GEN arguments, which do not. All of the diagnostics are predicated on the idea that syntactic height (in terms of c-command) is relevant for binding, control, and scope interpretation.[5]

2.1 Binding

One way to test whether an argument has moved to a higher structural position, despite being pronounced in its *in situ* position, is to determine whether it has the ability to bind an anaphor located high in the syntax. Arguments that do not have the option of movement in conjunction with low copy pronunciation should not be able to bind high anaphors.

Our hypothesis is that NOM arguments pronounced in their *in situ* position enter into a φ-AGREE relation with T and undergo movement to [Spec, TP]. We expect them to bind anaphors located high in the structure, even when they are pronounced low. In contrast, GEN arguments pronounced in their *in situ* position will not enter into a φ-AGREE relation, will not move, and will not be able to bind anaphors located high in the structure from their low position (Babyonyshev et al., 2001; Polinsky & Potsdam, 2013).

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specifications associated with the relevant arguments which partially drive the choice about which copy (low or high) to pronounce (as suggested in Stjepanović 1996).

[5] What is necessary for us is that the high position of the NOM argument be high enough to e.g. bind a high anaphor. This is true of NOM arguments of unaccusatives pronounced in preverbal position (i), which may bind an anaphor in a phrase adjoined to TP.

(i) Na svoëmjubilee sam imeninnik tak i ne pojavilsja.
at self's party EMPH birthday-boy so and NEG appeared$_{3SG.M}$
'The birthday boy never even appeared at his own party.'

We use the possessive anaphor *svoj* to test the binding possibilities of the NOM and GEN arguments. *Svoj* requires a clause-mate binder (7) (Rappaport, 1986; Bailyn, 2007) in [Spec, TP].

(7) a. Ivan$_i$ ljubit svoju$_i$ sobaku.
Ivan love$_{3SG}$ self$_{ACC}$ dog$_{ACC}$
'Ivan loves his dog.'

b. Vanja znaet, čto Volodja$_i$ ljubit svoju$_i$ sestru.
Vanja know$_{3SG}$ that Volodja love$_{3SG}$ self$_{ACC}$ sister$_{ACC}$
'Vanja$_y$ knows that Volodja$_i$ loves his$_{i/*y}$ sister.' (Rappaport, 1986)

Binding of *svoj* is crucially not limited to NOM arguments. DAT (and presumably other oblique) arguments may bind *svoj*, given the right configuration (Babyonyshev et al., 2001; Chvany, 1975, 67). This tells us that position, not just case, is relevant for binding *svoj*.

(8) Ivanu$_i$ bylo žal sebja$_i$ i svoju$_i$ sobaku.
Ivan$_{DAT}$ was$_{3SG.N}$ sorry.for self$_{ACC}$ and self$_{ACC}$ dog$_{ACC}$
'Ivan was sorry for himself and his dog.'

Looking first at unaccusatives, *in situ* NOM arguments (9a) can bind high anaphors. We take this as evidence that syntactic movement has taken place. In contrast, *in situ* GEN arguments (9b) cannot bind high anaphors. We take this as evidence that movement has not taken place.

(9) a. Na svoëm jubilee tak i ne pojavilsja sam
at self's anniversary so and NEG appeared$_{3SG.M}$ EMPH$_{NOM}$
imeninnik.
birthday-boy$_{NOM}$
'The birthday boy never even appeared at his own party.'
b. *Nasvoëm jubilee tak i ne pojavilos' samogo
at self's anniversary so and NEG appeared$_{3SG.N}$ EMPH$_{GEN}$
imeninnika.
birthday-boy$_{GEN}$

Analogously, for passives, *in situ* NOM arguments (10a) may bind anaphors in a high position, while *in situ* GEN arguments (10b) cannot.

We take this is indicating that syntactic movement has taken place in the first case, but not in the second.

(10) a. V svoej berloge ne byl najden ni odin medved'.
in self's lair NEG was$_{3SG.M}$found$_{3SG.M}$not one$_{NOM}$ bear$_{NOM}$
'Not one bear was found in his own lair.'
b.*V svoej berloge ne bylo najdeno ni odnogo medvedja.
in self's lair NEG was$_{3SG.N}$found$_{3SG.N}$ not one$_{GEN}$ bear$_{GEN}$

The evidence presented in this subsection shows that, for the purposes of anaphor binding, sole NOM arguments of passives and unaccusatives can act as if they have moved even in their *in situ* positions, while sole GEN arguments of passives and unaccusatives act as if they have not moved from their *in situ* positions.[6]

2.2 Control

Next, we use control as a diagnostic for determining whether an argument may appear high in the syntax despite being pronounced in its *in situ* position. If the relevant argument has moved to a high position, it should be able to control a structurally high PRO. Arguments that do not have the option of movement in conjunction with low copy pronunciation should not be able to control a high PRO.

Our hypothesis is that NOM arguments pronounced in their *in situ* positions undergo movement; therefore, we expect them to be able to control a PRO located high in the structure, even when they are

[6] One might wonder whether preverbal GEN arguments, having undergone movement to the left periphery, can do all the things that low GEN arguments (we claim) cannot—e.g., bind high anaphors. This is a question with a long history, originating in Bailyn's (1995) and King's (1995) early work on word order and discourse configurationality in Russian. As discussed in Section 4.2, our analysis is compatible with the idea that GEN internal arguments move to a preverbal position that is either a second specifier of TP or a specifier of a separate discourse-associated functional head; in either case it is an open question whether that landing site is an A-position. The same question goes for DAT experiencer arguments, especially if there is a second argument that is a NOM: whether we expect the NOM argument to scope over or under the DAT argument will depend on our ideas about where its landing site is with respect to the position of the DAT.

pronounced low. In contrast, GEN arguments pronounced in their *in situ* position will not enter into a φ-AGREE relation, will not move, and will not be able to control a PRO located high in the structure from their low position (Polinsky & Potsdam, 2013).

Crucially for us, NOM and (in spoken registers) DAT 'subjects' can control PRO (Pesetsky, 1982; Kozinskij, 1983; Moore & Perlmutter, 2000, *inter alia*), in this case in the gerundive. In (11a), a canonical NOM subject controls a high PRO, and in (11b) a dative experiencer argument controls a high PRO (Polinsky & Potsdam, 2013). This suggests that position, not just case, is relevant for control.[7]

(11) a. PRO_i načavšis' iz-za erundy, **ix** **ssory**$_i$ uže
PRO begun because-of nonsense their$_{NOM}$spats$_{NOM}$ already
ne prekraščalis'.
NEG stop$_{3PL}$
'Having started out of nothing, their quarrels would never stop.'

b. PRO_i putešestvuja, **vam**$_i$ udastsja uznat' mnogo
PRO traveling you$_{PL.DAT}$ manage$_{3SG.FUT}$ learn$_{INF}$ much
novogo.
new
'As you travel you will be able to learn many new things.'

For unaccusatives, *in situ* NOM arguments (12a) can control a high PRO. In contrast, *in situ* GEN arguments (12b) cannot control a high PRO. We take this as evidence that the NOM argument has moved high in the structure, despite *in situ* pronunciation, while the GEN argument has not moved higher than its *in situ* position.

(12) a. PRO_i načavšis' iz-za erundy, uže ne
PRO begun because-of nonsense already NEG

[7] A reviewer has pointed out that certain examples with dative controllers sound better than others; this seems in line with previous characterizations of such constructions as conversational in nature. It is clear, though, that dative arguments can be controllers in a variety of contexts; see (18). The reviewer has pointed out that the modal flavor of (11b) may be contributing to a higher level of acceptability. We leave further investigation of why this might be to future work.

prekraščalis' **ix** **ssory**$_i$.
stop$_{3.PL}$ their$_{NOM}$ quarrels$_{NOM}$
'Having started out of nothing, their quarrels would never stop.'

b.*PRO$_i$ načavšis' iz-za erundy, uže ne
PRO begun because-of nonsense already NEG
prekraščalos' **ix** **ssor**$_i$.
stop$_{3SG.N}$ their$_{GEN}$ quarrels$_{GEN}$

Similarly, for passives, *in situ* NOM arguments (13a) can control a high PRO, while *in situ* GEN arguments (13b) cannot. We take this to indicate that the nominative arguments have moved to a higher position, whereas the genitive arguments have not.

(13) a. PRO$_i$ popavšis' na spisyvanii, ne byl dopuščen k
PRO caught on cheating NEG were$_{3PL}$ permitted$_{3PL}$ to
začëtu **ni odin provinivšijsja student**$_i$.
test not one$_{NOM}$ guilty$_{NOM}$ student$_{NOM}$
'Having been caught cheating, not a single guilty student was permitted to take the test.'

b.*PRO$_i$ popavšis' na spisyvanii, ne bylo dopuščeno
PRO caught on cheating NEG was$_{3SG.N}$ permitted$_{3SG.N}$
k začëtu **ni odnogo provinivšegosja studenta**$_i$.
to test not one$_{GEN}$ guilty student$_{GEN}$

This evidence tells us that, for the purposes of control of a highly positioned PRO, sole NOM arguments of passives and unaccusatives can act as if they have moved even in their *in situ* positions; in contrast, sole GEN arguments of passives and unaccusatives act as if they have not moved to a higher syntactic position from their *in situ* positions.

2.3 Scope

For our final diagnostic, we examine the scope-taking possibilities of the relevant arguments. An *in situ* argument that has moved high in the narrow syntax should have expanded scope possibilities, while an *in situ* argument that has not moved should exhibit a more limited range of scopal interpretations. We expect a quantified NOM argument to move to a high position and be able to scope over negation from its high position

or under negation from its low position. In contrast, we expect a GEN argument to scope under negation only.[8]

First, it is important to show that a canonical preverbal NOM subject can scope above or below negation (14). We expect that nominative arguments of unaccusatives and passives, because they are also in a high syntactic position, will also have both scope possibilities.

(14) Vse ne prišli.
all NEG come$_{3PL}$
'Everyone didn't come.' ALL >> NEG
'Not everyone came.' NEG >> ALL

As expected, *in situ* nominative arguments of unaccusative verbs do take both scopes (15a). *In situ* genitive arguments, on the other hand, take only narrow scope (15b).[9] Similar judgments are reported in Potsdam & Polinsky (2011) and Polinsky & Potsdam (2013).

(15) a. V čemodan ne pomestilis' vse neobxodmye dlja menja
in suitcase NEG fit$_{3PL}$ all$_{NOM}$ necessary$_{NOM}$ to me
jubki.
skirts$_{NOM}$
'All the skirts necessary to me did not fit into the suitcase.'
'Not all the skirts necessary to me fit into the suitcase.'

[8] Scope judgments for (14)-(16) were collected by asking speakers if the relevant sentences were compatible with particular contexts, e.g. *There were five skirts and only four fit in the suitcase*; or *There were five skirts and all five did not fit in the suitcase.*

[9] Slioussar (2011) finds that the NOM argument in examples like (15a) can take only narrow scope, in contrast to the postverbal NOM argument of an unergative predicate, which she shows may take wide or narrow scope. She takes this as evidence that internal nominative arguments do not raise to [Spec,TP]; on our analysis, however, internal NOM arguments must have the option of moving to a higher position even when they are pronounced *in situ*. The judgments we collected support this prediction.

b. V magazine ne okazalos' vsex neobxodimyx dlja menja
at store NEG appeared$_{3SG.N}$ all$_{GEN}$ necessary$_{GEN}$ for me
produktov.
groceries$_{GEN}$
#'At the store all the groceries I needed turned out not to be there.'
'At the store not all the groceries I needed turned out to be there.'

With passives, *in situ* NOM arguments (16a) take both scopes, as expected if syntactic movement has taken place. *In situ* GEN arguments (16b), however, are unfortunately not possible when the genitive is a quantifier. This means we cannot formulate the right kind of example to test the scope possibilities.

(16) a. Na ètom kompjutere ne byli najdeny vse fajly.
on this computer NEG were$_{PL}$ found$_{3PL}$ all$_{NOM}$ files$_{NOM}$
'All the files were not found on this computer.'
'Not all the files were found on this computer.'
b. ?/* Na ètom kompjutere ne bylo najdeno vsex fajlov.
on this computer NEG was$_{3SG.N}$ found$_{3SG.N}$ all$_{GEN}$ files$_{GEN}$

Taken together, the evidence presented here shows that sole NOM arguments of passives and unaccusatives can take wide scope; that is, they act as if they have moved even when pronounced in their *in situ* positions. In contrast, sole GEN arguments of unaccusatives cannot take wide scope, which suggests that they have not moved to a higher syntactic position.

3 Comparison with *In Situ* Datives

In this section we compare the behavior of *in situ* NOM and GEN internal arguments to the behavior of *in situ* datives. This comparison is called for because the difference between GEN of negation and NOM may be one of size rather than of height. For example, Pereltsvaig (2006) found that certain quantified noun phrases (e.g. *pjat' devoček* 'five girls'), when they do not trigger agreement (3SG.N), also cannot bind anaphors, co-

refer with PRO, or take wide scope, even when they are preverbal subjects.[10]

This is relevant for us because the GEN assigned under negation could also be structurally different from NOM nominals (along the lines of Pesetsky 1982 and its descendants)—with corresponding non-referential semantics. On this alternative account, regardless of whether GEN arguments move, they cannot bind, control PRO, or take wide scope for entirely independent reasons. The evidence in Section 2 still points to movement for postverbal NOM arguments of unaccusatives, but the contrast with GEN arguments is potentially lost.

One solution to this issue involves dative direct objects. Our φ-AGREE account predicts that any non-NOM postverbal argument will behave just like the GEN arguments of unaccusatives under negation, including DAT direct objects of transitive verbs. First, it is important to show that morphological DAT case does not prevent binding by a DAT argument (Babyonyshev et al., 2001; Chvany, 1975, 67) (8), wide scope of a DAT argument over negation (17), or control by a DAT argument (Pesetsky, 1982; Kozinskij, 1983; Moore & Perlmutter, 2000) (11b), as long as the argument is high enough in the structure. This suggests that structural position, not just case, is relevant for these diagnostics.

(17) Vsem devočkam ne nravitsja èta kniga.
all$_{DAT}$ girls$_{DAT}$ NEG please$_{3SG.F}$ this$_{NOM}$ book$_{NOM}$
'All the girls don't like this book.' ALL≫NEG
?'Not all the girls like this book.' NEG≫ALL

DAT direct objects can also control a lower PRO (18).

(18) On pomog devočke$_i$ [PRO$_i$ najti sobaku].
he$_{NOM}$ helped$_{3SG.M}$ girl$_{DAT}$ PRO find$_{INF}$ dog$_{ACC}$
'He helped the girl find the dog.'

[10] In addition, genitive arguments are said to be "property-denoting expressions that lack existential commitment" (Kagan, 2013); a difference in semantic type may contribute to the contrasting behavior of nominative and genitive arguments presented in Section 2.

These two facts suggest that DAT direct objects are an appropriate test case; we can compare their behavior with respect to binding, control, and scope with that of the nominative and genitive internal arguments of unaccusatives and passives.

In fact, DAT direct objects follow the expected pattern: they cannot control a high PRO (19a), take wide scope (19b), or bind a high anaphor (19c) from a VP-internal position.

(19) a. $PRO_{*i/y}$ possorivšis iz-za erundy, $Vasja_y$ ne
PRO having-argued because.of nonsense $Vasja_{NOM}$ NEG
zavidoval devočkam$_i$.
$envy_{3SG.M}$ $girls_{DAT}$
'Having argued because of nonsense, Vasja didn't envy the girls.'

b. Učitel'nica ne verit vsem učenikam.
$teacher_{NOM}$ NEG $believe_{3SG}$ all_{DAT} $students_{DAT}$
'For all of the students, the teacher does not believe them.'
'The teacher believes not all of the students.'

c. *Na svoëm jubilee samomu imeninniku nikto ne
at self's anniversary $EMPH_{DAT}$ $birthday\text{-}boy_{DAT}$ $no\text{-}one_{NOM}$NEG
pomogal.
$helped_{3SG.M}$

This is predicted by our hypothesis that any non-NOM postverbal argument should not be able to move to a high position while being pronounced in its *in situ* position.

At the start of this section, we raised the question: is the oblique argument's inability to bind, control, and take wide scope a fact about syntactic height or about its internal structure (its case or size)? It is difficult to tell in the case of GEN arguments of unaccusatives under negation, but data from direct object DAT arguments demonstrates that the generalization is about syntactic height, not internal structure (case or size). Movement in conjunction with low copy pronunciation is not a possibility for arguments that do not agree (i.e. non-NOM arguments).

4 Analysis

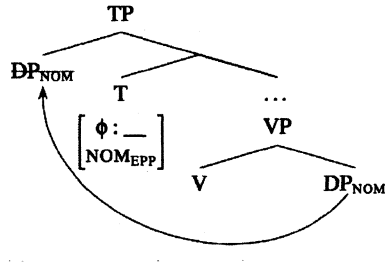
Our analysis attempts to account for the observation that NOM *in situ* arguments always enter into an AGREE relation and may move, though

there is an option to pronounce the lower copy in the chain; and, if the GEN argument remains *in situ*, it has not moved (i.e. there is no option of movement and low copy pronunciation).

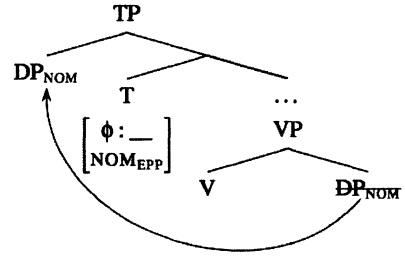
We take on a number of assumptions. We assume that the relevant type of GEN case is assigned first, although we leave underspecified the mechanism by which this takes place. Then, finite T looks for a DP in its c-command domain to agree with. We assume that only caseless DPs are visible to the search procedure, and the probe agrees with the highest eligible goal. If T agrees successfully, it gets the φ-feature values of the DP and assigns its case feature to the DP. If T cannot agree (e.g. because there are no visible DPs in its c-command domain), it gets the default φ-feature values (per Preminger, 2014), in this case third person singular neuter. The EPP subfeature forces syntactic movement (and is not a phonological requirement).[11]

(20) Nominatives (unaccusatives, passives)

a. *In situ* nominatives



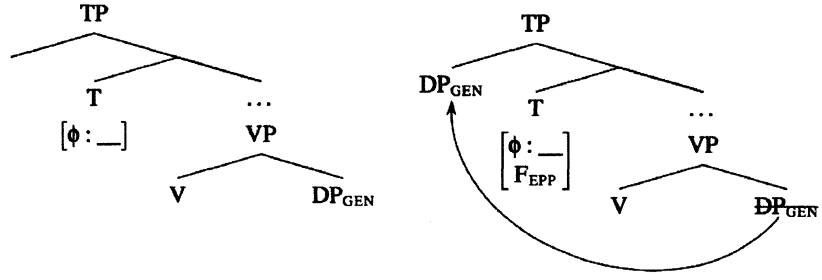
b. *Ex situ* nominatives



(21) Genitives (unaccusatives, passives)

a. *In situ* genitives of negation b. *Ex situ* genitives of negation

[11] We have shown that NOM internal arguments *may* move to [Spec, TP]; one may ask whether they *must* do so. We assume for concreteness here that the movement is an obligatory one, but leave open the possibility of the other option as well.



For NOM arguments, T [φ: _; NOM_{EPP}] probes for an appropriate nominal with which to agree and to which it can assign case. It finds the sole argument of a passive or unaccusative if that argument has not been assigned GEN under negation. The features on T force both agreement and movement, capturing the effects documented in Section 2. According to our hypothesis, the φ-AGREE relation facilitates pronunciation of either the low (20a) or the high (20b) copy of the nominal. For GEN arguments, T [φ: _] probes for an appropriate nominal with which to agree, but finds nothing—the argument bearing GEN of negation is not an appropriate target for φ-agreement. Default agreement results. Movement does not take place, capturing the effects documented in Section 2 (21a). If T also has a feature associated with it that has an EPP subfeature (F_{EPP}), the GEN argument will move (21b). Because this movement is not predicated on φ-AGREE, there will not be an option to pronounce the low copy in such configurations.

4.1 Why Does φ-AGREE Facilitate Low Copy Pronunciation?

The proposal developed thus far raises the important question of why low copy pronunciation should be facilitated by the establishing of a φ-AGREE relation (in addition to movement triggered by the EPP). The direction of this approach contrasts with an existing account (Nunes 2004), in which the choice of which copy to pronounce is determined by the number of formal features that each copy carries. Because PF will have to delete any formal features that it cannot interpret, it is more economical to pronounce the copy with the smallest number of uninterpretable features. Under normal circumstances, this will be the highest copy. The question of what Nunes (2004) predicts for our case study depends largely on the mechanism one chooses for the assignment of case. If we adopt his account of case assignment, case is an

uninterpretable feature, and the lower copy of a nominative argument will not have its case features checked, whereas the higher copy will. Under these circumstances, the prediction is that the higher copy must be pronounced, counter to the facts laid out here.

As an alternative way of explaining low copy pronunciation, we propose that Russian has a requirement that, when movement takes place, the syntactic dependency between the probe and the goal must be expressed at PF overtly. Specifically, if a phrase XP satisfies the EPP feature associated with a head Y, then either XP is pronounced in [Spec, YP] or there is a phonetic realization of a φ-AGREE relation between Y and XP. Because NOM arguments trigger verbal agreement, the second condition is satisfied and any of the copies may be pronounced; because GEN arguments do not trigger verbal agreement, the only way to satisfy the requirement is for the highest copy to be pronounced.

4.2 Preverbal Non-nominatives in Russian

Our analysis connects to a larger debate about word orders in Russian in which the preverbal argument is not a nominative. This includes unaccusative constructions in which an argument bearing genitive of negation appears in first position (4a); OVS word order in (22b), where the accusative object appears in first position; the adversity impersonal construction, in which an accusative or instrumental argument appears in first position (23); and raising constructions, in which any argument can precede the matrix verb (24).

(22) a. **Ivan** čitaet ètu knigu.
Ivan$_{NOM}$ reads this book$_{ACC}$
'Ivan reads this book.'
b. **Ètu knigu** čitaet Ivan.
this book$_{ACC}$ reads Ivan$_{NOM}$
'Ivan reads this book.'

(23) a. **Soldata** ranilo pulej.
soldier$_{ACC}$ wounded$_{3SG.N}$ bullet$_{INSTR}$
'A soldier was wounded by a bullet.'
b. **Pulej** ranilo soldata.
bullet$_{INSTR}$ wounded$_{3SG.N}$ soldier$_{ACC}$
'A soldier was wounded by a bullet.'

(24) a. **Yaša** možet stroit' dom.
Yaša$_{NOM}$ can$_{3SG}$ build$_{INF}$ house$_{ACC}$
'Yasha can build the house.'
b. **Livnem** možet zatopit' kvartiry.
rain$_{INSTR}$ could$_{3SG}$ flood$_{INF}$ apartments$_{ACC}$
'Rain could flood the apartments.'
c. **Kvartiry** možet zatopit' livnem.
apartments$_{ACC}$ could$_{3SG}$ flood$_{INF}$ rain$_{INSTR}$
'The apartments could flood from the rain.'

There are two major hypotheses about the data above. The first is that there is a designated A-position [Spec,TP] that hosts a diverse array of arguments (Bailyn, 2004; Lavine & Freidin, 2002). Under this hypothesis, the bold arguments in (22) through (24) are in [Spec, TP]. The second is that only arguments that have agreed with T land in this A-position, with all others landing in a designated Ā-position (Baker, 2008; Citko & Germain 2016; Slioussar, 2011). Under this hypothesis, only the bold arguments in (22a) and (24a) are in [Spec, TP]; the others are in another position.

There are two ways of understanding these hypotheses in light of our findings. One possibility is that the second hypothesis is correct; only NOM arguments, agreeing with finite T, are attracted via EPP to the [Spec, TP] position. Other arguments (e.g. preverbal GEN) do not enter into a φ-AGREE relation with T and are attracted to the left periphery by EPP on some other functional head.

Alternatively, the first hypothesis can be maintained if we allow for the possibility of multiple specifiers of T; in a transitive clause with a NOM and a GEN argument, the first specifier hosts the NOM argument and the second hosts the GEN argument. The NOM argument has the option of being pronounced low. Neither of these hypotheses makes any claims about the A- or Ā-status of the landing site. What they have in common is that if there is a nominative argument, it will be in [Spec, TP].

5 Conclusions and Consequences

In this paper, we have contrasted the behavior of NOM arguments of unaccusative and passive verbs with that of corresponding oblique arguments. Using diagnostics from binding, control, and scope, we have

demonstrated that such NOM arguments move to a high structural position even when pronounced *in situ*, but that oblique arguments do not. We attribute this contrast to a distinction between movement predicated on a φ-AGREE relation and movement that is not φ-AGREE-based. We have proposed that Russian has a requirement that, when movement takes place, the syntactic dependency between the probe and the goal be expressed at PF overtly. This requirement is met when the highest copy in a movement chain is pronounced or when an overt exponent of φ-AGREE is realized. The effect of the requirement is that low copy pronunciation is permitted for agreeing (NOM) arguments, but not for non-agreeing (non-NOM) arguments.

If our proposal is correct, we may wonder to what extent this is a Russian-specific pattern. Do we expect to find evidence of low copy pronunciation in e.g. A-scrambling in other languages? For example, Stjepanović (1996) argues that, in Serbo-Croatian, both structurally case-marked direct objects and inherently case-marked direct objects raise to [Spec, AgrOP], the position responsible for object-shift, despite being pronounced postverbally. Seen in light of our proposal, Stjepanović's findings may indicate that low copy pronunciation is possible for all Serbo-Croatian objects, meaning that low-copy pronunciation in Serbo-Croatian is not limited to NOM (agreeing) arguments, contrary to our findings for Russian. In the short term, the contrast between Russian and Serbo-Croatian may suggest that the PF requirement that movement have an overt exponent may be language specific; in the longer term, further investigation of such patterns in the Slavic languages and more broadly will be required in order to shed light on such contrasts, to the extent they are found.

Finally, our proposal makes a prediction about Ā-movement in Russian. Because Ā-movement is not predicated on a φ-AGREE relation, we do not expect low copy pronunciation to be permitted in Ā-movement. This means we do not expect to find evidence of covert Ā-scrambling or covert *wh*-movement in Russian. What kinds of predictions our proposal makes for Ā-movement in other languages is an open question, one that is largely dependent on whether the restriction on low copy pronunciation is specific to Russian. If Ā-movement is governed by the same principles as A-movement, and if a language shares Russian's restriction on low copy pronunciation, then we predict

the language should have covert *wh*-movement only in case it also has *wh*-agreement, all other things being equal.

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When Near Snakes Move Sideward!*

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1 Introduction

Given the distributional similarities between the anaphor binding and NP-movement, it is unsurprising (though not uncontroversial) that the two have been argued to involve the same syntactic relation. One possibility to unify the two is given in Hornstein (2001, 2006), where the locality conditions of Principle A reduce to the locality conditions on movement and the interpretative properties of the dependency between the reflexive and its antecedent are derived syntactically. Adopting and adapting Hornstein's account, Marelj (2007, 2010) shows that the movement analysis captures the data in Serbo-Croatian (SC). If reflexivization is movement, it follows that *sebe* (elided in the second conjunct in (1a)) is the reflex of the movement of *Tristram* and the only available reading is predicted to be the sloppy one. This prediction is borne out. Under a movement approach, the elimination of Principle A leads to the elimination of Principle B, on empirical grounds: bound pronouns and reflexives are in complementary distribution (1b).[1]

* I am grateful to the audience and the anonymous reviewers of *FASL 25* for their valuable input. Any errors that remain are my sole responsibility.

[1] Issues like the "accidental" co-referential reading for (1b), noted and elaborated upon by Reinhart (1983) and discussed in many a work since, are not relevant for our discussion.

(1) a. Lorens mrzi **sebe**, a i Tristram takodje.
Lorens hate oneself and Tristram too
'Laurence hates **himself** and Tristram does too.'
b. Lorens$_i$ kažnjava **sebe/*njega$_i$**
Lorens punish oneself/him
'Laurence$_i$ punishes **himself/*him$_i$**'

Movement derivation is not restricted to monoclausal environments (1b). Marelj (2010) gives evidence of movement in small clause environment, infinitives, and subjunctive *da*-complements of S-verbs of Progovac (Progovac 1994). In those instances, where Movement is barred, as for instance, in the cases of extraction from the relative clause (2a) & (2b) – sentential adjuncts, the Pronoun Insertion Strategy takes place and *njega* (2c) and *him* arise:

(2) a. *Koji egzotični jezik je Lorens zaposlio mladu sekretaricu [koja govori___]?
which exotic language AUX Lorens employed young secretary [who speaks___]
b. *Which exotic language did Laurence hire a young secretary [who speaks____]?
c. Luka je zaljubljen u devojčicu koja **njega$_i$/sebe$_i$** hvali].
Luka AUX enamoured in girl who him/onself praise
'Luka is enamored with the girl [who praises **him/*himself].**'

Since movement is standardly argued to be barred out of adjuncts in general (3) (sentential and non-sentential ones alike), the Pronoun Insertion Strategy is expected in cases of locative PP-adjuncts as well. English data (4) seem to corroborate exactly that. Standardly, *himself* in (4) is treated as a logophor in the sense of Reinhart and Reuland (see Reinhart and Reuland 1991, 1993). Unlike reflexives, logophors are permitted in environments where there is no local antecedent (4b). As reflexivization is restricted to co-arguments of a predicate, under a predicate-based account, the non-complementarity between *himself* and *him* is also expected. Under a movement account, logophors are not the result of movement and derivations in which they occur are not in

competition with the Pronoun Insertion Strategy. Again, it follows that logophors are not in complementary distribution with pronouns.[2]

(3) a. *Who did you see the snake [PP near ~~who~~]?
b. *Pored čije je on video zmiju [PP ~~pored čije~~ noge]?
next.to whose AUX he $see_{PRT.M.SG}$ snake leg

(4) a. John saw a snake [PP near himself/him].
b. Max boasted that the queen invited Mary and him/himself for tea.

Whereas SC (3b) suggests that the same kind of analysis should naturally extend to SC, the SC counterpart of (4a) challenges this kind of unity, under either a predicate-based or a movement theory. Namely, in (5), *njega* can only be referential and *sebe* is clearly a local reflexive (5).

(5) $Jovan_i$ je video zmiju pored **sebe/*$njega_i$**.
John AUX $see_{PRT.M.SG}$ snake near oneself/him
'Jovan saw a snake near himself.'

The goal of this paper is to understand the (seemingly) misbehaving pieces of data like (5), which, as we will shortly see are not a quirk of SC and the proper account of which requires serious probing into the notions of adjuncthood, multiple workspace, and derivational complexity.

The paper is organized as follows. Section 2 elaborates on the issues that the - seemingly isolated and quirky - piece of data in (5) raises. In Section 3, I discuss the technical machinery necessary to tackle the relevant data. The section also discusses the conceptual underpinning of the analysis I propose here. Section 4 provides a deeper insight into the issues of derivational complexity in cases of multiple workspaces. Finally, Section 5 concludes the paper.

[2] SC is a non-P stranding language but it allows the so-called extraordinary LBE (see Bošković 2005 and Talić 2014 and references there for a discussion, elaboration, and evidence that extraordinary LBE is truly movement).

2 When Near Snakes.....

Before we move to the analysis of the PP-adjuncts here, let us carefully unpack and describe in more detail the kind of puzzlement it raises.

The behavior of the data like (2) are well-know and expected under the standard assumption that extraction out of sentential adjuncts – tensed clauses is barred and is consistent with either the movement or the predicate based approaches to binding. As further noted above, the judgments attributed to the cases like (4a) in English put the locative PP-adjuncts on a par with the sentential ones in their behavior. Both predicate-based and movement based accounts treat the instances like *himself* in such cases as logophors in the sense of Reinhart and Reuland (1991, 1993). As well-known, the distribution of logophors is quite different that the distribution of anaphors. Unlike reflexives, logophors are permitted in environments where there is no local antecedent (6a) – modelled on R&R's examples and even no antecedent whatsoever (6b) – modelled on Ross 1967.

(6) a. Max boasted that the queen invited Sue and **him/himself** for tea.
b. I told my husband that programmers like **himself** are godsend!
c. Mary confirmed that this poem was written by **Luka and herself**.

Under a movement account, logophors are not the result of movement and derivations in which they occur are not in competition with the Pronoun Insertion Strategy. Again, it follows that logophors are not in complementary distribution with pronouns. What remains to be explained, of course, is why the optionality here is allowed and how it should be accounted for, but the rationale for either the predicate-based or movement-based approaches to treat the morphological self-element as a NON-anaphor seems solid.

It should be clear how the parallel SC data (5), where *njega* can only be referential and *sebe* is clearly a local bound, challenge both the predicate-based and movement theories. Importantly, now, the challenge is neither restricted to SC, nor is it easy to dismiss it as a minor quirk of binding. SC data seem to challenge the uniform treatment of locative and sentential adjuncts to start with! Allow me to explain. The first puzzling fact about SC data is that logophors are not permitted to occur within the

locative PP-adjunct to start with! Namely, as the data in (7) - counterparts of the English sentences in (6) - clearly show there is *sebe* can never be used logophorically to start with!

(7) a. Max_i je rekao da je $Kraljica_j$ pozvala Mariju i $njega_i/sebe_{j/*i}$ na čaj.
Max AUX $say_{PRT.M.SG}$ that AUX Queen invited Mary and him/oneself for tea
'Max said that the $Queen_j$ invited Mary and $him/herself_j$ for tea.'
b. Rekla sam svom suprugu da su programeri poput njega/*sebe čisto blaženstvo.
pro $tell_{PRT.F.SG}$ AUX one's husband that AUX programmers like him/oneself pure divinity
c. Marija je potvrdila da je pesma napisana od strane Luke i nje/sebe.
Mary AUX confirm that AUX song written by Luka and her/oneself

The behavior of the SC data is hardly exceptional. For instance, German (8a) patterns with SC (5) and (8b) patterns with SC (7a). Quite like in SC, *sich* present in the locative *neben*-PP in (8a) is not a logophor, but an anaphor!

(8) a. $Hans_i$ zah eine Schlange [neben **sich/*ihm$_i$**].
Hans saw a snake near one/him
'Hans saw a snake near himself.'
b. Max sagte, dass die Königin Maria und ihn/*sich zu Tee eingelande habe.
Max said that the Queen Mary and him/*one for tea invited has
'Max_i said that the Queen invited Mary and him_i for tea.'

Other languages that pattern with SC and German in this respect include Latin, Hindi and Hungarian.

That the treatment of the relevant pronouns as logophor in cases that involve locative PP-adjuncts is crosslinguistically problematic is further underscored by the relevant data from Dutch. The Dutch data in (9), though more complicated due to the availability of the simplex anaphor

ZICH, nonetheless clearly point towards the fact that the environment here is not an environment that allows a logophor to start with! Unlike English, for instance, where there is no morphological difference between the ananaphor and the logophor, Dutch has the designated logophor with *hemzelf/haarzelf* morphologically distinct from the anaphor *zichzelf*.

(9) a. Tristram/Marie zei dat dit boek geschreven is [door Sue en **hemzelf/haarzelf/*zichzelf**].
Tristram/Mary said that dit book written is [by Sue and $SELF_{\text{-logophor-M}}$/$SELF_{\text{-logophor-F}}$/$SELF_{\text{-anaphor M/F}}$]

b. Iedereen zag een slang naast **[zichzelf/*haarzelf/*hemzelf].**
Everyone saw a snake near $SELF_{\text{logophor-M}}$/$SELF_{\text{logophor F}}$ /$SELF_{\text{anaphor M/F}}$]

So, rather than SC being exceptional, it is English that might look like as the "odd man out" now. I would like to challenge this conclusion as well. Namely, it is important to stress that even the status (and consequently) the analysis of the familiar English data (4a) doesn't seem to be straightforward.

Firstly, the conclusion that *himself* in (4b) is a logophor does not seem straightforward. Allow me to explain. How do we know any instance of a X*self* in English is a logophor and not an anaphor? Since they are morphologically identical, the decision must rest upon their distribution. Canonically, logophors are not locally bound, as in (6a). Sometimes, there is not even an antecedent for them to start with (6b). But what is the deciding criterion for classifying himself in (4b) as a logophor? The conclusion is based on the assumptions about the semantic and syntactic status of the locative PP in question. Semantically, the PP is not a complement of the main predicate, but an element that is outside of the local binding environment of the main predicate. Syntactically, it is an adjunct – a piece of structure out of which the movement is barred. So far so good. Note, however, that even if one accepts that the syntactic/ semantic characterization of this piece of structure is correct, it is not obvious that (4a) is not a case of accidental coreference (pragmatically determined), on a par with the more familiar examples like (10a) below, where *he/Laurence* and *his* could also accidentally pick out the same referent from the universe of discourse.

As such, examples like (10a) contrast with those like (10b) where the construal between *everyone* and *his* must be that of bound reference, simply because *everyone* is not referential.

(10) a. **He/Laurence** loves **his** mother.
b. **Everyone/every boy** loves **his** mother.

Note, importantly, now the English data like (11) where *himself* seem to behave like an anaphor, rather than a logophor, minimally casts doubt on the validity of the standard account of (4a) in English.[3]

(11) [Everyone] $_i$ **[Every boy]**$_i$ saw a snake [near **himself/him**$_{j/*i}$**]**

For the native speakers I interviewed, (11) in English aligns with SC and German and Dutch examples above. If English is no longer an "odd man out" then we are allowed, at least, to entertain a uniform analysis of SC and English as a possibility. Such a claim, however, leads us to an even more intriguing issue. Clearly, the *near*-PPs under the consideration here are not complements of the relevant matrix verbs, in either SC or in English, in that that they receive the thematic role from the verbs in question. This, on the other hand, leads us directly to examine the notions such a argumenthood and adjuncthood, both syntactically and semantically. Namely, under a predicate-based accounts to binding of how they qualify as a binding domain. Under a movement approach to binding it follows then that not all of what we refer to as "adjuncts" are syntactically equal in that that whereas some disallow movement from them to take place, others do not.

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[3] I intentionally stay away from any kind of final conclusions about the lack of validity of the standardly reported judgments/analysis of the English examples in (4a) simply because I must leave the option that there exists a speaker variation here. The number and spread of my informants was not such that one could draw firm conclusions, but they are significant enough to raise doubt and open the possibility to reexamine the validity of the analysis of the English data like (4). Even stronger, it is not even obvious that one can ever use a logophor in the locative PP headed by *near* (i)!

(i) Mary claimed that the king saw/planted his pet snake **[near her/*herself]**

3 Move Sideward!

3.1 Conceptually & Semantically.....

Typically, when we think about adjuncts we tend to identify them in opposition to arguments/complements, in both semantic and syntactic terms. On the one hand, adjuncts differ from argument since they get their interpretation in a sentence by means other than via the association with a thematic role. Syntactically, unlike complements, adjuncts are typically the environments out of which the movement/extraction is barred.

What we often disregard in such deliberations, though it is implicit in them, is that there is also a common denominator that these notions share. And what they share is that that none of them are absolute terms. Allow me to explain. Take a look at the examples in (12).

(12) a. Tristram put the book [$_{\text{ARGUMENT}}$ **on the table**].
b. Tristram wrote the book [[$_{\text{ADJUNCT}}$ **on the table**].

What the examples in (12) illustrate is that the same piece of structure like a PP *on the table* can either be an adjunct or an argument and that crucially, its status as an adjunct or an argument is dependent on some other element. Simply put, the notion "adjunct" doesn't exist on its own; something is an adjunct only with respect to something else. And this intuition is perfectly consistent with our more formal tools like "predicates", "thematic roles" etc. that allow us to explain how one and the same piece of structure can empirically be either an "adjunct" or an "arguments" in semantic terms.

3.2 Syntactically & Technically....

The question that now arises is whether there are also empirical cases that show that an adjunct is a relational, rather than an absolute notion in syntactic terms. Here, I will focus on the notion of "extraction", as the syntactically crucial to the notion of "adjuncthood". If "adjunct" is not an absolute term, then we could also expect that there are empirical instances where the material extracted/accessed comes from within an "adjunct". There are two instances argued for in the literature to constitute empirical instantiation of "extraction" out of adjuncts;

Parasitic Gaps (Nunes (1995, 2001, 2004) as in (13a) and Adjunct Control cases (Hornstein 2001 et seq.) as in (14a).

The technical "tool" they use to account for (13a) and (14a) is known under the label Sideward Movement (see Nunes 1995 et seq. and also Bobaljik and Brown 1997, Uriagareka 1998, Hornstein 2001 for references and discussion a.o.) since it allows Movement (Copy+Merge) to apply in "sideward fashion" – not within the same, but freely between different workspaces.

(13) a. Which paper$_i$ did Mary file t_i after John read PG_i.
b. [[which paper]$_i$ did [TP Mary T [vP [vP ~~Mary~~ file [~~which paper~~]$_i$] [PP after John read [~~which paper~~]$_i$]]]]

(14) a. Mary$_i$ filed her research paper before PRO_i leaving Trans 10.
b. [TP Mary$_i$ T [vP [vP ~~Mary$_i$~~ filed her research paper] [before ~~Mary$_i$~~ leaving Trans 10]]].

What I would like to propose here is that binding into locative PP-adjuncts is another case of empirical instantiation of Sideward Movement (hence, SM).

Before we see how the sideward movement applies to our data, allow me stress that – at its core - SM is just a regular type of movement. The only true difference between a "regular" type of upward movement and the SM lies in the fact that in an instance of a sideward movement, the copy created merges not with the syntactic object that contains the source of the copying, but with another root syntactic object that is available to the computational system.

3 3 Putting things together and moving along....

Let us spell out now how SM applies to the locative PPs under consideration here. For reasons of brevity, I will illustrate my point on SC/ENG, but bear in mind that this analysis extends to other languages as well (15):

(15) a. Jovan je video zmiju pored sebe.
b. John saw a snake near himself.

What follows is a sideward movement of *Jovan* from workspace 2 to 1:

c. [$_{vP}$ [Jovan] saw the snake] [$_{PP}$ near [~~Jovan~~-SELF]]

NB: SELF checks ACC (see Hornstein 2001, 2006 on *(him)self* & Marelj 2007, 2011 on *sebe*).[4]

Crucially, it is only now that the PP merges into the Workspace 1, thus becoming an adjunct. At this point, no movement out of the PP is possible anymore!

(17) [$_{vP}$ [$_{vP}$[Jovan] saw a snake] [$_{PP}$ near-~~Jovan~~-SELF]]

The step in (17) is followed by the merger of matrix T, itself followed, in turn, by the movement of *Jovan* [Spec, TP]:

(18) [$_{TP}$ [Jovan] T [$_{vP}$ [$_{vP}$[~~Jovan~~] saw a snake] [$_{PP}$ near ~~Jovan~~ –SELF]]]

It is of a paramount importance to stress that (recall the discussion in 3.1 and 3.2) that SM will not overgenerate. The derivation converges because the movement takes place PRIOR to PP becoming the adjunct to the vP. Remember! Adjunct is a relational term: you are always an adjunct of something. Once the PP becomes an adjunct (once it is integrated into Workspace 1), the movement out it will become impossible.

Apart from the three empirical domains illustrated in 3.2 and in 3.3 above, the following examples corroborate this point nicely. As expected, a *wh*-extraction from adjunct clauses is not permitted, the difference between the grammaticality of (19b) and the ungrammaticality of (19d), brought about by the analysis of the post-verbal string as a single complement (included the clause) as in (19b) as opposed to the adjunct clause in (19d). The same analysis extends to examples in (20).

[4] SELF checks ACC (see Hornstein 2001, 2006 regarding *(him)self* & Marelj 2007, 2011 regarding *sebe*.

(19) a. I caught [Martin falling from the E(mpire)S(tate) B(uilding)].
b. Which building did you catch [ARGUMENT Martin falling from t]?
c. I grabbed (onto) Martin [ADJUNCT falling from the ESB].
d. *Which building did you grab (onto) Martin falling from t ?

(20) a. I [saw [a parcel]] [staring through the glass].
b. *What did you see a parcel staring through t?
c. I [saw [Mary staring through the glass]].
d. What did you see Mary staring through?

3.4 (Why) Should I Stay or (Why) Should I Go!?

Looking back at the derivational steps in (16) – (18), the technical elegance of SM seems unquestionable. However, if we have no real motivation for this movement, SM becomes nothing but a technical trick. So, what drives this movement? I argue that the motivation is thematic and that the failure to move will result in a derivational cancellation. Allow me to explain. There are 3 thematic roles to be discharged in (15); the predicate *see* has two thematic roles (a THEME, and PERCEIVER) and the predicate *near* has GROUND/THEME role that needs to be checked. There are, however, only 2 nominals present in the numeration that can check these thematic roles (21). "Consequently, "John" first checks the theta role GROUND/THEME first and then moves to check the thematic role PERCEIVER. The movement leaves the trace – anaphor *himself.* If the thematic role PERCEVER remains unchecked, the derivation will crash. So, uncontroversially here, movement is the last resort driven by feature checking.

(21) N= {John, a snake}

Note, further, that my analysis also implies that an anaphor and a pronoun and are in complementary distribution here. So, allow me to proceed and sketch the derivation involving *him* in English and *njega* in SC. Contra the literature, I argue that the derivation involving the pronoun *him/njega* in (22), does not involve bound variable. Rather, this is a fully-fledged - phi-complete - pronoun that needs to be pulled out of the lexicon. So, let us see how this derivation proceeds. The numeration of (22) contains three, rather than two, nominals (23):

(22) a. Jovan je video zmiju pored **njega**.
b. John saw a snake near **him**.

(23) N= {John, a snake, him}

The predicates are the same as in (15), so the number of thematic relations remains unchanged - 3 thematic relations. Having overviewed the basics, let us fast forward to the derivational step needed a converging (22):

(24) a. [$_{vP}$ saw the snake] Workspace 1
b. [$_{PP}$ near [**him**]] Workspace 2

The fact that there is one more nominal in the numeration guarantees that all the thematic features can be checked. Indeed, *him* checks the GROUND/THEME of *near* and *snake* and *Jovan* check the THEME and the PERCEIVER role, respectively (25):

(25) a. [$_{vP}$ [Jovan] saw the snake] Workspace 1
b. [$_{PP}$ near [him]] Workspace 2

Of course, there is no problem in a single nominal checking more than one thematic role. The problem here is that *him*, *John*, and *snake* need to get its interpretations in the sentence Hence, each of the 3 nominals checks 1 of the three available thematic roles. The final step in the derivation in given in (26). Two workspaces become resolved into a single workspace. Resolving the relationship between the two trees results in the PP becoming an adjunct. Merger of matrix T takes place and *Jovan* moves to [Spec, TP]:

(26) [$_{TP}$ [Jovan] T [$_{vP}$ [$_{vP}$[~~Jovan~~] saw a snake] [$_{PP}$ near him]]]

As argued by Marelj 2015, possessives in locative PP-adjuncts in SC work exactly in the same way (27): [5]

[5] As far as the differences between English and SC are concerned, see Marelj 2008, 2010 and Despić 2011, 2013.

(27) Svako je nacrtao zmiju [pored **svoje/*njegove** noge].
Everyone AUX $\text{draw}_{\text{PRT.M}}$ snake near one's/his leg
'Everyone drew a snake near his own leg.'

To my mind, a (perhaps, surprising) additional nice feature of the movement account is the ability to preserve the intuition behind the way the co-argumenthood requirement of Reinhart and Reuland without enforcing it. Allow me to explain. Since this movement is driven purely by theta-role checking, it is the moving element itself that establishes the co-argumenthood. So, rather than having to say that the preposition *near* incorporates into the verb *see* at LF thus becoming the complex predicate, it is by the virtue of a DP sharing the thematic roles of the two predicates that these two predicates become a sort of a complex predicate in syntax.[6]

Finally, an account here immediately resolves the two quite problematic and unexplained things about the *near*-PP cases. The alleged optionality between the pronoun and a logophor that was never explained in the literature is resolved as there is no optionality to start with. What also disappears is the question of why you can't use a logophor in the *near*-PPs to start with!

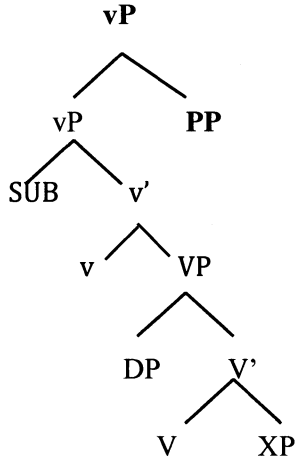
3.5 You must adjoin at the right place!

Up to this point, we have discussed the technical implementation and the motivation of the SM proposal here. What we have not discussed yet however, is the evidence that the locative phrases here adjoin at the vP level, rather than at the VP level. In this respect, my analysis is comparable to Ernst's (see Ernst 2002 et seq.) treatment of what he refers to as PPPs – Participant PPs. The analysis of (28) is given in (29):

(28) Luka caught a snake in/near the water.

[6] Since what I am arguing here is movement in syntax, the issue of whether these are small clause structures or complex predicates is orthogonal to our discussion.

(29) a.



b. ∃e [catching (e) & Agent (e, Luka) & Theme (e, the snake) & in/near (e, water)]

4 On Derivational Complexity and Multiple Workspaces

4.1 How to restrict the movement?

Interestingly, in the light of the analysis I argued for in the previous section, the uncontroversial ungrammaticality of examples like (3), repeated below as (30) now become surprising:

(30) a. ***Who** did Peter see the snake [$_{\text{PP-adjunct}}$ near ~~**who**~~]?

b. ***Pored čije** je Petar video zmiju [$_{\text{PP-adjunct}}$ ~~**pored čije**~~ noge]?
next.to whose AUX Peter see $_{\text{PRT.M}}$ snake leg

How is one to interpret this? An explanation along the lines of MTC (Hornstein 2001 et seq.) for cases like (31) (see (32) & (33) please) is directly applicable to cases like (30) as well. If a *wh*-word is waiting for C to enter the derivation, then it will necessarily be trapped in the adjunct. As discussed in 3.5, the attachment site of these adjuncts is a *v*P and the target site of the *wh*-element is [Spec, CP]. Hence, the two

requirements that need to be satisfied – the requirement of the adjunct and the requirement of the *wh*-word are contradictory. There is no derivation that can satisfy them both.

(31) * Who did John laugh at Bill [before Mary spoke to t].

(32) a. [$_{CP}$ C [$_{TP}$ [John] [$_{vP}$ [~~John~~] laugh at Bill]]] Workspace 1
b. [$_{PP}$ before Mary spoke to [who]] Workspace 2

(33) [$_{CP}$ **C** [$_{TP}$ **[**$_{TP}$ [John] [$_{vP}$ [~~John~~] laugh at Bill]] [$_{PP}$ before Mary spoke to **[who]**]]]

The noted challenge (see Hornstein 2001 et seq.) for such an account arises if *wh*-movement can proceed via the edge of the *vP* phase (as nowadays standardly assumed in the phase theory) because it allows the *wh*-phrase to move to the edge of the *vP* PRIOR to adjunction. This "escape hatch" opens SM to allow massive over-generation. I turn to this issue directly.

4.2 Timing is Everything!

Before I explain how we can account for this, allow me to make a very short digression and present one more piece of data. Not only are the *wh*-LBE cases like (30a) above bad, but the pure LBE cases – where "pure" means that no other feature but [+LBE] is checked – seem to be even worse! And the speakers were quite unanimous regarding this point!

(34)	*Pored	debele	je	Marko	video	zmiju [t	žene]
	next.to	fat	AUX	Marko	see$_{PRT.M}$	snake [t	woman]

What does that tell us? It tells us that the problem exceeds the question of *wh*-movement and the actual position of *wh*-elements as the non-*wh* movement out of this PP is even worse. This is exactly what I argue here and that is exactly the reason why I will focus here on the status of the relevant PP, rather than on the status of the moving element. Allow me to explain. Recall that adjuncts are relational notions – you are an adjunct of something. Crucially, what that means is that the process of adjunction presupposes the existence of something to adjoin. And this this simple observation is the crux of the discussion here since it begs the following question: When is the adjunction relation implemented? I argue that this

must happen as soon as the adjunction site is created. In case of a *v*P, this happens at the point when the *v*P is created. I formulate it as (35) below:

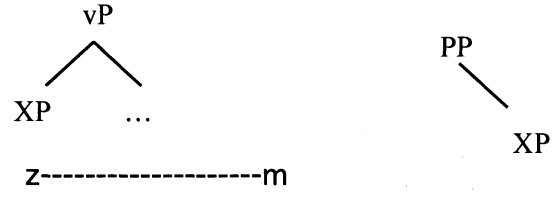
(35) **Multiple Workspaces Earliness Hypothesis**
The derivation must resolve to a single workspace at the earliest possible convenience, where "at the earliest possible convenience" means" "at the point when the adjunction site is created."

What is the rationale behind (35)? I argue that – not only the direction of (from more complex to less complex) but also the timing of syntactic computations (resolve to a single workspace as soon as possible) are guided by a more general requirement to reduce the computational complexity.

Once more, an adjunct creates an island only once it is adjoined to something. You can think of the matrix and the embedded domain as (a partially) parallel subtrees. At the point in (36), you can freely extract out of the PP simply because its status as an adjunct is not established yet. In that respect, it behaves no different that if you are extracting out of a complement PP.

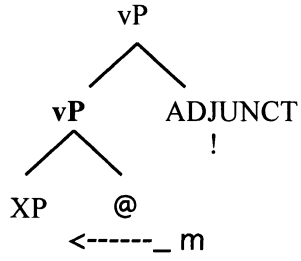
(36)

a. Workspace 1 Workspace 2:



At the point where the vP is completed, the adjunction site exists and PP must be adjoined to it before any further operation takes place.

b. Single workspace:



So, it is the timing of the extraction that makes a difference. The OUT-OF the PP movement as in *John saw a snake near himself* happens prior to the PP becoming an adjunct because this movement is literally building the adjunction site (*v*P). But once the adjunction site is build, the multiple workspaces must immediately resolve to a single (matrix) workspace resulting in the PP becoming an adjunct of the *v*P. As a result, all subsequent movement OUT-OF the PP will be barred, regardless of whether the moving element is a *wh-* or a "pure"-LBE element.[7] Since it is guided by a more general requirement to reduce the computational complexity, it is the resolution of the multiple workspaces that takes precedence over movement operations out of the PP.

5 Conclusions

Under a derivational approach (phase-based and movement-based approaches alike), syntactic computations proceed from more complex (embedded) to less complex domains. Technically, such syntactic computations proceed via the Sideward Movement, argued further to freely apply between workspaces. Not only can SM deal elegantly with complex syntactic environments, but it also allows one to treat adjuncts as relational, rather than as an absolute notion. This is conceptually and empirically desirable since a given expression is only an adjunct in relation to another expression Despite its elegance, SM in not unproblematic. Though the multiple workspaces get to be resolved into a single – matrix – workspace, the issue of timing– i.e. the point in the

[7]As correctly pointed by the reviewer the fact that the LBE out of argumental PPs is much better underscores the validity of the main argument here further.

derivation when multiple workspaces must resolve to a single derivational space has not been addressed in the literature. SM cannot really apply freely since it would - empirically incorrectly - render something like **Who did John laugh at Bill [before Mary spoke to t]* grammatical. To address such issues, I propose the Multiple Workspaces Earliness Hypothesis according to which the derivation must resolve to a single workspace at the earliest possible convenience, where "at the earliest possible convenience" means" "at the point when the adjunction site is created." I argue that – not only the direction of (from more complex to less complex) but also the timing of syntactic computations (resolve to a single workspace as soon as possible) are guided by a more general requirement to reduce the computational complexity. On the empirical side, the technical apparatus and the analysis I propose here, allow me to capture the seemingly contradictory binding facts involving locative PPs.

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Polish Numeral NP Agreement as a Function of Surface Morphology*

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1 Introduction

In this paper we examine the well-known thorny problem of Polish numeral NP subjects, which can fail to trigger agreement or to show up in the nominative case expected in the subject position:

(1) a. Dwie dziewczyny przyszły.
two.F.NOM=ACC girl.PL.NOM=ACC came.NV.PL
'Two girls came.'

b. Pięć dziewczyn/kotów przyszło.
five.NV. NOM=ACC girl.PL.GEN/cat.M.PL.GEN came.N.SG
'Five girls/cats came.'

Two factors are crucial in determining which case the cardinal surfaces in and whether the numeral NP subject gives rise to agreement on the verb: the cardinal itself (the cardinals 'five' and higher never give rise to

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agreement on the verb, while the paucal cardinals 'two' to 'four' can do so) and the gender of the lexical NP (while the cardinal appearing with virile lexical NPs surfaces in the genitive case, paucal cardinals appearing with non-virile lexical NPs are marked nominative). Verbal agreement is only possible with paucal cardinals and then only if the lexical NP is marked nominative. Crucially, we will demonstrate that cases that have been analyzed as involving nominative virile paucal cardinals (giving rise to the apparent optionality of genitive case-marking and default agreement with virile paucal cardinals) should be rather regarded as containing cardinality adjectives.

We will argue that these complex patterns can be accounted for if a number of independently needed assumptions are made. First of all, we will argue for the individuation feature distinguishing cardinals and measure nouns from other sortals. We will show that it is the absence of that feature that makes it impossible for T° to agree with the cardinal itself. We will adopt the proposal by Schenker (1971), according to which measure NPs can and numeral NPs must be assigned accusative case if no other case is assigned to them, thus deriving the surface nominative and genitive case-marking from the independently motivated accusative case syncretism depending on whether the lexical NP is virile or not. We will then demonstrate that agreement is sensitive to the surface case-marking on the lexical NP, which is not surface-genitive only with non-virile paucal cardinals, and provide independent evidence that the lexical NP is no less accessible to agreement than the cardinal.

1.1 Paucal vs. Non-paucal (Simplex) Cardinals

Two factors crucially enter into agreement patterns of Polish numeral NP subjects: the choice of the cardinal (the paucal cardinals two to four vs. the rest) and the gender specification of the lexical NP. Starting with the former, the paucal cardinals agree in gender and case with the NP they combine with and trigger plural number agreement on the verb (2a), whereas the higher cardinals combine with a genitive-marked NP and give rise to the default agreement on the verb (2b).[1]

[1] In oblique cases the cardinal and the lexical NP are marked with the same case, irrespective of the cardinal. See Babby (1980), Franks (1995), Bailyn (2004), Rakhlin (2003), Pereltsvaig (2006) and Kosta (2014) for a discussion of the same pattern for Russian.

(2) a. Dwie dziewczyny/dwa koty przyszły.
two.F girl.PL.NOM/two.NV cat.M.PL.NOM came.NV.PL
'Two girls/cats came.'
b. Pięć dziewczyn/kotów przyszło.
five.NV girl.PL.GEN/cat.M.PL.GEN came.N.SG
'Five girls/cats came.'

The first impression is therefore that NP-internal and NP-external agreement are conditioned by the same factor. As we now show, this is not the case: paucal cardinals can fail to trigger verbal agreement when they combine with a virile lexical NP.

1.2 Virile vs. Non-virile Lexical NPs

While in the singular Polish, like Russian, distinguishes three genders (feminine, masculine and neuter), in the plural there are only two: virile (a.k.a. masculine personal; defined as containing at least one male) and non-virile (Brooks (1975:265), Wiese (2006), etc.). The distinction between the two is morphologically manifested in three ways: (i) in pronominal direct cases: virile nominative *oni*, accusative *ich* (after prepositions, *nich*) vs. non-virile *one*, accusative *je* (after prepositions, *nie*); (ii) in past-tense verbs and in nominative-marked adjectives and participles: virile ending *-i* vs. non-virile *-y*; and (iii) in accusative syncretism: accusative is realized as genitive with virile NPs and as nominative with non-virile ones.

The virile/non-virile distinction also affects numeral NP subjects (Decaux (1964), Brooks (1975), Swan (2002), etc.): while the higher cardinals are marked genitive in the subject position with virile lexical NPs, with non-virile ones they surface in the nominative:

(3) a. Pięciu chłopców przyszło.
five.V.GEN boy.M.PL.GEN came.N.SG
'Five boys came.'
b. Pięć dziewczyn/kotów przyszło.
five.NV. NOM girl.F.PL.GEN/cat.M.PL.GEN came.N.SG
'Five girls/cats came.'

Demonstratives (as well as APs) can agree in case with either the cardinal or the lexical NP: they surface in the genitive form (*tych*) with

virile numeral NPs, and alternate between the surface genitive (*tych*) and the surface nominative (*te*) with non-virile numeral NPs:

(4) a. tych /te pięć kobiet/okien/kotów
this.NV.PL.GEN/NOM five.NV. NOM woman.PL.GEN/
window.PL.GEN/cat.PL.GEN
'these five women/windows/cats'
b. tych /*ci pięciu mężczyzn
this.V.PL.GEN/ NOM five.V.GEN man.PL.GEN
'these five men'

The question arises why virile numeral NPs are marked genitive. Corbett (1978) suggests that the higher cardinals agree with virile NPs in case, but offers no explanation for why this happens only with virile NPs. The alternative, accounting for both virile and non-virile numeral NPs, is the so-called Accusative Hypothesis (Schenker (1971), Franks (1995, 2002), Przepiorkowski (1997), Rutkowski and Szczegot (2001), Rutkowski (2002, 2007), Miechowicz-Mathiasen (2011), etc.), linking surface case-marking to accusative syncretism.

2 The Accusative Hypothesis and Alternatives to It

The cardinals surfacing as genitive in virile numeral NP subjects and as accusative in non-virile ones can be explained if numeral NP subjects are underlyingly accusative. As discussed above, accusative case-marking is syncretic with genitive for virile NPs and with nominative for the rest (5), so the distribution of cases on the cardinal is explained, and agreement failure can be reasonably made to correlate with the accusative marking on the subject in ways to be made precise below.

(5) a. Widzę te koguty. Sadowska (2012:119)
see.1SG these.ACC=NOM roosters.ACC=NOM
'I see these roosters.'
b. Widzę tych studentów.
see.1SG these.ACC=GEN students.ACC=GEN
'I see these students.'

The question however arises of why numeral NP subjects should be marked accusative and the answers proposed do not seem satisfactory.

Thus Miechowicz-Mathiasen (2011) proposes that numeral NP subjects are actually PPs headed by a null preposition, yet does not explain either the semantics of this preposition or its distribution: when if ever can it be absent; if so, why, and if not, why not? Willim (2015), on the other hand, proposes that the surface accusative case-marking is actually the default realization of case: assuming that numeral NP subjects are phi-deficient (cf. Klockmann (2012, 2013)), Willim proposes that they fail to agree with T° and as a result, receive no case from it; the lack of syntactic case is then realized as accusative. The obvious problem with this proposal is that in Polish, like in many other languages, the lack of case is generally realized as surface nominative: a Vocabulary Insertion rule system that would treat accusative as an Elsewhere rule (when no case features are specified on numeral NPs) while maintaining nominative exponence for non-numeral NPs is far from obvious to construct.

Willim does not address this issue, as she only considers the realization of unvalued case and does not explore the question of what unifies the realization of unvalued case in the plural with the realization of accusative, yet the main problem with treating numeral NP subjects as unmarked for syntactic case as a result of agreement failure is empirical, and comes from case-marking on paucal cardinals.

3 The Role of Surface Case-Marking

The connection between case-marking on the cardinal and agreement is most clear with numeral NP subjects headed by paucal cardinals, which are generally considered to appear in the nominative case. As examples (6) show, surface nominative case-marking correlates with agreement on the verb. Furthermore, when the lexical NP is virile, case-marking on the cardinal can be either nominative or genitive, with concomitant default marking on the verb in the latter case:

(6) a. Dwie dziewczyny przyszły.
two.F girl.F.PL.NOM came.NV.PL
'Two girls came.'

b. Dwa koty przyszły.
two.NV cat.M.PL.NOM came.NV.PL
'Two cats came.'

(7) a. Dwaj chłopcy przyszli.
two.V.NOM boy.M.PL.NOM came.V.PL
'Two boys came.'

b. Dwóch chłopców przyszło.
two.V.GEN boy.M.PL.GEN came.N.SG
'Two boys came.'

While the correlation between surface case morphology and verbal agreement is straightforward, the cause and effect are far from clear. It is not the case that the surface nominative obligatorily yields agreement (it does not do so for the higher cardinals). Agreement, on the other hand, always entails nominative case-marking (6)-(7a), yet why does it fail in (7b), permitting the genitive (underlying accusative) variant to arise?

The novel claim that we make here is that the surface nominative case in (6) and the surface genitive in (7b) actually also correspond to an underlying accusative, showing exactly the same syncretism for the virile vs. non-virile distinction as that arising with the higher cardinals. It is, in our view, the nominative variant in (7a) that requires explanation, and we propose that the nominative forms *dwaj* 'two', *trzej* 'three', and *czterej* 'four' are not cardinals at all, but rather cardinality adjectives. Evidence for this claim comes from complex cardinals, which all behave like the higher cardinals in that their case-marking is determined by whether the lexical NP is virile. While inside a non-virile numeral NP subject, paucal cardinals forming part of a complex cardinal do not differ from their simplex counterparts in that they agree in gender, surface with nominative case on the cardinal and trigger plural agreement on the verb, a virile complex cardinal cannot contain the nominative forms *dwaj* 'two', *trzej* 'three', and *czterej* 'four', and only the genitive form is possible:

(8) a. Są dwadzieścia dwie kobiety.
be.PL twenty.NV two.F.NOM woman.F.PL.NOM
'There are twenty-two women.' Alexander (2002-2003)

b. Dwadzieścia trzy koty bawiły się.
twenty.NV three.NV.NOM cat.M.PL.NOM play.NV.PL REFL
'Twenty-three cats were playing.' Swan (2002:199)

(9) a. * dwadzieścia/dwudziestu dwaj/trzej/czterej chłopcy
twenty.NV/twenty.V two/three/four.V.NOM boy.PL.NOM
b. Dwudziestu dwóch/trzech/czterech chłopców przyszło.
twenty.V two/three/four.V.GEN boy.PL.GEN came.N.SG
'Twenty-two/three/four boys came.'

Given the existence of the genitive virile simplex paucal cardinals (7b) alongside their nominative counterparts (7a), the correct empirical generalization is that paucal cardinals, be they simplex or complex, give rise to exactly the same accusative syncretism as the higher cardinals do: the surface nominative form of non-virile numeral NPs in (6) and (8) contrasts with the surface genitive form of virile numeral NPs in (7b) and (9b). What requires explanation therefore is the nominative virile forms in (7a). To account for their unexpected case-marking and their inability to appear in complex cardinals, we hypothesize that *dwaj/trzej/czterej* are adjectives. Adopting for cardinals the non-intersective semantics in (10) (Ionin and Matushansky (2006)), we suggest that the nominative forms are cardinality adjectives with the intersective semantics in (11), assumed for cardinals in more standard approaches (Link (1987), Landman (2003), etc.).[2] For non-virile numeral NPs the two cannot be distinguished, and so examples (6) could in principle correspond to either of the two structures: with an accusative cardinal or a nominative cardinality adjective. In the complex cardinals, on the other hand, only the former is allowed.

(10) $[\![\text{trzech}]\!] = \lambda P{\in}D_{\langle e,t\rangle} . \lambda x{\in}D_e . \exists S{\in}D_{\langle e,t\rangle} [\ \Pi(S)(x) \wedge |S| = 3 \wedge \forall s{\in}S\ P(s)\ ]$, where $\Pi(S)(x)$ if S is a partition of the plural individual x

(11) $[\![\text{trzej}]\!] = \lambda P{\in}D_{\langle e,t\rangle} . \lambda x{\in}D_e . [\ P(x) \wedge |x| = 3]$

It is far from clear that nominative virile forms of paucal cardinals differ from their genitive counterparts in anything other than their lexical category and therefore syntax. A difference in interpretation is reported, but the reports do not agree, thus Decaux (1964) associates the nominative form with specificity, whereas Swan (2002:190) makes a

[2] As measure nouns cannot be pluralized (Ruys (2017)), these cardinality adjectives are predicted to be incompatible with measure phrases. This prediction, however, cannot be verified, as there are no virile measure nouns.

different claim, namely that the nominative form is only used for all-male groups (which would make it different from all other instances of the virile, which are compatible with a female-male mixture). Wągiel (2015) supports Swan's claim observing that nominative virile forms entails that the group is all-male, unlike collective numerals such as *dwoje* 'two', which require the presence of at least one male and one female individual in the set whose cardinality they assert, yet Wągiel does not discuss their genitive virile counterparts. Be what may, the difference proposed in (10) vs. (11) does not lead us to anticipate anything of the kind.

Summarizing, a closer examination of the data strongly suggests that all plural numeral NP subjects exhibit the case-marking pattern that is characteristic of the accusative syncretism in the plural and therefore are underlyingly accusative. Given the lack of distinction in this regard between paucal cardinals (which trigger plural agreement on the verb if nominative) and the higher cardinals (which always occur with default agreement), verbal agreement or its lack do not seem to determine case-marking. Rather, plural agreement on the verb would seem to be possible only when the cardinal is not only marked for surface nominative, but also is adjectival, which is what paucal cardinals clearly are and the higher cardinals just as clearly are not.

Two questions therefore arise: why do most numeral NP subjects fail to trigger agreement on T° and how those that do, do so. To answer the former question, we will examine the broader pattern of agreement with measure phrases, which will in turn suggest the answer to the latter.

4 The Role of the Individuation Feature

Regular plural NPs in the subject position trigger plural agreement on the verb, which can be virile or non-virile:

(12)a. Chłopcy spali. Klockmann (2012)
boy.M.PL.NOM slept.V.PL
'The boys slept.'

b. Ptaki spały.
bird.M.PL.NOM slept.NV.PL
'The birds slept.'

Prior research investigating agreement failure with the higher cardinals (Schenker (1971), Franks (1994, 1995), Przepiorkowski (1997), Miechowicz-Mathiasen (2011, 2012), etc.) attributes it to the fact that such numeral NP subjects are accusative rather than nominative. However, as we have just shown, for the paucal cardinals this is true to exactly the same degree. It cannot therefore be the underlying case-marking that is responsible for the lack of agreement, yet neither can it be claimed that the surface form can be held uniquely responsible for it either, since nominative-marked non-virile numeral NP subjects headed by the higher cardinals also fail to trigger agreement. We suggest therefore that it is the case-marking on the lexical NP that determines the ability of a numeral NP to agree. Following Bobaljik (2008) we hypothesize that a non-direct case can render an NP inaccessible for agreement -- what is new here is the role of the surface case-marking rather than the underlyingly assigned case. In other words, we assume, following the general consensus, a contrast between paucal numerals and the higher numerals that makes agreement possible for the former but not for the latter, and then suppose an additional factor blocking agreement for genitive-marked subject NPs.

2.1 Phi-deficiency of Cardinals

To account for the contrast between the behavior of paucal cardinals and the higher cardinals with respect to agreement, it has been suggested that the higher cardinals are phi-deficient and therefore fail to agree with T°. The question naturally arises which feature is missing from their featural make-up. Klockmann (2012, 2013) claims that NPs headed by the higher cardinals lack the gender feature, and Willim (2015) proposes that they lack the case feature. Rejecting both approaches for reasons to be detailed below, we hypothesize that what cardinals lack is the individuation feature (Matushansky and Ruys (2015a)) -- a deficiency that they share with measure nouns, which are not likely to otherwise be considered impoverished in person, gender or case. Indeed, as noted by Schenker (1971) in support of the Accusative Hypothesis, measure phrases in the subject position in Polish can be marked accusative, which is detectable on feminine nouns as a dedicated exponent:

(13)a. Było jeszcze kupę czasu. Schenker (1971)
was.N.SG still a.lot.ACC time.GEN
'There was still a lot of time.'

b. Furęksiążek zostało w starym domu.
a.lot.ACC book.PL.GEN remained.N.SG in old house
'A lot of books remained in the old house.'

In line with this is the fact that they can, contrary to prescriptive usage, fail to trigger agreement, even with surface nominative.

(14) Zagrodzone jest prawie całe przejście, **zostało** metr
barred is almost entire passage left.N.SG meter.M.NOM
szerokości do przeciskania.
width.GEN to squeeze
'Almost the entire passage was barred, there was a meter of width left to squeeze.' (http://pentax.org.pl/viewtopic.php?p=18816)

The same effect is observed by Alexander (2002-2003), citing Doroszewski (1995) for the observation that paucal measure phrases can fail to trigger agreement on the verb (15). The correlation between the accusative in the subject position and agreement failure is, therefore, clear, and, crucially, is not limited to numeral NP subjects:

(15)a. Ubyły/ubyło cztery centymetry wody.
diminish.PAST.NV.PL/N.SG four.NV centimeter.M.PL water
'The water had gone down 4cm.'

b. Zostały/zostało nam dwie godziny.
remain.PAST.NV.PL/N.SG us.DAT two.F hour.F.PL.NOM
'We had two hours left.'

The question of optionality naturally arises: whereas measure NPs *can* fail to trigger agreement on T, numeral NPs (with the exception of surface-nominative paucal numeral NPs) *must* fail. This naturally means that whatever property or its absence is responsible for agreement failure and accusative case-marking, it must characterize all numeral NPs, yet vary for measure phrases. The previous approaches to phi-deficiency of cardinals do not appear to achieve this result or indeed extend to measure NPs in a natural way.

The hypothesis that the higher cardinals lack gender (Klockmann (2012, 2013, 2017)) is clearly independently motivated. Unlike numerical nouns, such as *dwójka* 'two' (see Swan (2002:203-205), Wągiel (2015)), they do not introduce any lexical gender and, unlike the paucal cardinal *dwóch/dwie/dwa* 'two' and its definite counterpart *obu/obie/oba* 'both', they do not show gender agreement with the lexical NP.[3] The gender deficiency hypothesis does not, however, extend to measure nouns, nor does it explain the correlation between the gender of paucal cardinals and their syntactic behavior. Indeed, both case-marking on the cardinal itself and its agreement (for paucal cardinals) depend on whether the numeral NP subject in question is virile, strongly suggesting that numeral NP subjects cannot be underspecified for gender. Moreover, APs, be they attributive, predicative or depictive, agree with numeral NPs in number, gender and case. Specifically, while APs agreeing with virile numeral NP subjects (16) only surface as genitive, APs agreeing with non-virile ones (17) can also be marked nominative (for the availability of both options in one and the same clause, see Przepiórkowski and Patejuk (2012); across non-finite clause boundary, Witkoś (2008)), and the case exponent then is the non-virile *-e* rather than the virile *-i*:

(16) Następnych/*następni kilkadziesiat mężczyzn było
next.PL.GEN/.NV.PL.NOM several.tens.NOM man.PL.GEN was.N.SG
czystych/*czyści.
clean.PL.GEN/.V.PL.NOM
'The next few tens of men were clean.'

(17) Pięć osób przyszło pijanych/pijane.
five person.F.PL.GEN arrived.N.SG drunk.GEN/NV.PL.NOM
'Five people arrived drunk.'

While it is possible that gender specification of higher numeral NP subjects lacks the features responsible for the feminine/masculine/neuter and animate/inanimate distinctions in the singular, there is no evidence to suggest that these distinctions are ever operative in the plural.

[3] The paucal cardinals *trzy* 'three' and *cztery* 'four' do not show morphological agreement for gender, but otherwise have the same external and internal syntax as *dwóch/dwie/dwa* 'two' and *obu/obie/oba* 'both'.

Another proposal, by Willim (2015), is that NPs headed by cardinals five and up lack the case feature (though in structural case positions only) and the person feature, and the realization of the lack of case as genitive in the virile and as nominative in the non-virile is determined at PF. Several issues arise with this proposal. On the one hand, the common view is that the third person is not a particular feature value, but rather lack of person. On the other hand, no explanation is provided for how, if numeral NPs are not specified for case, they can nonetheless be marked for oblique cases. Finally, agreement with non-virile paucal NPs does not fit into either view, and neither does optional agreement failure with measure NPs.

2.2 The Individuation Feature in Polish and Cross-linguistically

While subscribing to essentially the same view, namely that numeral NPs are phi-deficient, we differ from the approaches discussed above in that we locate the phi-deficiency of cardinals and measure nouns in the novel individuation feature, which cardinals lack altogether and measure nouns may have optionally. Independent evidence for this feature comes from the fact that a contrast between measure nouns and other sortals can be observed in a number of languages NP-internally as well.

Thus in a number of languages most or all measure nouns do not bear plural morphology when combining with cardinals (Matushansky and Ruys (2014, 2015a, b)). While this lack of number marking has been discussed for Dutch (Klooster (1972)), Danish (Hankamer and Mikkelsen (2008)) and German (Grestenberger (2015)), it is also operative in Modern Hebrew, Persian (Mathieu and Zareikar (2015)) and Western Armenian (Donabédian (1993)).

It is frequently suggested, in order to explain this number marking failure, as well as some other properties of measure nouns, that measure nouns are functional rather than lexical or that they are classifiers. While the lack of the individuation feature in combination with countability may in fact constitute the definition of a classifier that would cover their uses in classifier languages and outside of them, we will remain agnostic on this point. We note, however, that classifiers in languages that have them are systematically incompatible with plural morphology, which, at least in Germanic, is not the case for measure nouns.

2.3 The Mechanics of the Accusative Hypothesis

To implement the link between individuation and Polish agreement and case, we propose, following Matushansky and Ruys (2014, 2015a, b), that the individuation feature forms part of the phi-feature bundle on T° along with person, number and gender. As the entire bundle must be valued by the same goal, agreement on T° would fail when the goal does not bear the individuation feature. Below we will argue that two goals are in principle available here, the cardinal itself and the lexical NP, and while the former, lacking the individuation feature, cannot trigger agreement, the latter can if it bears appropriate surface case. Before we can do so, however, it is necessary to determine how case-marking on numeral NP subjects is established.

It is tempting to derive failure of case-marking from agreement failure, as in Willim (2015). Yet any attempt to construct the appropriate Vocabulary Insertion rules, while still maintaining that nominative is the morphological default, systematically fails to capture the generalization that the realization of the lack of case is the same as that of accusative: to capture the former intuition it is necessary to assume that accusative corresponds to some morphosyntactic feature, but if it does, the same realization is not expected when no features are present.

The alternative would be to hypothesize a valued case feature on cardinals in the lexicon. Schenker (1971) suggests indeed that measure nouns and cardinals not assigned an oblique case are assigned accusative by an unspecified mechanism. Dyła (1991) and Rappaport (2003) propose a variant of this view, where cardinals have no nominative case form but are inherently specified for the case feature [quantitative], which is realized as genitive for virile NPs and as nominative elsewhere. While the latter approach does not explain why [quantitative] is subject to exactly the same syncretism as [accusative], for the former proposal it is incidental that inherent accusative case is associated with measure nouns and cardinals.[4] Furthermore, neither approach explains why for measure nouns this association is optional.

[4] If the abstract accusative case (subject to morphological syncretism) can be the result of a number of different case feature bundles sharing no common core, this objection clearly does not apply, as the system would then require rules of referral that can easily realize as accusative a number of different feature specifications.

What we need is a non-random connection between the negative specification (or lack) of the individuation feature and the formal feature (bundle) corresponding to the accusative case. While it seems unlikely that *v* assigns exactly the same feature as the one present on measure nouns, if we assume, following the tradition starting with Jakobson (1936/1971, 1958/1984), that cases are feature bundles rather than atomic features, and that these features reflect the formal (syntactic or semantic) makeup of the syntactic environment of the NP in question (Bailyn (2004), Matushansky (2008, 2010, 2012), Pesetsky (2013)), then it is possible that the accusative case in Polish realizes a particular feature F that is part of the set of features assigned by *v* and also inherently present on cardinals (and optionally, on measure nouns). Importantly, in all approaches assuming a case feature present on cardinals and measure nouns by virtue of their lexical semantics, it is completely irrelevant whether they receive case from T°, as the more marked inherent case will override structural cases.

3 Case-sensitive Agreement

In sum, the descriptive generalization is that all numeral NP subjects in Polish bear the same case (be it accusative or none) and verbal agreement takes place when two conditions obtain: (1) the cardinal agrees for gender, and (2) the surface realization of this case is the same as nominative. Above we have argued that cardinals and measure nouns fail to trigger agreement (and perhaps receive case) due to the lack of the individuation feature. This hypothesis, however, predicts incorrectly that full agreement with paucal cardinals, as in (6), should be impossible.

As discussed above, it is unreasonable to argue that paucal cardinals differ from the higher cardinals in their underlying case-marking, which entails that they are all [-individuated]. Even if we were to abandon this conclusion and follow Klockmann or Willim in assuming that paucal cardinals are not phi-deficient, we would still fail to account for agreement failure with virile paucal NP subjects. Even if the virile were assumed to be the default gender (or the lack of gender), cf. Ruda (2011), this would not be sufficient, as in the absence of a paucal cardinal virile NPs trigger plural agreement (12a).

We propose therefore that Polish verbal agreement is sensitive to surface case (cf. Bobaljik (2008)). More specifically, what the verb

agrees with is systematically the lexical NP: where it is marked genitive, for whatever reason, agreement fails. Evidence that both the entire numeral NP and the lexical NP are accessible for agreement comes from the two agreement options available for AP predicates (17).

As noted by Dyła (1991) and Przepiórkowski and Patejuk (2012), it is not only the case that APs and determiners show two case-marking options for non-virile numeral NP subjects, it is also that the two patterns can appear in the same NP (ex. from Dyła (1991)) or in the same clause (ex. from Przepiórkowski and Patejuk (2012), all four logically possible combinations are allowed):

(18) Wypiłem jakieś dobre/dobrych pięć butelek wina.
drank.1SG some.ACC good.ACC/GEN five.ACC bottles.GEN wine
'I drank a good five bottles of wine.'

(19) Kolejne piecdziesiat aut zostało uszkodzonych.
further.NOM fifty.NOM car.PL.GEN became.NSG damaged.GEN
'Further fifty cars became damaged.'

To account for the two options, Przepiórkowski and Patejuk (2012) propose that APs can agree either with the (genitive) lexical NP or with the entire cardinal-containing NP (surface-nominative). Adopting this analysis, we implement it via probing order: given that D° and A° must be specified, minimally, for [number] and [gender], either of these two features can be the first to probe:[5] (i) [gender]: the cardinal not being specified for gender, the next goal is the lexical NP; case being a free-rider, it gets valued genitive; (ii) [number]: the cardinal is specified for number by virtue of its semantics and therefore can function as a goal; case, as a result, gets the same value as on the cardinal (genitive with virile NPs, nominative with non-virile ones).

[5] The mechanism by which adjectives can probe the NPs they agree with is immaterial here. However, for this proposal to work, [gender] and [number] located on the same head should be able to get valued by different goals. Given that in this case the different goals are themselves in feature-sharing relations, it can be assumed that they therefore do not interfere with each other.

We can now derive the different syntax of the two types of cardinals from their case-assigning properties: while the higher cardinals assign genitive case to the lexical NP, paucal cardinals agree with it (2). Given that the cardinals themselves, lacking the individuation feature, do not provide a proper goal for T°, T° probes the next available goal, which is the lexical NP. Assuming that genitive case-marking makes an NP inaccessible for such probing, virile numeral NP subjects will fail to trigger agreement because both the cardinal and the lexical NP there are marked genitive throughout. For paucal cardinals, on the other hand, the lexical NP ends up surface-nominative if it is non-virile, and therefore becomes accessible to agreement. Finally, to complete the picture, the cardinality adjectives do not intervene for agreement -- if they even bear the individuation feature at all, it gets valued from the lexical NP.

4 Conclusion

In this paper we have established a new empirical generalization about plural numeral NP subjects in Polish. Contrary to the standard view, which regards paucal numeral NP subjects as nominative, we argued that they are actually accusative as well and subject to the same accusative syncretism as that governing case-marking on the higher cardinals and plural direct objects in Polish. On the basis of their ungrammaticality in complex cardinals, we argued that virile nominative forms of paucal cardinals are actually adjectives.

Following Schenker's intuition, we linked accusative case-marking to the lack of the individuation feature. Independent evidence for that comes from accusative marking and agreement failure with measure NPs in Polish and a more systematic cross-linguistic failure of measure nouns to trigger agreement or to show plural morphology. Finally, we adopted the proposal (Bobaljik (2008)) that NPs bearing oblique (non-nominative) cases are inaccessible for agreement. If this constraint applies to surface case-marking (or, to be precise, at some point after the application of various rules of referral responsible for accusative syncretism), verbal agreement becomes possible only when the lexical NP is marked nominative, i.e., with paucal non-virile numerals.

Independent evidence for the accessibility of the lexical NP to probing comes from the apparent optionality of case-marking on APs agreeing with numeral NP subjects: the APs in question can agree in case

either with the cardinal or with the lexical NP. We proposed that both options can be derived depending on which feature probes first, number or gender.

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Old Church Slavonic was Head-initial*

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This paper addresses the issue of head directionality in Old Church Slavonic (OCS). Whereas some analyses assume that OCS was head-initial on a par with Modern Slavic (Willis 2010, Jung 2015, Jung & Migdalski 2015), some other accounts postulate that OCS was T-final (Pancheva 2005, 2008) or X^0-final in the VP-domain but X^0-initial in the CP-domain (Dimitrova-Vulchanova & Vulchanov (2008). This paper argues that there is little evidence for head-finality of OCS: the diagnostics used in support of this claim give wrong predictions when applied to the same patterns in Modern Slavic, and they are also challenged by diachronic consideration that have not been addressed by the proponents of T-finality. In particular, this paper examines the arguments provided by Pancheva (2005; 2008) in favor of T-finality on the basis of the position of clitics (section 1), the position of negation (section 2), and participle-auxiliary orders (section 3).

1 The Position of Clitics

1.1 The Diachrony of Cliticization in Bulgarian

Pancheva (2005) assumes T-finality to account for diachronic changes in Bulgarian cliticization. She observes three different cliticization patterns

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in the history. Thus, she shows that Old Bulgarian (9th-13th c.), on a par with OCS,[1] features mostly post-verbal clitics (see 1a), which she analyzes as left-adjoined to final T^0 (see 1b). Pancheva (2005: 146) presumes that in Old Bulgarian lexical verbs do not reach T^0 but only Asp^0 below T^0, so her evidence for the final T^0 comes from the position of the auxiliary "be" (such as *estъ* in 1a) located in T^0 with respect to pronominal clitics (*ja* in 1a).

(1) a. svętъ bô mõžъ stvorilъ *ja* jestъ
holy because man $\text{create}_{\text{PART.M.SG}}$ them_{ACC} is_{AUX}
'Because a holy man has created them.' (9th c. Bg)
b. $[_{TP}\ [_{vP}\ [_{V'}\ t_i\ V^0\ ]]\ [_T\ CL_i\ T^0]]$ (Pancheva 2005: 139)

In the period from the 13th to the17th c., pronominal clitics in Bulgarian move to second position, which Pancheva attributes to a change in the head parameter of T^0, which switched from being head-final to head-initial. She argues that due to the switch pronominal clitics start to occur in front of T^0 and their placement with respect to the verb becomes reversed (see 2a; Pancheva 2005: 151). Other constituents may now appear between the verb and the clitic, so the verb is no longer interpreted as the host for the clitics. Since the clitics maintain a leftward phonological dependency, they now lean onto their new hosts located in Spec, TP (see 2b and c) or Spec, CP.

(2) a. [TP [TP (cl) [TP XP =CL T [AspP [Asp V Asp]]]]]
b. tova *se* pomoli Juda bogu
that_{TOP} REFL $\text{ask}_{\text{PART.M.PL}}$ Judas God
'Judas asked God that_{TOP}' (18th c. Bg, Pancheva 2005: 154)
c. a tïa *gy* zlě mõčaše
and she them_{ACC} badly tortured
'She tortured them badly.' (17th c. Bg, Pancheva 2005: 123)

[1] An anonymous reviewer informs me that the two texts cited in Pancheva (2005) as Old Bulgarian were composed during the OCS period. Since their original versions were lost, we only have access to the copies that were written later, with some modifications reflecting post-OCS grammar.

Importantly, Pancheva observes a restriction on the syntactic status of the elements preceding the Wackernagel clitics during this period. Namely, she notes that in all the corpus data she studied the clitics strictly follow the first word, rather than a branching phrase, at times leading to Left Branch Extraction. Interestingly, Radanović-Kocić (1988) makes the same observation about Old Serbian data in which Wackernagel cliticization was emerging, which I assume shows that the Old Bulgarian data examined by Pancheva (2005) illustrate the initial stage of the switch into second position cliticization, which was not completed. In all contemporary Slavic languages pronominal clitics may follow a single word or a branching phrase alike, though there are restrictions imposed by sentential clitics such as *li* in Serbian, which may be preceded by only a single word, as observed by Bošković (2001) and illustrated in (3).

(3) Skupe (*li*) knjige (**li*) Ana čita?
expensive Q books Q Ana reads
'Does Ana read expensive books?' (Bošković 2001: 27)

Bošković (2001: 31ff.) proposes to capture this restriction by suggesting that *li* in Serbo-Croatian is defective in the sense of not being able to support a specifier, so the focal feature of *li* may only be checked via head movement. This restriction cannot be handled by Pancheva's derivation in (2a), as the pre-clitic material is argued to be hosted in a phrasal projection, Spec, TP or Spec, CP.

Moving back to the history of Bulgarian, Pancheva observes that from the 17th c. onwards, Wackernagel clitics are replaced by preverbal clitics. The change correlates with a decline of obligatory topicalization of different categories to Spec, TP (such as the demonstrative *tova* in (2b) or the subject *tïa* in (2c)), as a result of which the clitics may not be interpreted as located in second position, hosted by a constituent in Spec, CP or Spec, TP, but rather they start to occur increasingly more frequently adjacent to the verb. In consequence, they become reanalyzed as elements generated in head positions adjoined to functional heads in the extended projection of the verb (see 4a), rather than as XP material that raises from argument positions within VP and adjoins to T^0 as a head. The clitics may be hosted low in the clause structure and are not required to occur in second position, as illustrated in (4b) for the reflexive clitic *sa*, which precedes the verb *javi*. By the 19th century this

pattern prevails and remains as the default cliticization type in Modern Bulgarian.

(4) a. $[_{TP} ...T^0...[_{XP} [_X CL\ X^0\ ] ... [_{vP} V^0\ ]]]$ (Pancheva 2005: 137)
b. i archangel Michailь pak *sa* javi Agari
and archangel Michael again REFL appeared Agara
'And Archangel Michael appeared to Agara again.'
(18th c. Bg, Pancheva 2005: 120)

1.2 Empirical Problems with Pancheva's (2005) Analysis

Pancheva's analysis offers a wealth of empirical observations covering several centuries of the history of Bulgarian, yet it also suffers from a number of shortcomings, which in my view make her postulate of T-finality untenable.

First, Pancheva's account is challenged by corresponding cliticization data from contemporary Slavic languages. It has been frequently noted in the literature that most Slavic languages with auxiliary clitics display a split regarding the position of different person forms of the auxiliary with respect to pronominal clitics. As shown in (5) for Serbo-Croatian, the 3rd person auxiliary clitic (such as *je* in (5a)) occurs to the right of the pronominal clitics, while the other auxiliary forms (such as the 1st person form *sam* in (5b)) appear to the left of pronominal clitics. If Pancheva's analysis of cliticization is adopted to account for these facts, it means that in Serbo-Croatian and the related languages TP is head-final when it is occupied by the 3rd person singular auxiliary and head-initial when it is filled in by the other auxiliary forms.

(5) a. On *mu* *ih* *je* dao
he him_{DAT} $them_{ACC}$ is_{AUX} $give_{PART.M.SG}$
'He gave them to him.'
b. Ja *sam* *mu* *ih* dao
I am_{AUX} him_{DAT} $them_{ACC}$ $give_{PART.M.SG}$
'I gave them to him.' (S-C, see Tomić 1996: 839)

Diachronically, Pancheva's claim is seriously challenged by the position of auxiliaries in the history of Bulgarian. Namely, in Old Bulgarian all auxiliary forms followed pronominal clitics (Sławski 1946), as in the pattern in (1a) above, which in Pancheva's view exemplifies a T-final

order. More examples of this type are given in (6) and at first sight they support Pancheva's analysis, as in contrast to contemporary Slavic languages, all auxiliary forms are to the right of the pronominal clitics.

(6) a. pustila *mę*$_{ACC}$ *sta*$_{AUX.2.DUAL}$ oba carě
let-go$_{PART.F.DUAL}$ me$_{ACC}$ are$_{AUX.2.DUAL}$ two tsars
'Two tsars have sent me.' (14th c. Bg)

b. tvoè zlàto što *mu*$_{DAT}$ *si*$_{AUX.2.SG}$ pròvodilь
your gold that him$_{DAT}$ are$_{AUX.2.SG}$ send$_{PART.M.SG}$
'Your gold that you have sent to him.'
(17th c. Bg, Sławski 1946: 76)

However, the auxiliary placement changed in the history of Bulgarian: in the 17–18th century the first-person, second-person, and plural third-person auxiliary forms shifted across the pronominal clitics, adopting the current distribution (Sławski 1946: 76–77), as shown in (7). Importantly, the timing of the shift poses a problem for Pancheva (2005), as it occurred when according to her analysis Bulgarian had been T-initial for several centuries, with no second position clitics left.

(7) a. deto *si* *së* javilь na mòata žena
that are$_{AUX.2SG}$ REFL appear$_{PART.M.SG}$ to my-the wife
"that you appeared to my wife" (17th c. Bg)

b. nó *sa* *gi* zváli gotïi
but are$_{AUX.3PL}$ them$_{ACC.PL}$ call$_{PART.PL}$ Goths
"but they called them Goths" (18th c. Bg, Sławski 1946: 77)

I suggest that this fact indicates that second position cliticization is unrelated to the alleged loss of T-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 Jung (2015) on the basis of Old Russian data. Jung shows that although Old Russian featured second position cliticization until the 14th century, the first and second person forms of the auxiliary rigidly followed the pronominal clitics throughout this period.

Furthermore, independently of the findings related to the position of the auxiliary and the pronominal clitics presented above, Dimitrova-Vulchanova & Vulchanov (2008: 254) point out a problem with

Pancheva's (2005) estimates of the different types of clitic placement, which may raise further doubts about the relationship between clitic placement and T-directionality. They observe that at least in *Codex Suprasliensis* clitic distribution is quite consistent and does not seem to be a matter of choice or statistical frequency. Clitics occur in second position if Spec, CP is filled, otherwise they are post-verbal. Dimitrova-Vulchanova & Vulchanov do not provide any data to substantiate this observation, but it might be the case that Spec, CP is filled in the presence of so-called operator clitics, which uniformly target second position, as has been discussed by Migdalski (2015) and Jung & Migdalski (2015). Thus, in Old Church Slavonic and Old Serbian the distribution of clitics is quite regular and category-specific. Pronominal clitics are verb-adjacent, whereas operator clitics, which specify the Illocutionary Force of a clause and include the emphatic particles *li* and *že*, the complementizer *bo*, and ethical datives occur exclusively in second position (see Radanović-Kocić 1988), as shown in (8).

(8) a *by* *bo* ne molilъ *sę*
if $COND_{3SG}$ because not $pray_{PART.M.SG}$ REFL
'For if he had not prayed...'
(OCS, *Codex Suprasliensis* 303–12–13, Willis 2000: 335)

This type of operator clitic placement has been preserved across Modern Slavic, and these clitics always target second position irrespective of a cliticization type observed in a language. Pronominal clitics shifted to second position in some Slavic languages. The shift has been shown in Migdalski (2015) and Jung & Migdalski (2015) to be contemporaneous with the loss of tense morphology. For instance, it occurred very early in Slovenian, and only around the 19th century in the dialects spoken in Montenegro.

2 The Position of Negation in Old Church Slavonic

In her later work, Pancheva (2008) provides additional diagnostics to determine the head directionality of T^0 in Old Church Slavonic. The first one is related to the position of negation in complex tenses.

2.1 The Position of Negation in Complex Tenses

Negation may attract and incorporate into verbs in Modern Slavic, as a result of which the two elements then form a single prosodic word. Pancheva (2008) shows that in Old Church Slavonic negation may attract finite verbs (see 9a; including the auxiliary; see 9b) and, in some cases, also the *l*-participle (see 9c), in contrast with Modern Bulgarian.

(9) a. *ne* ostavitъ li devęti desętъ i devęti
NEG leaves Q nine ten and nine
vъ pustyni (OCS, *Luke* 15.4)
in wilderness
'Does he not leave the ninety-nine in the wilderness?'

b. sego avraamъ *něstъ* sъtvorilъ
this Abraham NEG+is$_{AUX}$ do$_{PART.M.SG}$
'Abraham did not do this' (OCS, *John* 8.40)

c. *ne* moglъ bi tvoriti ničesože
NEG can$_{PART.M.SG}$ be$_{COND.3SG}$ do$_{INF}$ nothing
'He couldn't do anything.' (*John* 9.33, Pancheva 2008)

Pancheva postulates that NegP is located above TP in Old Church Slavonic. The fact that negation may attract the *l*-participle and that as a result the negation–participle–auxiliary order is available is taken by her to be indicative of a potential T-final structure. In her view, such a structure can also be posited for negation–auxiliary–participle orderings on the assumption that negation attracts the auxiliary across the participle. More generally, since both negation–participle and negation–auxiliary orders are available, Pancheva claims that it is likely that there are two grammars (T-final and T-initial) that are in competition in Old Church Slavonic.

2.2 The Position of Negation is Unrelated to Grammar Competition

I observe that some diachronic facts indicate that the position of negation is unlikely to be related to grammar competition. First, there are remarkable frequency contrasts between the two types of negation placements, which seem to be contextually dependent and not a result of statistical frequency. For instance, Večerka (1989: 34, quoted in Willis 2000: 328) states that the negation–auxiliary pattern is four times as frequent as the negation–participle order. Correspondingly, Willis (2000:

329) points out that the auxiliary–negation–participle order is unattested in main clauses, which is unexpected if the variation is due to grammar competition. Furthermore, in subordinate clauses the order may depend on the semantics of the complementizer. Thus, Willis (2000: 330) points out that in Old Church Slavonic complementizers could attract the conditional auxiliary *bi*. The attraction was obligatory in the case of complementizer *a* (see 10), which introduced conditional clauses, but not in the case of *da* (see 11), which introduced indicative clauses.

(10) a. A *by* bylъ sьde
if $COND_{3SG}$ $be_{PART.M.SG}$ here
'If he had been here...'
b. A *by* sьde bylъ
c. A *by* bylъ prorokъ
if $COND_{3SG}$ $be_{PART.M.SG}$ prophet
'If he had been the prophet' (OCS, Vaillant 1977: 219)

(11) a. Drъžaaxõ *i* da ne *bi* otъšelъ
$held_{3PL}$ him that NEG $COND_{3SG}$ $leave_{PART.M.SG}$
otъ nixъ
from them (OCS, *Codex Marianus*, Willis 2000: 330)
b. Drъžaaxõ *i* da *bi* ne otъšlъ
$held_{3PL}$ him that $COND_{3SG}$ NEG $leave_{PART.M.SG}$
otъ nixъ
from them (OCS, *Codex Zographensis*, Willis 2000: 330)
'And they held him, so that he would not leave them.'

Thus, it can be assumed that in subordinate clauses introduced by the complementizer *a*, there will be no cases of negation–auxiliary orders, and only the negation–participle pattern will be attested. Such a contextual restriction is surprising if the variation is due to grammar competition. It seems that at least in the contexts presented in (10) and (11), the position of negation with respect to the participles is determined by a syntactic mechanism, which in specific environments is obligatory.

Furthermore, empirical facts from contemporary Slavic languages also indicate that the position of negation with respect to the verb cannot be related to the alleged directionality of T^0. First, there are languages such as Polish, which is clearly T-initial, but in which negation either

precedes the auxiliary or the participle depending on the type of the auxiliary involved. For instance, negation adjoins to the future auxiliary (which morphologically is the perfective form of the verb "to be"), as in (12), but it may not adjoin to the perfect auxiliary, and then it attracts the *l*-participle instead, as shown in (13).

(12) a. Nie będziesz parkował tutaj samochodu
NEG be$_{PERF.1SG}$ park$_{PART.M.SG}$ here car
'You won't park your car here.'
b. *Nie parkował będziesz tutaj samochodu (Pl)

(13) a. Nie parkowali-śmy tutaj samochodu
NEG park$_{PART.M.PL}$+AUX$_{1PL}$ here car
'We didn't park the car here.'
b. *Nie-śmy parkowali tutaj samochodu (Pl)

Second, in Czech, which is also a T-initial language, negation is adjoined to the *l*-participle, and it may not be adjoined to the auxiliary "to be." However, negation adjoins to the verb "to be" when it is used as a copula. The contrast is presented in (14) and (15).

(14) a. Přišel jsi
come$_{PART.M.SG}$ are$_{AUX2.SG}$
"You have come"
b. Nepřišel jsi
NEG+come$_{PART.M.SG}$ are$_{AUX2.SG}$
'You haven't come.'
c. *Nejsi přišel
NEG+are$_{AUX2.SG}$ come$_{PART.M.SG}$ (Cz, Toman 1980)

(15) a. Jsi hlupák / zdráv / na řadě
are$_{2SG}$ idiot / healthy / on row
'You are an idiot/healthy/next in line.'
b. Nejsi hlupák / zdráv / na řadě
NEG+are$_{2SG}$ idiot / healthy / on row
'You are not an idiot/healthy/next in line.'
c. *Jsi nehlupák/nezdráv/nena řadě (Cz, Toman 1980)

In the case of Czech, auxiliaries and copula verbs are morphologically the same (except for the fact that the auxiliary is null whereas the copula is overt in the 3rd person singular and plural), so the placement of negation is evidently related to the categorial distinction between these two types of verbs. It is not contingent on the directionality of T^0, and there is no grammar competition involved in this case.

3 Participle-auxiliary orders in Old Church Slavonic

The second diagnostic used by Pancheva (2008) to determine the head directionality of T^0 in Old Church Slavonic is related to the distribution of the *l*-participle with the auxiliary "be".

3.1 Participle Fronting in Old Church Slavonic

Pancheva (2008) reports that both auxiliary–participle and participle–auxiliary orders are available in Old Church Slavonic, as shown in (16).

(16) a. iže bĕaxŏ prišъli otъ vьsĕkoję vьsi
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 ošъli bĕaxõ vъ gradъ
disciples for his go$_{PART.PL}$ be$_{PAST.3PL}$ in town
'Because his disciples had gone to the town.'
(OCS, *John* 4.8, Pancheva 2008)

Corresponding cases of participle fronting are found in Modern Slavic, and they have received considerable attention in the literature since Lema & Rivero's (1989) analysis of the operation in terms of Long Head Movement, which in their view consists in raising of the *l*-participle from V^0 to C^0 in spite of the auxiliary being present in I^0, as illustrated for Modern Bulgarian in (17), with a derivation of the fronting given in (18).

(17) a. Az sŭm čel knigata
I am$_{AUX}$ read$_{PART.M.SG}$ book-the

b. Čel sŭm knigata
read$_{PART.M.SG}$ am$_{AUX}$ book-the
'I have read the book.' (Bg)

(18) $[_{CP}\ [_{C}Part_i]\ [_{IP}\ Aux\ [_{VP}\ [_{V}\ t_i]\ DP]]]$

The movement has also been analyzed as an instance of head adjunction of the participle to C^0 (Wilder & Ćavar 1994), to Aux^0 (Bošković 1997), or to a discourse-related focus projection $Delta^0$ (Lambova 2003). In my previous work (Broekhuis & Migdalski 2003; Migdalski 2006) I proposed that the operation is a case of predicate inversion and that it involves remnant movement of the *l*-participle to Spec, TP. The XP-movement proposal explains a number of properties that had been unaccounted for previously, such as the requirement of a subject gap when the participle is preposed or the dependency of the operation on the auxiliary "be" and the agreement between the subject and the participle.

In her diachronic account, Pancheva (2008) admits that the structure in (16) could instantiate a case of participle fronting found in Modern Slavic, as has been argued for Old Church Slavonic by Willis (2000: 325–327). She also observes that the movement analysis is empirically supported by the fact that the participle–auxiliary orders contain VP-elements following the auxiliary, such as *vъ gradъ* 'in town' in (16b), which may indicate that these elements have been evacuated out of the moved phrase headed by the participle. This seems also to be the most economical derivation; moreover, it underlyingly exemplifies a T-initial structure, given that the participle moves to the left. However, Pancheva (2008) points out that it is also possible to posit a T-final interpretation of such data, but in such a scenario the VP-internal elements would be extraposed out of VP to a position higher and to the right of the auxiliary. If a T-final analysis is assumed, the pattern presented in (16b) would be the basic one, and the auxiliary–participle order in (16a) could be derived via rightward participle movement. This assumption would mean that the structure of Old Church Slavonic paralleled the structure of Old English (at least on Pintzuk's 1999 analysis), which is assumed to be T-final, and the auxiliary–participle orders are attributed to verb raising.

Pancheva (2008) observes that both orders, with the participle preceding or following the auxiliary, are optional as long as the auxiliary verb is not a clitic. Therefore, in order to limit a potential influence of the prosodic requirements of the clitic on the word patterns, she restricts her study to the cases involving the past tense auxiliary, which has an orthotonic, non-clitic form. Furthermore, she assumes that the word order that arises as a result of an optional operation will be statistically less

frequent than the pattern that reflects the underlying order. Hence, she carries out a quantitative study of both orders, which in her view may be helpful in determining the directionality of T^0 in Old Church Slavonic.

The results of her study indicate that in the Old Church Slavonic relics she has investigated both orders occur in a balanced proportion, though the participle–auxiliary pattern is slightly less common than the auxiliary–participle pattern: 41% versus 59%. Significantly, the results are very different in Modern Bulgarian, in which according to Pancheva's statistics, the auxiliary–participle order is considerably more frequent and constitutes 97% of the corpus data, versus 3% of the participle–auxiliary cases. Modern Bulgarian is clearly a T-initial language, and the infrequent, optional auxiliary-final order is a result of participle fronting. In Pancheva's view, the contrast in the availability of the two structures across the centuries indicates that Old Church Slavonic was a T-final language. In addition, she observes that there was a different rate of participle–auxiliary orders depending on whether an active or passive participle was involved. Namely, in *Codex Marianus* active participles occur in front of the auxiliary in 16% of the cases, whereas passive participles precede the auxiliary at a much higher rate, in as many as 67% of the cases. In Modern Bulgarian the rate is not that high. In Pancheva's view, this contrast gives support to the hypothesis that suggests that two grammars (T-final versus T-initial) are in competition. As has been argued by Kroch (1989), a diachronic change may be observed in some syntactic contexts earlier than in others, and this variation may be manifested through different ratios of the outputs produced by the new and the old grammars at a particular point in time. In the case of the language change investigated by Pancheva, it is plausible that the switch in the setting of the T-head parameter was initiated among active participles, which resulted in a higher rate of the participle–auxiliary orders among them.

Pancheva makes use of two additional pieces of argumentation to support her analysis, which in my view are problematic. First, she admits that rather than due to the switch in the setting of the T-head parameter, the different ratios of the participle/auxiliary orders may have arisen across centuries because of different discourse factors that are reflected through these two patterns. Thus, it might be the case that a particular discourse context started or ceased to be expressed through participle movement at a certain point in the language history. Yet, Pancheva

rejects this possibility, pointing to the different ratios between active and passive participles preceding the auxiliary, which according to her remain unexplained if discourse factors were involved in the change.

3.2 Participle-auxiliary orders in Modern Slavic

In Modern Bulgarian participle fronting may trigger different discourse conditions, which in Pancheva's view are not well understood. They have been studied by Lambova (2003), who observes that participle movement may have different semantic import depending on whether it occurs across the present perfect auxiliary clitic (see 19a below as well as 17b above) or the orthotonic past perfect auxiliary, as in (19b). Since the auxiliary in (19a) is prosodically deficient and needs support to its left, the movement of the participle (or any other element to the position in front of the clitic) is obligatory. Conversely, movement of the participle across the non-clitic auxiliary, as in (19b), is optional. As has been mentioned above, in order to avoid a potential influence of the clitic prosodic requirement on word order permutations, Pancheva decides to restrict her diachronic study to the patterns involving participle fronting across the past tense auxiliary, thus the ones corresponding to (19b).

(19) a. Gledali *sa* filma
watch$_{PART.PL}$ are$_{AUX.3PL}$ movie-the
'They have watched the movie.'

a'. **Sa* gledali filma

b. Gledali bjaxa filma
watch$_{PART.PL}$ were$_{AUX.3PL}$ movie-the
'They had WATCHED the movie.'

b'. Bjaxa gledali filma
'They had watched the movie.' (Bg, Lambova 2003: 111)

According to Lambova (2003), in contrast to the movement illustrated in (19a), the operation exemplified in (19b) always produces detectable semantic effects and is perceived as "marked." This fact is reflected in the translation of (19b), where the main verb is capitalized to show a focused interpretation. In Lambova's (2003: 113) view, participle fronting across the past tense auxiliary is felicitous when "the speaker is presenting the activity under discussion as an alternative." For instance, (19b) can be used in a situation in which "the discourse contains either

explicit or implied reference to the movie being in possession, i.e. rented or owned." (Lambova 2003: 113). 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, which is typical of contrastively focused elements in Bulgarian. All these properties lead Lambova to propose that when the participle raises across the past tense auxiliary, it targets a higher projection than it does during the movement across the auxiliary clitic. She refers to this projection as Delta Phrase and assumes it licenses focus, located above CP.

Given that participle movement across the past tense auxiliary requires a special discourse context in Modern Bulgarian, it is not surprising that it is not often found in the corpus examined by Pancheva. Yet, a question that arises is whether the same discourse requirement held in Old Church Slavonic. It is plausible that it did not. In fact, Pancheva (2005) refers to a discourse-related syntactic change that occurred in Bulgarian between the 17th and the 19th centuries, which consisted in the loss of obligatory topicalization targeting Spec, TP (see the examples of topicalization in (2b and c), and which she reports was accompanied by a shift of Wackernagel pronominal clitics to the preverbal position. Although the Bulgarian data from that period provided by Pancheva (2005: 153–154) contains adverbials and objects in the topic position, it could be the case that Spec, TP was also typically filled by participles, as independently argued for Modern Bulgarian in Broekhuis and Migdalski (2003) and Migdalski (2006).

Another property that Pancheva's (2008) analysis does not pay attention to is the fact that the discrepancy in the ratio of participle fronting between Old Church Slavonic and Modern Bulgarian is not the only frequency contrast that can be observed between the two languages with respect to the syntax of participles. It has also been noted in the literature that compound tense structures formed with the auxiliary "to be" and the *l*-participle were in general considerably less frequent in Old Church Slavonic than they are in the present-day South Slavic languages. For instance, Dostál's (1954: 599ff.) statistics show that in Old Church Slavonic the perfect tense was used sporadically, and usually in subordinate clauses. In his corpus study Dostál attests 10 thousand usages of the aorist, 2300 of the imperfect tense, and approximately 600 of perfect tenses (that is, approximately 5% of all the tense forms). A number of potential explanations of this discrepancy have been given in

the literature (see Migdalski 2006: 26–27 for a discussion); for example, Damborský (1967) points out that in the earliest stages of Slavic, the *l*-participle was an innovation and was not widely used; it became more common in later Old Church Slavonic manuscripts, such as *Codex Suprasliensis* and *Savvina kniga* (both from the 11th century; see Bartula 1981: 100). Consequently, structures with the *l*-participle may have been too novel and too innovative to be appropriate for biblical texts. Regardless of an actual reason for the sporadic usage of the complex tense forms, the fact that they are found less often in Old Church Slavonic than in the contemporary corpora of Slavic languages may have repercussions for the different ratios in the participle–auxiliary orders studied by Pancheva (2008).

The final argument used by Pancheva (2008) against the hypothesis of discourse factors being responsible for the different ratios of participle–auxiliary patterns in the history of Slavic is based on her observation that, as shown by the quantitative data in Kroch and Taylor (2000: 138), participle fronting constitutes 2–8% of all clauses in Early Middle English, which is a much lower ratio than in Old Church Slavonic. However, this observation does not seem to me to bear much relation to the nature of participle movement in Slavic as it is quite a different operation than participle movement found in the Germanic languages. First, both Old Slavic and the contemporary Slavic languages make use of a special type of complex tenses that is not found in the Germanic or Romance languages. Namely, complex tenses in Slavic are formed with the verb "to be" that functions as the exclusive auxiliary and the so-called *l*-participle, which agrees with the subject of a clause in gender and number and is a designated participial form used in complex tenses. In the Germanic and Romance languages complex tenses are constructed with either the verb "to be" or "to have" used as the auxiliary, which is accompanied by the participle that is morphologically the same as the passive participle. In Modern Slavic, such structures are found only in Kashubian and Macedonian (along with the typical complex tenses formed with the *l*-participle), and they are innovations that are not attested in Old Church Slavonic. Second, participle fronting displays different properties in the Slavic and the Germanic languages. A striking peculiarity of participle movement in Slavic that has received much attention in the literature is the fact that the participle may be raised entirely on its own, and it may not pied-pipe any other material,

such as an object or an adverb. This restriction is exemplified in (20) for Bulgarian.

(20) a. Pročel *e* knigata
read$_{PART.M.SG}$ is$_{AUX}$ book-the
'He has read the book.'
b. *Bŭrzo pročel *e* knigata
quickly read$_{PART.M.SG}$ is$_{AUX}$ book-the
c. *Pročel knigata *e* (Bg, Migdalski 2006: 138)

The pied-piping restriction is not observed in the case of participle fronting across the auxiliary "have" in the Germanic languages such as Dutch and German (see Den Besten and Webelhuth 1987). Thus, as shown in (21), the past participle in Dutch may be fronted entirely on its own (see 21b); it may pied-pipe the direct object (see 21c) or even a VP-external constituent, such as the VP-adverb *te snel* 'too quickly' in (21d).

(21) a. Jan heeft het boek$_i$ niet [$_{VP}$ t$_i$ gelezen]
Jan has the book not read
b. [$_{VP}$ gelezen] heeft Jan het boek niet t$_{VP}$
c. [$_{VP}$ het boek gelezen] heeft Jan niet t$_{VP}$
d. [dat boek te snel gelezen]$_i$ [$_C$ heeft hij niet t$_i$]]
that book too quickly read has he not
(Dutch, Migdalski 2006: 141)

A related type of participle fronting to the one found in the Germanic languages is attested within Slavic in only two languages, Kashubian and Macedonian (see Migdalski 2006 ch. 3 for an extensive discussion and Tomić 1996, 2012 for an overview of the Macedonian data). As shown in the Macedonian examples in (22), in contrast to the *l*-participle in (20), which shows subject agreement, the past participle is morphologically invariant and does not agree with the subject or the object. It can be fronted across the auxiliary "have" either on its own (see 22a), together with the direct object (as in 22b), or an adverb (as in 22c). This type of fronting is not found in Old Church Slavonic. Significantly, as indicated by the translations of these examples, in all of them the fronted element is interpreted as topicalized or contrastively focused, which is not

necessarily the case with *l*-participle fronting occurring across the auxiliary "be."

(22) a Kupeno gi imame knigite
buy$_{PTP.N.SG}$ them$_{CL.ACC}$ have$_{1PL}$ books-the
'We did buy the books!'

b. Brzo pročitano gi imame knigite
quickly read$_{PTP.N.SG}$ them$_{CL.ACC}$ have$_{1PL}$ books-the
'We have read the books really quickly.'

c. Kupeno knigite (nie) gi imame
buy$_{PTP.N}$ books-the we them$_{CL.ACC}$ have$_{1PL}$
'Buy the books, we did!' (Mac, Migdalski 2006: 137–138)

All these data exemplifying the two types of participle fronting provided above suggest that these operations do not proceed in a uniform fashion and that they exhibit their own characteristics, for instance related to the question of whether any additional material can be fronted together with the respective participle or to the discourse or semantic import of the preposed material. Therefore, it does not seem correct to draw conclusions about syntactic properties of these operations solely on the basis of the ratio of their occurrence in language history. It seems also misguided to compare ratios of participle movement in different language groups when they involve different syntactic mechanisms.

4 Conclusion

This paper has overviewed empirical arguments that have been put forward in support of the hypothesis of T-finality in Old Church Slavonic and Old Bulgarian. I have shown that these arguments give wrong predictions when they are applied to the corresponding structures in Modern Slavic. Moreover, they are also challenged by diachronic developments, especially those related to the change in the position of different auxiliary forms with respect to pronominal clitics in the history of Bulgarian and the placement of negation and auxiliaries in subordinate clauses introduced by different complementizers in Old Church Slavonic.

Due to space limitation, I focused only on Pancheva's analysis (2005, 2008), and I was not able to address Dimitrova-Vulchanova & Vulchanov's (2008) account, who posit that Old Church Slavonic was

X^0-final in the VP-domain but X^0-initial in the CP-domain. Their proposal of X^0-finality in the VP-domain is motivated by their observation of frequent topicalizations that produce verb-final orders (see 2c) , though they do not exclude the possibility of Old Church Slavonic being head-initial in the VP domain, with verb-final patterns being the result of movement of objects and other elements across the verb.

It has been observed in the literature that head-final languages display many syntactic properties that are not found in head-initial languages; for instance, more robust scrambling possibilities. In view of the empirical problems that follow from the proposal of T^0/head-finality of Old Church Slavonic, I suggest that it is a safer alternative to assume that Old Church Slavonic was head-initial on a par with Modern Slavic unless substantial evidence for T^0/head-finality has been found.

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The Structure of Coordination: Evidence from Croatian Church Slavonic*

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1 Introduction

There are, at the moment, two major approaches to the structure of coordination. The first treats the coordinator as the head, the second conjunct as the complement and the first conjunct as the specifier of that head. Earlier versions of this approach assume a category &P (alternatively ConjP), i.e. they assume the following structure for coordination (Zoerner 1995, Johannessen 1998, Progovac 1998, among others):

(1) $[_{\&P}$ XP $[_{\&'}$ & YP]]

Since the notion of &P has been repeatedly criticized (Borsley 2005, Zhang 2010: 60-65), some newer versions of this approach do not assume its existence, but propose that the coordinator is a head without categorial features, and that it gets these features via Spec–head agreement from the first conjunct (Zhang 2010).

According to the second approach the coordinator and the second conjunct are adjoined to the first conjunct, which is the head of the whole coordination (Munn 1993, Larson 2010, Prażmowska 2013, among others). Here we also have two possibilities. The first is that the

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coordinator is the head of a maximal projection which it forms together with the second conjunct (Prażmowska 2013: 203), i.e. something like:

(2) $[_{XP}$ XP $[_{\&P}$ & YP]]

The second is that the coordinator is not a head at all, but some kind of adverb which is adjoined to the second conjunct:[1]

(3) $[_{XP}$ XP $[_{YP}$ & YP]]

I think the adjunction approach is more appropriate for languages with multifunctional conjunctions, i.e. in which the same word can be both a conjunction and a particle. The adjunction approach lets us treat them in a uniform manner as manifestations of the same lexeme, while in the first approach the conjunction and the particle must be treated separately, and all similarities between them are accidental. In this paper I present some facts from Croatian Church Slavonic (CCS) which support the adjunction approach. CCS is a literary language which was in use in the coastal part of Croatia during the Middle Ages, mostly in liturgy.[2] Like other recensions of Church Slavonic, it never had native speakers.[3] CCS has the following conjunctions: 1. coordinate: *i*, *ni* and *toli*, 2. disjunctive: *ili*, *lûbo* and *vola*, 3. adversative: *a*,[4] *nь* and *ali* and 4. explicative: *ibo*. All of them, except probably *toli*, function both as conjunctions and as particles of some kind. In what follows the focus will be on the coordinate conjunction/particle *i* which can function both as a conjunction and as an additive (focus) particle similar to English *also* and *even*. I shall assume that, if not proved differently, in both

[1] That coordinators are adjuncts was proposed by Friederike Moltmann (1992: 52).

[2] Often also called the Croatian recension of Church Slavonic.

[3] For more about CCS see in Mihaljević and Reinhart (2005) and Gadžieva et. al. (2014).

[4] Strictly speaking, *a* is a contrastive conjunction. Because of that, it can be used not only in adversative sentences, but sometimes also in coordinate ones as well. The other two conjunctions, *nь* and *ali*, are really adversative.

functions *i* represents the same lexeme.[5] That is, following Occam's razor, it is not the approach which treats them uniformly that needs justification. It is the approach which separates them as different lexemes that should be justified.

2 Coordinate Conjunction *i*

As mentioned in the *Introduction*, the conjunction/particle *i* in CCS has different functions. The first function is that of a coordinate conjunction. Like English *and*, the CCS coordinate conjunction *i* can connect phrases of all syntactic categories:[6]

(4) a. počto s mitari **i** grêšniki učitel' vaš' êst'[7]
why with publicans and sinners teacher your eats
'Why eateth your Master with publicans and sinners?'[8] (Mt 9,11)

b. o nesmislьna **i** lêna sr'cem'
o foolish and slow heart$_{INSTR}$

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[5] Dictionaries of Slavic languages differ in their treatment of the conjunction and the particle *i*. Some analyse them under the same lexical entry, while others treat them as homonyms, i.e. under different entries. This also holds for dictionaries of modern Croatian. So for example, the dictionary compiled in 1901 by Fran Iveković and Ivan Broz and the dictionary compiled in 1991 by Vladimir Anić analyse them under the same entry, while the 2000 dictionary of the Leksikografski zavod Miroslav Krleža and Školska knjiga, as well as the 2012 *Školski riječnik hrvatskoga jezika* published by the Institut za hrvatski jezik i jezikoslovlje and Školska knjiga, separate them into two entries. About a similar situation in Russian linguistics see Uryson (2000: 97).

[6] The same also holds for *ni* and *toli*, as well as for disjunctive conjunctions *ili*, *vola* and *lûbo*. In the first approach, according to Zhang (2010:43), this means that they do not have any categorial features intrinsically.

[7] Examples are transliterated in accordance with recent publications of the Staroslavenski institut in Zagreb. In CCS there is only one *jer* letter, transcribed *ь*, but there is also an apostrophe-like sign here written *'*. The letter *ĉ* has most often the value of *ć*, but it can also represent *šć*, *ščˇ* or *št*; *ê* has the value of *ě* or *ja* (after a vowel); *û* is *ju*.

[8] In order to retain the archaic flavour, English translations of biblical examples are taken from the King James Version (edition published in 1994 by Diamond Books).

'O fools and slow of heart ...' (L 24,25)

c. po straš'nih **i** božastvênihь čudesihь
after tremendous and divine miracles
'After tremendous and divine miracles'

d. nam' iže êhom' **i** pihom' s nimь
us$_{DAT}$ who ate and drank with him
'to us, who did eat and drink with him' (Acts 10,41)

e. iduĉim' že imь kupiti **i** abie pride
going$_{DAT.P}$ indeed them buy and immediately came
ženihь
bridegroom
'And while they went to buy, the bridegroom came' (Mt 25,10)

f. anno počto plačeši se **i** počto ne êsi
Hannah why weepest$_{REFL}$ and why not eatest
'Hannah, why weepest thou? and why eatest thou not?'
(1Sam1,8)

g. semr'tь **i** životь položenь e(stь) t(e)bê
death$_{NOM.F.SG.}$ and life$_{NOM.M.SG.}$ set$_{NOM.M.SG.}$ is you$_{DAT.SG.}$
'Death and life are set before you'
Lat. Mors et vita apposita sunt tibi

The example (4g) is also interesting because it shows that CCS allows last-conjunct agreement in preverbal contexts, which is, according to Marušić, Nevins and Saksida (2007: 212), much rarer than first-conjunct agreement. The masculine passive participle form *položenь* agrees in gender[9] with the second conjunct *životь*, and not with the first conjunct *semr'tь*, which belongs to the feminine gender. As can be seen, CCS differs here from Latin, which shows plural agreement with both conjuncts.

In contrast to the coordinator *toli*, which can occur only once in the structure, *i* can be repeated an unlimited number of times:[10]

[9] As well as in case and number, but this is not relevant here since the first conjunct also has the same case and number.

[10] The same is also characteristic for *ni*, *ili*, *vola* and *lûbo*.

(5) a. vze oltarь zlati **i** svêtilniki svêčь **i** vse
carried off altar golden and lamp stand and all
s'sudi ego **i** trьpezu prêdloženiê **i** žrьtvi **i**
vessels its and table Presence and offering and
rizi **i** sasudi zlatie **i** pokrovь **i** krune **i**
clothes and plates golden and cover and crowns and
naredbu zlatu
plating golden
'He ... carried off the golden altar, the lamp-stand with all its equipment, the table for the Bread of the Presence, the sacred cups and bowls, the golden censers, the curtain and the crowns.' (1Macc 1,23)

b. vinograd' stvorih' **i** sьzdah' stlьpь posrêdê ego **i**
vineyard created and built tower in the midst of it and
točilo iskopahь v nem'
winepress dug out in it
'I planted a vineyard, and built a tower in the midst of it, and made a winepress therein' (Cf. Is 5,2)

In polysyndeton[11] only one occurrence of *i* can be replaced by *toli*. It is usually the last one:

(6) i vprašati vьčnut' istukannih' **i** svêtnik' svoih' **i**
and inquire begin idols and councillors their and
vlьhvь svoih' **toli** vražitel'
charmers their and wizards
'... and they shall seek to the idols, and to the charmers, and to them that have familiar spirits and to the wizards.' (Is 19,3)

If it replaces any other occurrence of *i* (but the first), *toli* always breaks the sequence into two parts. This means that the coordination in the example

[11] The term polysyndeton denotes the use of a conjunction before all, or all but the first, of a string of three or more conjuncts. The opposite term is asyndeton. Asyndeton uses no conjunctions, but commas.

(7) dêlateli že vistinu godini prьvie **i** tretoe **toli**
labourers however really hour first and third and
šestoe **i** devetoe
sixth and ninth
'However, the labourers of the first and the third and the sixth and the ninth hour ...'

must be interpreted as in

(8) [[prьvie **i** tretoe] [**toli** [šestoe **i** devetoe]]].

Unlike English *and*, *i* can also occur in front of the first conjunct, in what is termed initial (correlative) coordination:

(9) a. da naslêduûče zap(o)v(ê)di tvoe **i** voleû tebê
that following orders your and $will_{INSTR}$ you_{DAT}
i dêêniem' ugodili bihom'
and $deed_{INSTR}$ pleased be_{AOR1PL}
'That we could, following your orders, please you, both in will and deeds.'

b. g(ospod)i s toboju gotovь esm' **i** v tьmnicu **i**
Lord with you ready am and in prison and
v semr't' iti
in death go
'Lord, I am ready to go with thee, both into prison and to death.' (L 22,33)

c. opet vzdaite **i** kukule **i** sukne
again $give_{IMP2PL}$ and hoods and tunics
'you give (them) again both hoods and tunics'

Examples (9) create a problem for the first approach. It is generally accepted that the category of the whole coordination is identical to one of the conjuncts. In the case of English *and* and the CCS coordinator *i* it is usually the first conjunct. To explain this fact, Zhang (2010) proposes that in such cases a coordinator has no categorial feature and that it gets this feature via Spec–head agreement from the first conjunct. The categorial feature (and probably some other features) percolates from the first conjunct onto the coordinator and from there onto the whole

coordinate complex. However, in examples (9) there is no specifier in front of the first *i*, and the categorial status of the whole complex must be determined by the phrase following *i*. If we want to avoid the same category getting its categorial feature once from its specifier and the next time from its complement, the only solution is to assume the existence of two *i*'s, one of which is a coordinator and the other some kind of correlative adverb similar to English *both*.[12] However, *i* behaves differently from correlatives such as English *both*, *either* and *neither*. According to Johannesen (2005: 420) "each correlative is associated with only one conjunction", which is not the case with CCS initial *i*, *ni*, *ili*, *vola* and *lûbo*. They can be followed by structures with two or more conjunctions:

(10) Vsa bo vaša sut' lûbo pavlь lûbo apolos' lûbo kifa
all for yours are or Paul or Apolos or Cephas
lûbo mir' lûbo žizьn' lûbo semrьt' lûbo suča lûbo
or world or life or death or present or
buduča
future
'For all things are yours, whether Paul, or Apolos, or Cephas, or the world, or life, or death or things present or things to come.' (1C 3,21-22)

Correlative coordinations with *both*, *either* and *neither* have different structure than those with *i*. *Both* scopes over both conjuncts and has *and* in its scope. We can say that *both* selects for a coordinated phrase. On the other hand, CCS initial *i* scopes only over the first conjunct and does not have the second *i* in its scope, which means that it does not select for a coordinated phrase. This suggests that the structure of *both hoods and tunics* from the example (9c) looks like (11a) (cf. Johannesen 2005:421), while the CCS phrase *i kukule i sukne* has the structure in (11b).[13]

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[12] In that case *ni* would correspond to *neither* and *li*, *vola* and *lûbo* to *either*.

[13] In modern Croatian we can have two *i*'s with the structure corresponding to (11a). It is reasonable to assume that the same was also possible in CCS. However, this structure has different interpretation and different prosody than (11b). The two conjuncts form a single intonation unit and there is no break between them. Interpretation of the first *i* in that case does not correspond to

(11) a. [both [hoods and tunics]]
b. [[i kukule][i sukne]]

Correlatives such as English *both*, *either* and *neither* "can be displaced from the conjunction phrase" (Johannesen 2005:420), which is not the case with CCS *i*, *ni*, *ili*, *vola* and *lûbo*. I haven't found any such example in the corpus.[14] In short, it seems that there is no difference between the first and the second *i* in (9). This is probably the reason why even the dictionaries that analyse conjunction and particle *i* under different lexical entries treat the first *i* in such examples as a conjunction.

3 Particle *i*

The second function of *i* is that of an (additive) particle. Here, traditionally, three subcases are differentiated: a) discourse particle (Lat. particula adiunctiva), b) focus particle (Lat. particula elativa) and c) interjectional/affective particle (Lat. particula interiectionalis et affectiva).

a) Like English *and*, *i* can be sentence-initial, but also chapter- or even text-initial:[15]

English *both*, but to *also* or *even*. In other words, *i* is not a correlator, but only a focus particle. Moreover, the example (9c) with such structure has the presupposition that you have to give them again not only hoods and tunics, but something else as well, which is not the case in (11a) or (11b).

[14] To prove that the displacement of *i* is impossible, we would need, as pointed out by an anonymous reader, ungrammatical examples, but we couldn't obtain judgements on such examples since the language never had native speakers. However, I think that the fact that among thousands of examples there is not one with *i* displaced from the first conjunct allows us to draw such a conclusion. The fact that the same holds for *lûbo* and *vola* shows that its clitic nature cannot be the reason why *i* cannot be displaced from the following element, as suggested by the same reader. *Lûbo* and *vola* are surely not clitics, and there is still no example in the corpus in which they are displaced from the first conjunct.

[15] The same also holds for *ni*, *a*, *ibo* and *ili*. *Ili* can be sentence-initial only in interrogatives.

(12) a. **i** bistь sl(o)vo g(ospod)ne ka iûnê amatiinu
and was word Lord's to Jonah Amitai's
'Now the word of the Lord came unto Jonah the son of Amitai' (Jon 1,1)

b. **i** otveča g(ospod)ь i reče kь mnê
and answered Lord and said to me
'And the Lord answered me, and said ...'

c. g(lago)la otstupête nêst' mrьtva d(ê)vica na spitь
said step-aside not-is dead maid but sleeps
i rugahu se emu
and ridiculed REFL. him
'He said unto them, Give place: for the maid is not dead, but sleepeth. And they laughed him to scorn.' (Mt 9,24)

d. i potomь otь s(ve)tihь a(ntifo)nь
and after-that of $\text{saints}_{\text{GEN}}$ $\text{antiphon}_{\text{NOM.SG.M.}}$
'And after that the antiphon of saints'

In such cases *i* evidently has the role of a discourse connective. It connects adjacent structurally independent sentences or greater text chunks. In this function it can also be used polysyndetically (for example in Is 22,19-24). Sometimes it is impossible to distinguish this function of *i* from that of an intra-sentence coordinator, i.e. it is not easy to say whether we are dealing with one sentence structure or with a sequence of two independent sentences. If we, for example, compare the text from the *Book of Isaiah* (5,2) which follows immediately after the example (6b), we'll see differences in punctuation between the two following versions:[16]

(13) a. Vinograd' stvorih' i sьzdah' stlьpь posrêdê ego i točilo iskopahь v nem' · I poždahь da stvorit' grozdi i stvori trьnie

a'. Vinogradь stvorihь i sazdahь stlpь posrêdê ego i točilo iskopah' v nemь i poždahь da stvoritь groz'di i stvori e tr'nie Lat. ... plantavit eam electam; et aedificavit turrim in medio eius, et torcular extruxit in ea; et exspectavit ut faceret uvas, et fecit labruscas. (Vulgata – Rome 1955)

[16] Capital letters are in the manuscripts written in red ink.

... plantavit eam electam et aedificavit turrim in medio eius et torcular extruxit in ea et exspectavit ut faceret uvas et fecit labruscas (Vulgata – Stuttgart 1969)
Eng. ... planted it with the choicest vine, and built a tower in the midst of it, and also made a winepress therein: and he looked that it should bring forth grapes, and it brought forth wild grapes. (King James Version)
... planted it with red vines; he built a watch-tower in the middle and then hewed out a winepress in it. He looked for it to yield grapes, but it yielded wild grapes. (The New English Bible – Penguin books 1970)

The first CCS version is from the *First Vrbnik Breviary* (beginning of the 14th century) and the second from the *Second Ljubljana Breviary* (15th century). As can be seen from the parallel texts, this difficulty is not characteristic only for Church Slavonic, but for Latin and English as well.

b) Unlike English *and*, *i* can also introduce sentence constituents of all syntactic categories:[17]

(14) a. idêže e(stь) s'kroviĉe t'voe tu e(stь) **i** s'rce t'voe
where is repository your here is and heart your
'For where your treasury is, there will your heart be also' (L 12,34)

b. b(lagoslo)vi **i** mene o(t)če moi
bless and me father my
'Bless me, even me also, o my father.' (Gen 27,34)

c. stvori **i** sьdê v' otč'stvê tvoem'
do and here in fatherland your
'do also here in thy country' (L 4,23)

d. iže bo aĉe bez' zakona sьgrêšiše bez'
who however if without law sinned without

[17] The same also holds for *ni*.

zakona **i** pogibnut'
law and perish
'For as many as have sinned without law shall also perish without law'

Hence the categorial status of such expressions is not due to *i*, but to the phrase following *i*, which is confirmed by the fact that omission of *i* changes neither the grammatical status of the expression nor its truth-value.

c) Finally, the particle *i* sometimes has affective or interjectional flavour, usually when occurring together with pronominal interjections *se*, *to* 'there!, look!' or with adverbial *nine* 'now!', rarely alone:

(15) a. **i** vstani g(ospod)i b(ož)e moi
and arise Lord God my
'Arise, o Lord (my God)' (Ps 7,7)

b. **i** n(i)ne c(êsa)ri razumeite
and now kings understand
'O ye kings, be instructed' (Ps 2,10)

c. **i** se glasъ uslišanъ bistъ s nebese
and there voice heard was from heaven
'And there came a voice from heaven'

The first approach must treat the coordinator *i* and the particle *i* as two independent lexemes. There are two possibilities in this approach. The first is that both *i*'s are heads without categorial features; the coordinator gets the feature(s) from its specifier, as the particle does from its complement. The second possibility is that the first *i* is a head without categorial features and the second an adjunct (adverb) which has a categorial feature, but, since it is adjoined to the other category, it does not project its features to the whole expression. However, both possibilities fail to capture the fact that there is a strong functional and historical connection between the two *i*'s. With the assumption of two independent lexemes all similarities between them must be the result of pure coincidence. In addition to the fact that they have identical phonetic form and identical etymology, the fact that both of them can introduce expressions of all categories is also accidental, as are their similarities in meaning. Namely, both of them have additive meaning, and add one

thing to another.[18] In examples (14) and (15) the other (first) conjunct is usually understood (presupposed), but not lexicalized. In (12) it is often even phonetically realized. However it is not a sentence or its constituent, but a structure larger than the sentence.

It is also evident from the texts that scribes did not treat them as two different *i*'s. Moreover, the particle *i*, just like the coordinator *i*, cannot be displaced from the phrase it introduces (i.e. from the second conjunct), which is, according to Hendricks (2004) and Johannessen (2005), not characteristic for particles and correlative adverbs, but only for conjunctions. Further, if the coordinator and the particle *i* are two independent words, we could expect the group *i i* to mean 'and also'. This group is ungrammatical in modern Croatian, as well as in a number of other Slavic languages. We can't prove it ungrammatical in CCS, since the language has no native speakers, but the fact that there is no such example in the corpus[19] strongly suggests that the situation in CCS was the same. The meaning 'and also' is usually expressed by combining *i* with the particles *oče* or *takožde*, i.e. by the groups *oče i / i oče* and *takožde i*. This fact makes the assumption that the conjunction and the particle *i* are not two independent words more plausible.[20] The fact that, with the first approach, all words mentioned in the *Introduction*, and not only *i*, have to be divided into (at least) two lexemes shows that such a solution is also not economical. The problem becomes more serious for the first approach, given that CCS is not the only language in which conjunctions double as particles. We know that the situation is the same in some other Slavic languages, as well as in some from other families (for example Latin, Greek, etc.).

I think that the lexical status of the CCS word *i* is less problematic in the adjunction approach. This approach lets us treat the conjunction and the particle as instances of the same lexeme. The category of the *i*-phrase, which consists here only of the coordinator/particle *i* and the

[18] About the similarities of meaning between the conjunction and particle *i* in Russian see Uryson (2000, 2005). Malchukov (2004) connects the concepts of additivity and conjunction in a semantic map in order to explain the fact that both concepts are expressed by the same lexeme, while Zeevat and Jasinskaja (2007) went one step further and concluded the identity of the two concepts.

[19] The same also holds for the group *ni ni*.

[20] I thank an anonymous reader for suggesting this to me as an argument.

"second conjunct", is always due to the constituent following *i*, regardless of whether we consider *i* to be the head or the adjunct. Since an *i*-phrase can be adjoined to any category, it is normal that, when we have two or more conjuncts, the first one is c-selected and, therefore, determines the categorial make-up of the whole complex. When there is only one constituent introduced by *i*, this constituent determines the categorical status of the *i*-phrase. Therefore, I conclude that the adjunction approach is more appropriate for analysis of coordination in CCS than the first approach. At the moment I have no empirical argument as regards whether *i* should be treated as a head or as an adjunct (adverb), as suggested by Moltmann (1992). The second solution has one theoretical advantage, since in that case we don't need categories without category features.

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Phrasal and Clausal Comparatives: Evidence from Balkan Slavic*

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1 Introduction

It has long been known that comparatives in Balkan languages contain an overt *wh* operator (underlined in (1)),[1] corresponding to the abstract *wh* proposed by Bresnan (1973) for English, as in (2).

(1) Bulgarian
Bill e po-bogat **otkolkoto** e Susan.
Bill is more-rich than.how.much is Susan
'Bill is richer than Susan is.'

(2) Bill is richer than [$_{QP}$ *how much*] Susan is.

When I first discussed this *wh* element (Rudin 1984a,b,c), Bresnan's analysis was fairly new, still quite audacious, and entirely theoretical, so the surface appearance of an overt *wh* word in Bulgarian was an exciting

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[1] Throughout the paper comparative-introducing words are boldfaced; comparative *wh* words/morphemes and complementizers are in addition underlined.

finding. In the last few decades some other languages have also been shown to have overt *wh* quantifiers in comparatives (for instance, some Romance languages; see e.g. Matos & Brito 2008). The concept of a universal comparative operator is now widely accepted, and the simple existence of a *wh* element in (2) is no longer very noteworthy. However, the behavior of such *wh* elements is still well worth investigating. Closer examination of operators like *kolkoto* can elucidate differences among various types of comparatives, and among the various languages with overt comparative operators.

In this paper, I investigate what Bulgarian and Macedonian (and to some extent other Balkan and South Slavic languages with overt comparative *wh*) can tell us about the syntax[2] of comparative constructions. In particular, I examine comparatives which do and do not have an overt *wh* operator in Balkan Slavic (in Section 3), and ones which do and do not have an overt complementizer (in Section 4), with a view to elucidating some still-unsolved issues in the analysis of phrasal as opposed to clausal comparatives. Section 2 provides some background preliminaries, both on the Balkan data and on different types of comparatives cross linguistically, and Section 5 is the conclusion.

2 Preliminaries

2.1 Some Basic Balkan Data

Examples of comparatives with an overt *wh* operator in Bulgarian and Macedonian as well as several other Balkan and South Slavic languages are given in (3a-8a). In all of the Balkan languages (Bulgarian, Macedonian, Romanian, Albanian, and Greek) the *wh* element is a quantifier 'how much'; in the neighboring BCS (as in some other non-Balkan Slavic languages (Pancheva 2006)) the *wh* element is a non-quantificational *wh* word meaning 'what'. All of these languages also have comparatives with no overt *wh* element, but only a preposition, as seen in (3b-8b). In most cases, though not all, the preposition in the (b) version for each language is the same as what precedes the *wh* element in the (a) version. Macedonian *od* and *ot* are allomorphs determined by the voicing of the following segment. Albanian and BCS have more than one

[2] A rich literature exists on the semantics of comparatives, which I ignore here for lack of space.

choice of preposition; I return to a discussion of BCS *od* vs. *nego* in Section 4.2.

(3) Bulgarian
a. Te sa po-umni **otkolkoto** sme nie.
they are smarter than.how.much are we
'They are smarter than we are.'
b. Te sa po-umni **ot** nas.
they are smarter than us
'They are smarter than us.'

(4) Macedonian
a. Poveḱe sakam da rabotam **otkolku** da sedam.
more like$_{1SG}$ to work$_{1SG}$ than.how.much to sit$_{1SG}$
'I prefer to work than to sit.'
b. Ti si povisok **od** mene.
you are taller than me
'You are taller than me.'

(5) Romanian
a. Am mai mulţi bani **decît** ai tu.
have$_{1SG}$ more much money than.how.much have$_{2SG}$ you
'I have more money than you have.'
b. Am mai mulţi bani **ca** tine.
have$_{1SG}$ more much money than you
'I have more money than you.'

(6) Albanian
a. S'ka gjë më të bukur **sesa** të shohësh
neg thing more of beautiful than.how.much to see$_{2SG}$
Pogradecin.
Pogradec.the
'There is nothing more beautiful than seeing Pogradec.'
b. Dashke të dalësh më e zgjuar **nga** unë.
will to come.out$_{2SG}$ more and smart than me
'So you want to be smarter than me.'
c. Kënga qenka më e fortë **se** njeriu.
song too more and strong than man.the
'The song is really mightier than man.'

(7) Greek
a. Ehis perisotera vivlia **apo** **osa** eho.
have$_{2SG}$ more books than wh have$_{1SG}$
'You have more books than I have.'
b. Ise psiloteros **apo** emena.
are taller than me
'You are taller than me.'

(8) BCS
a. Toma ima lepšu sobu **nego** **što** je ova.
Toma has nicer room than what is this.one
'Toma has a nicer room than this one is.'
b. Toma ima lepšu sobu **od** vas.
Toma has nicer room than you$_{GEN}$
'Toma has a nicer room than you.'
c. Toma ima lepšu sobu **nego** vi.
Toma has nicer room than you$_{NOM}$
'Toma has a nicer room than you (do).'

At first glance these two types of comparatives seem to correspond to the classical distinction between "clausal" and "phrasal" comparatives, which I introduce in the next subsection: those with the overt *wh* operator look clausal, while those without it look phrasal. This correlation turns out to hold to some extent but not entirely, leading us to a more fine-grained analysis especially of the phrasal type.

2.2 Clausal and Phrasal Comparatives: Theoretical Background

In nearly all studies of comparative constructions, a distinction is made between a clausal type (roughly meaning that what follows *than* includes a verb or other evidence of clausal structure, as in (9)) and a phrasal type (in which what follows *than* is a single constituent, usually a nominal, as in (10)):

(9) "Clausal"
a. Bill has more shoes than **he needs**/than **Sue does**/than **Sue has**/than **Sue has skirts**/ than **Sue skirts**.
b. Bill is taller than **the door is high**.

(10) "Phrasal"
a. Bill has more shoes than **Sue**/than **boots**.
b. Bill is taller than **6 feet**.

A distinction along these lines is made for instance by Stassen (2006), Pancheva (2006), Merchant (2009), Bhatt & Takahashi (2011), among many others. Some authors use the terminology differently. Bacskai-Atkari (2014), for instance, reserves the term "phrasal" for comparatives expressed by an inherently Case-marked DP; she thus classifies some Russian and Hungarian comparatives as phrasal but all English ones as clausal.[3] But most often the terms are used in a surfacey way: if it looks like a single DP, it is phrasal.

In any case the "clausal" and "phrasal" labels are pre-theoretical and may or may not correlate with actual syntactic analysis. Considerable ink has been spilled over how the superficial form of comparatives relates to more abstract structure, especially for the phrasal type.

Although Bresnan's proposal was controversial decades ago, the clausal type is now almost universally acknowledged to have a structure something like (11). For the sake of concreteness I show the clause here as TP with a QP operator moved to SpecCP, and *than* as head of PP, but details can differ. What matters is simply that the comparative (the part following *than*) is a full normal clause containing a *wh* operator. Parts may of course be elided under identity to parts of the higher clause, (11b) is an example with nothing missing:

(11) a. -er $[_{PP}$ than $[_{CP}$ QP/op$_i$ $[_{TP}$ ... $\_\__i$ ...]]]
b. taller $[_{PP}$ than $[_{CP}$ QP/op$_i$ $[_{TP}$ the door is $\_\__i$ high]]]

The phrasal type is far less agreed-upon. Superficially in a phrasal comparative the portion following the initial preposition is just a DP, or more rarely some other constituent such as an adverb, typically with the case appropriate for the object of a preposition in the given language.

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[3] Bacskai-Atkari appears to use "clausal" to mean "underlyingly clausal"; i.e. she fully buys into the reduced clause analysis in (12) below, writing that "since the clause can be recovered, comparatives formed with *than* are invariably clausal" (3). Correspondingly she considers *than* to be a complementizer in all comparatives.

However, phrasal comparatives are often claimed to have more to them than meets the eye. Several proposed structure types are roughly sketched in (12), again assuming that *than* heads a PP and ignoring other details.[4]

(12) a. **Reduced clause analysis**
[$_{PP}$ than [$_{CP}$ op [DP ~~VP~~]]]

b. **"Direct" PP analysis**
[$_{PP}$ than [DP]]

c. **Small Clause analysis**
[$_{PP}$ than [$_{SC}$ DP Δ]

The reduced clause type of analysis (Bresnan 1973, McCawley 1988, Pinkham 1985, Bierwisch 1989, among others) posits deletion of all but one constituent of an underlying full clause, in this case a single DP. In other words, this analysis claims that phrasal comparatives have the same underlying structure as clausal ones, but with ellipsis, formalized in the earlier literature as comparative deletion, subdeletion, or stripping and more recently treated under various theories of ellipsis. The "Direct" analysis (e.g. McConnell-Ginet 1973; Brame 1983; Napoli 1983; Hoeksema 1983, 1984) asserts that a phrasal comparative is simply a PP, with a plain NP or DP object, at underlying as well as surface levels of structure.

These two types of analysis have been debated since the 1970s. Each has advantages and drawbacks. The Reduced Clause analysis accounts for the meaning of the construction, specifically for the intuition that parts of the construction are "understood" or recoverable, suggesting deletion or silent elements. *Bill is taller than Sue* clearly means *Bill is taller than the degree to which Sue is tall*, an intuition easily captured by a formulation like (13).

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[4] The category of *than* and similar comparative-introducing words is actually an important question. I assume here and will provide some evidence later that it is P, heading PP, but this is by no means a foregone conclusion. Lechner (2001) argues that the comparative construction headed by *than* is a type of coordinated clause, while many have assumed *than* is a complementizer (for instance, Bacskai-Atkari 2014).

(13) Bill is taller than [~~x-degree~~ Sue ~~is tall~~]

The Direct (PP) analysis deals more easily with the facts of case marking. *Bill is taller than her* cannot derive directly from the ungrammatical (14); at some level *her* needs to be in a position to receive case from the preposition *than* rather than the normal case for the subject of a clause.

(14) *Bill is taller than [~~x-degree~~ her ~~is tall~~]

The debate between Reduced Clause and Direct types of analyses stalled for a while after the 1980s, as research on comparatives turned almost entirely into semantic channels. In 2006 Pancheva proposed a new idea, the Small Clause analysis (12c), under which a phrasal comparative consists of a DP with an empty predicate which is filled in by copying the matrix predicate. Pancheva (2006, 2010) suggests the Small Clause analysis combines the advantages of both the other analyses, allowing case assignment from outside while still having clausal syntactic characteristics such as a predicate and clausal semantics. It is not entirely clear how small a clause Pancheva has in mind, but it would presumably at least lack the CP layer, making it transparent to case assignment.

It is possible, of course, that more than one of the proposed analyses could be correct in different cases and that not all phrasal comparatives have the same structure. This is what I will conclude, in fact; in what follows I demonstrate that there are both reduced clausal and PP (or small clause) comparatives in Bulgarian and Macedonian, with visibly different morphosyntax.

3 Comparatives With and Without Overt *wh*

3.1 Overt wh in Balkan Slavic Clausal Comparatives

With this background, we now return to Balkan Slavic. In Bulgarian and Macedonian, as noted earlier, the clausal/phrasal distinction corresponds partially to the presence or absence of the overt *wh* operator, but not completely.

In Bulgarian, *otkolkoto* (preposition *ot* + *wh* element *kolkoto*) appears in all clausal comparatives; *ot* alone is ungrammatical whenever

the comparative is a clause containing a verb, as shown in the (b) versions of (15-18).[5]

(15) a. Gradinata e po-goljama, **otkolkoto** ni trjabva.
garden.the is more-big than.how.much us$_{DAT}$ needs
'The garden is bigger than we need.'
b. * ...**ot** ni trjabva

(16) a. Bebetata sa mnogo po-umni, **otkolkoto** se
babies.the are much more-smart than.how.much refl
smjataše dosega.
considered till.now
'Babies are a lot smarter than has been thought till now.'
b. *... **ot** se smjataše dosega

(17) a. Da započneš e mnogo po-važno, **otkolkoto** da
to begin$_{2SG}$ is much more-important than.how.much to
uspeeš.
succeed$_{2SG}$
'Beginning is much more important than succeeding.'
b. *... **ot** da uspeeš

(18) a. Evropejskijat sâjuz se nuždae ot Turcija poveče,
European.the union refl needs of Turkey more
otkolkoto Ankara ima nužda ot nego.
than.how.much Ankara has need of it
'The EU needs Turkey more than Ankara needs it.'
b. *... **ot** Ankara ima nužda ot nego

The same is true in Macedonian: the *wh* element *kolku* is obligatory with clausal comparatives and the preposition *od* alone is ungrammatical:

(19) a. Podobro da umreš na noze **otkolku** da živeeš
better to die$_{2SG}$ on feet than.how.much to live$_{2SG}$

[5] These and most of the other examples in the paper were found online via Google search, and verified by native speakers.

na kolena.
on knees
'Better to die standing than to live on your knees.'

b. * ... **od** da živeeš na kolena

(20) a. Poveḱe sakam da bidam sama **otkolku** so nego
more $like_{1SG}$ to be_{1SG} alone than.how.much with him
da živeam.
to $live_{1SG}$
'I'd rather be alone than live with him.'

b. * ... **od** so nego da živeam

(21) a. Ovoj poraz boli poveḱe **otkolku** da
this defeat hurts more than.how.much to
zagubevme so 20 poeni razlika.
$lost_{1PL}$ with 20 points difference
'This defeat hurts more than if we had lost by 20 points.'

b. * ...**od** da zagubevme ...

So far, it looks like the wh operator *kolkoto/kolku* could be a marker of clausal comparatives.

3.2 Overt wh in Balkan Slavic Phrasal Comparatives

However, it is not the case that all phrasal comparatives have just the preposition *ot/od*, like those we saw earlier (in (3-8)). In fact, the *wh* element *kolkoto/kolku* does occur in phrasal comparatives. I present the facts of Bulgarian first, in 3.2.1, followed by Macedonian in 3.2.2.

3.2.1 Bulgarian. In Bulgarian, the *wh* operator *kolkoto* is found with several types of phrasal comparatives. It can be followed by a DP (as in (22)) and can also occur with certain other single constituents; namely an Adverb (23) or a PP (24).

(22) **otkolkoto** [DP]

a. Ženite se nuždajat ot poveče sân, **ot(kolkoto)**
women.the refl $need_{3PL}$ of more sleep than-how.much
mâžete.
men.the
'Women need more sleep than men.'

b. Visokijat xolesterol ubiva poveče **ot(kolkoto)** rakât.
high.the cholesterol kills more than-how.much cancer.the
'High cholesterol kills more than cancer.'
c. Zašto njakoi firmi sa po-bârzi, **ot(kolkoto)** drugi?
why some firms are more-fast than-how.much others
'Why are some companies faster than others?
d. Prodade poveče vurstove **otkolkoto** avtomobili.
sells more wursts than.how.much automobiles
'It [Volkswagen] sells more sausages than cars.'

(23) **otkolkoto** [Adv]
a. Po-dobre kâsno, **ot(kolkoto)** nikoga.
more-good late than-how.much never
'Better late than never.'
b. Edno i sâšto nešto struva po-skâpo tam,
one and same thing costs more-expensive there
ot(kolkoto) tuk.
than-how.much here
'The very same thing costs more there than here.'

(24) **otkolkoto** [PP]
a. Xorata imat po-goljamo doverie na robotite,
people.the have more-big trust in robots.the
otkolkoto na samite sebe si.
than.how.much in only.the self refl
'People have more trust in robots than in themselves.'
b. William Shakespeare e po-popularen v čužbina,
William Shakespeare is more-popular in foreign
otkolkoto v rodinata si.
than.how.much in homeland.the poss
'William Shakespeare is more popular abroad than in his homeland.'
c. ... na po-niski ceni, **otkolkoto** po vremeto na
at more-low prices than.how.much at time.the of
bivšija kmet ...
former.the mayor
'...at lower prices than at the time of the former mayor...'

In most of these cases, *otkolkoto* can be replaced with just the preposition *ot*, unlike what we saw with clausal comparatives. The parentheses in the DP and Adv examples show *kolkoto* is optional. In general, *ot* can replace *otkolkoto* before DP or Adv but not PP.[6]

3.2.2 Macedonian. The facts of Macedonian are parallel to those of Bulgarian (though it does bring one additional factor into play; see Section 2.3.) The overt comparative operator *kolku* 'how much' occurs in all types of phrasal comparatives, just like its Bulgarian cognate *kolkoto*. As shown in (25-27), it occurs with nominal, adverbial, and PP phrasal comparatives. And just like in Bulgarian, the *wh* element is optional with DP and Adverb, though not PP. Comparatives with just the preposition *od* and no *wh* operator are found with DP and adverb, as in Bulgarian. In this set the optionality is shown by *otkolku/od* instead of parentheses, because the preposition has a different allomorph before *kolku*, but the facts are exactly the same of those of Bulgarian.

(25) **odkolku** [DP]

a. Našata kuḱa može da primi poveḱe gosti **otkolku**
our.the house can to hold more guests than.how.much
/od vašata.
/than yours.the
'Our house can hold more guests than yours.'

b. Podobro e da imaš ludo dete, **otkolku/od**
better is to have crazy child than.how.much/than
lud starec.
crazy old.man
'It's better to have a crazy child than a crazy old man.'

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[6] It is necessary to qualify this statement with "in general" because of an irrelevant quirk seen in (22d), where ?****ot*** *avtomobili* would be odd at best; *kolkoto* is obligatory with plural indefinite DPs like "cars" where numbers rather than amounts or degrees are being compared; see Rudin (1984b).

c. signal trieset pati posilen **otkolku/od**
signal thirty times stronger than.how.much/than
vselenskiot šum
universe.the noise
'a signal 30 times stronger than the background space noise'

(26) **odkolku** [Adv]

a. Nikogaš ne se čuvstvuvav podobro **otkolku/od**
never neg refl $felt_{1SG}$ better than.how.much/than
sega.
now
'I have never felt better than now.'

b. Polesno e da započnete utre **otkolku/od** denes
easier is to $begin_{2PL}$ tomorrow than.how.much today
'It's easier to start tomorrow than today.'

c. Mnogu podobro mi e ovde **otkolku/od** tamo.
much better me is here than.how.much/than there
'I'm much better off here than there.'

(27) **odkolku** [PP]

a. Ovaa zagatka e mnogu polesno za decata
that puzzle is much easier for children.the
otkolku za vozrasnite.
than.how.much for adults.the
'That puzzle is much easier for children than for adults.'

b. Podobro e da si vo zatvor **otkolku** na rabota.
better is to be_{2SG} in jail than.how.much at work
'It's better to be in jail than at work.'

c. Imaš poveḱe sliki od avtomobilot **otkolku**
$have_{2SG}$ more pictures of car.the than.how.much
od tvojata devojka.
of your.the girl
'You have more pictures of the car than of your girl.'

3.2.3 Brief Excursus on Adverbs. It might seem surprising that adverbs can occur in phrasal comparatives where they appear to be the object of a preposition; however, it is actually quite expected. After all, certain types of adverbs do occur in nounlike usage in many languages, for instance as

undoubted objects of prepositions in constructions other than comparatives. In the following Bulgarian examples, the preposition *ot* 'from,' is presumably the same as *ot* glossed as 'than' in the comparative examples in this paper. It is followed by a DP ('America') or an Adverb ('here'). Notice the English glosses also have a preposition with either a nominal or adverbial object:

(28) a. Ot [Amerika] li si?
from America Q are$_{2SG}$
'Are you from [America]?
b. Ot [**tuk**] li si?
from here Q are$_{2SG}$
'Are you from [here]?

Adverbs can also function as subjects of sentences, in both Bulgarian and English:

(29) Točno **tuk** e ljubimoto mi mjasto.
exactly here is favorite.the my place
'Right here is my favorite place'

Babby (1974) points out that Russian adverbs not only can occur in comparatives but also take case forms, strongly suggesting they are nominal(ized):[7]

(30) bol'še obyčnogo
more usually$_{GEN}$
'more than usually'

In fact, *ot/od* in comparatives behaves like any normal preposition, being followed only by a DP or nominalized item including certain types of adverbs. *Kolkoto* is optional exactly where what follows it is something that can normally follow a preposition, giving some support to the idea that ot/od (and perhaps other comparative-introducing words cross-linguistically, including *than*) are prepositions.

[7] Thanks to Steven Franks for bringing Babby's work to my attention.

3.2.4 Case in Phrasal Comparatives. When DP in a phrasal comparative with *otkolkoto/odkolku* is a pronoun (the only situation where Case is visible in Bulgarian and Macedonian, which have lost most of the ancestral Slavic case system), it can be either nominative or objective case. (31) shows this in Bulgarian; Macedonian facts are identical.

(31) **otkolkoto** nie/nas
than.how.much we/us
'than we/us (NOM/ACC)' Bulgarian

The case of the pronoun depends on its role: in (32a) *nie* matches the nominative case of the corresponding subject *te* in the main clause, while in (32b) *nas* has the same accusative case and the same role in its clause as the matrix object *vas.*

(32) a. Te poveče se bojat sega, **otkolkoto** nie.
they more refl $fear_{3PL}$ now than.how.much we
'They are more afraid now than we (are).'
b. Tova vâlnuva poveče vas, **otkolkoto** nas.
this excites more you than.how.much us
'This is more exciting to you than (it is to) us.'

On the other hand with *ot* alone the pronoun is always objective, case being assigned by the preposition.

(33) **ot** nas 'than us (ACC)'
* **ot** nie 'than we (*NOM)'

This suggests that phrasal comparatives with *otkolkoto* are reduced clauses, with the verb and other material elided, while those with *ot* are not, an idea I formalize in the next subsection.

3.3 Two Types of Phrasal Comparatives
Based on the case facts just discussed, as well as the need for a syntactic position for the *wh* operator, I posit that phrasal comparatives in Balkan Slavic come in two types: CP and non-CP. That is, both the "Reduced Clause" analysis (12a) and one of the other proposed analyses (Direct PP

or Small Clause) are instantiated in Bulgarian and Macedonian. This claim is summarized in (34).

(34) Phrasal comparatives with *wh* are Reduced Clause (CP)
Phrasal comparatives without *wh* are PP (or SC).

The *wh* element (*kolkoto/kolku*) always indicates an underlying clause (CP); that is, comparatives with the *wh* operator all have full clausal structure, whether their surface form is that of a clausal comparative or a phrasal one in traditional terms. Thus the "clausal" (35a) has the same structure as the "phrasal" (35b/c). The first line in each example is Bulgarian; the second line is the corresponding Macedonian.

(35) a. **otkolkoto** sme nie [PP ot [CP *wh* [TP sme nie]]]
otkolku sme nie
than.how.much are we
'than we are'

b. **otkolkoto** nie [PP ot [CP *wh* [TP ~~X~~ nie ~~X~~]]]
otkolku nie
than.how.much we
'than we'

c. **otkolkoto** nas [PP ot [CP *wh* [TP ~~X~~ nas ~~X~~]]]
otkolku nas
than.how.much us
'than us'

Conversely, comparatives without the *wh* word are not CPs; instead, their structure is that of a simple PP with a DP, or possibly small clause, object. Pancheva's (2006) arguments for the small clause analysis are mostly semantic and would take us too far afield. In (36) I simply leave open the option that comparatives without *kolkoto/kolku* could be Pancheva-style small clauses instead of simple PPs; in this case the lack of a CP layer would allow accusative case assignment by the preposition.

(36) **ot** nas [PP ot/od [DP nas]]
od nas or: [PP ot/od [SC nas Δ]]
than us
'than us'

In other words, presence of a *wh* operator indicates either a full or reduced CP, while lack of *wh* indicates lack of CP structure. A CP projection is necessary for *wh* movement of the operator, so all *otkolkoto/odkolku* comparatives are CPs, even those which are superficially phrasal. Furthermore, *kolkoto* is obligatory in comparatives which are CPs. The apparent optionality of *kolkoto* before DP and Adv is due to the fact that the DP or Adv can either be a clausal remnant or object of a preposition. The CP projection blocks case assignment by the preposition, so the single DP in a reduced clausal comparative like (35b/c) carries the appropriate case for its role/position within the clause.

4 Comparatives with and without overt complementizer

4.1 Macedonian što

Up to this point, Macedonian and Bulgarian behave exactly alike; however, the two languages are not identical in all details. Macedonian adds an additional piece to the comparative puzzle in that it sometimes also allows an overt complementizer to occur, and like the occurrence or lack of the *wh* word *kolkoto/kolku*, this complementizer is diagnostic of a particular type of comparative construction. Bulgarian never has an overt complementizer in comparatives, but some other languages do, including BCS and Greek; I return to these in the following subsections.

In Macedonian, the complementizer *što* 'that' often occurs alongside the operator *kolku*:

(37) a. Poveḱe umraat **otkolku** **što** se raǵaat.
more die$_{3PL}$ than.how.much that refl be.born$_{3PL}$
'More are dying than are being born.'

b. Deteto e popametno **otkolku** **što** mislat.
child.the is smarter than.how.much that think$_{3PL}$
'The child is smarter than they think.'

c. Počesto čita knigi **otkolku** **što** izleguva so drugarite.
more.often reads books than.how.much that goes.out with friends.the
'He reads books more often than he goes out with his friends.

d. Stareete pobrzo **otkolku** **što** bi trebalo.
age$_{2PL}$ faster than.how.much that cond should
'You are getting old faster than you should.'

Comparatives with *(otkolku) što* are always full finite clauses. Phrasal comparatives never contain *što*. Furthermore, it seems to make a difference what kind of clause is involved: comparatives consisting of the modal, infinitive-like *da* clause construction, like (19), (20), or (21) never allow *što*, although they do include a finite verb.[8] Gapped or otherwise reduced clauses do not take the complementizer. A nice example comes from an article about the Chinese military. The headline, (38a), is gapped and has just *otkolku*; but the corresponding sentence in the body of the article, (38b), is a full clause, with *otkolku što*.

(38) a. Tie imaat poveḱe vojnici **otkolku** Makedonija
they have more soldiers than.how.much Macedonia
žiteli.
inhabitants
'They have more soldiers than Macedonia (has) inhabitants.'

b. Tie imaat poveḱe od 3 milioni vojnici, što e
they have more than 3 million soldiers that is
rečisi milion poveḱe **otkolku** **što** Makedonija
said million more than.how.much that Macedonia
ima žiteli.
has inhabitants
'They have more than 3 million soldiers, which is to say a million more than Macedonia has inhabitants.'

Some Macedonian grammarians claim a semantic distinction between *otkolku* and *otkolku što*; for instance, the web site "Digitalen Rečnik na Makedonski Jazik" suggests that *otkolku* denotes a preferred choice, while *otkolku što* indicates a comparison. But this clearly does not hold in (38) or numerous other examples. Instead, the distinction is syntactic:

[8] Thanks to Elena Petroska for confirming this judgment. The structure of *da* clauses is a complex issue, which I will not attempt to address here except to note that the **otkolku što ... da* facts appear to favor approaches under which *da* clauses are less than fully finite, e.g. lack a true tense projection.

što indicates a full finite clause as opposed to any type of phrasal comparative, including reduced clausal ones. *Što* is not obligatory in full clausal comparatives, but is overwhelmingly common and apparently preferred, at least by some speakers.

4.2 Wh and Complementizer in BCS Comparatives

Macedonian is not alone in allowing a complementizer to appear in some comparative constructions. BCS also admits a complementizer, under conditions intriguingly slightly off kilter from those of Macedonian.[9]

A range of possibilities for forming a comparative in BCS is given in (39-40).

(39) Clausal

a. Marijina soba je bolja **nego** **što** je Ivanova (soba).
Mary's room is better than what is Ivan's room

b. Marijina soba je bolja **nego** **što** **li** je Ivanova (soba).

c. Marijina soba je bolja **nego** **li** je Ivanova (soba).

d. ?? ... **nego** je Ivanova soba
'Mary's room is better than Ivan's (room) is.'

(40) Phrasal

a. Marijina soba je bolja **nego** Ivanova (soba).

b. Marijina soba je bolja **nego** **li** Ivanova (soba).

c. * ... **nego** **što** Ivanova (soba)

d. * ... **nego** **što** **li** Ivanova (soba)
'Mary's room is better than Ivan's (room) is.'

Example (39a) is the typical Balkan pattern for clausal comparatives, with a probably-prepositional introducing word *nego* and *wh* word *što* (by the way, not to be confused with the homophonous Macedonian complementizer *što*). Sentence (39b) shows it is also possible to have the complementizer *li* accompanying the *wh* element, much like the combination of *wh*+complementizer in Macedonian. But unlike in

[9] I am grateful to Bojan Belić for pointing this out and providing the data in (39-40). There appears to be some dialectal or ideolectal variation in judgments; some speakers find the examples with *li* (39b,c) and (40b) to be questionable or awkward.

Macedonian,[10] it is also possible for *li* to occur on its own (39c), without the *wh* word. Although clausal comparatives in BCS do not always contain the *wh* element, it seems they need to have either *wh* or complementizer (either *što* or *li* or both); a clausal comparative with just *nego* is marginal (39d).

Conversely, *nego* alone is the norm for phrasal comparatives, which cannot contain *što* (as shown by the starred (40c,d)). However, somewhat unexpectedly *li* can occur (40b). If *li* here is a complementizer, as it undoubtedly is elsewhere in BCS, it suggests that (40b) has a CP structure; that is, it is the reduced clausal type of phrasal comparative.

A further complication is that, in addition to the comparative-introducing word *nego*, BCS comparatives can also be formed with another preposition, *od* (see also (8) above), which does not co-occur with either *što* or *li*, suggesting that comparatives with *od* have no clausal structure but are simply PP. Interestingly, *nego* and *od* comparatives also differ in possible interpretations as well as in the case of their complement:[11]

(41) a. Ženama san treba više **od** muškaraca.
women$_{DAT.PL}$ sleep need more than men$_{GEN.PL}$
'Women need sleep more than men (do).'
or 'Women need sleep more than (they need) men.'

b. Ženama san treba više **nego** muškarcima.
women$_{DAT.PL}$ sleep need more than men$_{DAT.PL}$
'Women need sleep more than men (do).'

---

[10] The string *od što* does occur in Macedonian comparatives, as in (i)

(i) ǩe mu donese poveǩe od što ǩe dade.
will him bring more than what will give
'It will bring him more than he gives.'

However, *što* here is the homophonous *wh* word (than [*what* he gives]); this is actually an example of *od*+phrasal comparative. Compare a simple PP example:

(ii) Od što se plašite? 'What are you complaining about?

[11] Thanks to Dunya Veselinović for these examples. Compare also (8b/c) which differ in the case of the pronoun *vas* vs. *vi*.

The complement of *od* is always Genitive case and the resulting phrasal comparative, *od muškaraca* in (41a), has the familiar ambiguity of phrasal comparatives in many languages, including English: the men here can be interpreted as either subject or object of 'need'. On the other hand, the complement of *nego* takes a case appropriate to its thematic role within the clause and can only be interpreted as having that role; in (41b) it is Dative, like the corresponding nominal, *ženama*, in the main clause, while in (40) *Ivanova (soba)* is nominative. This reinforces the claim that phrasal comparatives with *od* in BCS are simple PP, while phrasal comparatives with *nego* are (or at least can be) underlyingly clausal.

One loose end is why *što* occurs only in full clausal (39) and not in reduced clausal (40) comparatives. If *li* indicates the presence of a CP projection, we might expect a *wh* operator to be able to occur in phrasal comparatives like (40c,d). Perhaps *li* is not in C in comparatives, but in a lower functional head. *Li* in South Slavic languages marks interrogation and/or focus, and is sometimes analyzed as heading a focus projection instead of CP. In this case the *nego* phrasal comparatives would still be "reduced clausal" but with a somewhat smaller clause, lacking the CP layer, and thus excluding *što*. On the other hand, we know that comparative *wh* operators (and complementizers) cross linguistically are very often silent, and conditions on when they can be overt are idiosyncratic. For the moment I assume *nego* comparatives are CP. BCS thus has the following types of comparatives:

(42) a. Full Clausal: $[_{PP}$ *nego* $[_{CP}$ (*što*) $[_{C'}$ (*li*) [DP]]]]
b. Reduced Clausal: $[_{PP}$ *nego* $[_{CP}$ Ø $[_{C'}$ (*li*) [DP]]]]
c. Direct PP: $[_{PP}$ *od* [DP]]

Although the facts are not quite the same as in Bulgarian and Macedonian, once again we find clear evidence for two types of phrasal comparatives, one which has clausal structure and one which is just PP.

4.3 Parallels in Other Languages

Without going into detail, it is worth mentioning that other languages possess similar facts to those presented for Balkan Slavic; for a fuller understanding of clausal and phrasal comparatives much more cross linguistic data should be taken into account. I briefly mention just a few

cases here. Among the Balkan languages, Greek also allows a complementizer in comparatives; similar to Macedonian and BCS, but with a twist. In Greek the complementizer always occurs on its own, without an accompanying *wh* word, and apparently occurs only in clausal comparatives, like (43b-c). (Examples from Merchant 2009:135f)

(43) a. I Maria pezi kithara kalitera **apo** ton Gianni.
the Maria plays guitar better than the Giannis
'Maria plays guitar better than Giannis.' (phrasal)

b. I Maria pezi kithara kalitera **ap'<u>oti</u>** pezi kithara o Giannis.
the Maria plays guitar better than.that plays guitar the Giannis
'Maria plays guitar better than Giannis plays guitar.' (clausal)

c. Eparhoun perisoteres evdomades se ena hrono **apo <u>oti</u>** eparhoun meres s'ena mina.
there.are more weeks in a year than that there.are weeks in.a month
'There are more weeks in a year than there are days in a month.'

Albanian, like BCS, has two different comparative prepositions with differing properties. Many Slavic languages permit overt *wh* expressions in comparatives, as pointed out by Pancheva (2006), but they differ in which *wh* words appear and under what conditions. In addition to those discussed by Pancheva, the following were mentioned by FASL audience members:[12] Croatian equal comparatives can have *koliko* 'how much' instead of the *što* seen in unequal comparatives. And Slovene uses *kod* 'how' in phrasal comparatives:

(44) Marko je veći kod Bojan.
Marko is taller how Bojan
'Marko is taller than Bojan.'

[12] Thanks to Martina Gracanin-Yuksek for the Croatian comment and Adrian Stegovec for the Slovene.

Finally, consider colloquial English, which also allows overt *wh* in some comparatives.

(45) a. She's taller than **what** I am.
b. Their science requirement is a lot less than **what** ours was when I went to college.

This use of *what* is limited to clausal comparatives, and is impossible in all phrasal ones:

(46) a. *She's taller than **what** me/I.
b. *Their science requirement is a lot less than **what** the old requirement.

This looks like BCS *što* and different from Bulgarian/Macedonian *kolkoto/kolku*, which do occur in the reduced-clause type of phrasal comparatives, as we've seen. Clearly different languages have different conditions on when a *wh* element and/or a complementizer can be overt. The reason for these differences remains opaque, but the fact is well established that comparatives, including some phrasal comparatives, can in principle have the full clausal structure including complete CP layer with *wh* landing site and complementizer head, while others do not.

5 Conclusion

The main conclusion of this paper is that phrasal comparatives are not all the same. The Balkan Slavic languages, Bulgarian and Macedonian, provide clear evidence that there are at least two distinct types of what have been traditionally called "phrasal" comparatives, one of which actually has the structure of a clause.

The presence of an overt *wh* operator, *kolkoto* or *kolku*, indicates that the comparative is a CP even if its superficial form is that of a phrasal comparative; it has clausal architecture including a left-peripheral position containing the *wh* operator. Lack of a *wh* operator characterizes comparatives which are simply PP at all levels of structure (or possibly small clause). In Macedonian, the complementizer *što* further marks full clauses as opposed to those with elided elements, including the modal *da* clauses which perhaps are less than fully clausal in some sense. Overt

morphology clearly identifies several different types of comparatives, summarized in table (47), which are less easily separated in languages outside the Balkans.

(47)

Traditional label	Type	Bulgarian	Macedonian	syntactic structure
"clausal"	full clause	otkolkoto	odkolku (što)	clause (CP)
"phrasal"	reduced clause	otkolkoto	odkolku	
	PP	ot	od	underlying PP

Along the way we have also seen some evidence that comparatives are PP, at least in Balkan Slavic, where the preposition *ot/od* takes the same kinds of objects as other prepositions: DP, (nominalized) Adverb, or (nominalized) clause. And finally we have seen that languages in and out of the Balkans have a range of situations in which overt *wh* operators and/or complementizers can appear, which provide an opportunity for much work to come.

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Focus Trigger and Sluicing in Russian Yes/No Questions: Unified Sluicing Analysis and Machine Translation Application in ABBYY Compreno*

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This article represents an analysis of both structural and distributional properties of ellipsis in Russian embedded Yes/No questions (further YNE) in order to classify it among other types of ellipsis. The goal of this paper is to compare YNE with sluicing and show that these phenomena are two kinds of the same type of ellipsis, as they display similar syntactic and semantic properties. A unified syntactic licensing condition for both types of ellipsis in embedded questions will be proposed, involving the Foc^0 as the licensing head, a position lower than the one proposed in the extensive work on sluicing, namely Merchant 2001. Also a typological prediction will be made that YNE is possible in any language with a focus-sensitive yes/no embedded question marker. This prediction is borne out in Turkish and Bulgarian.

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1 What is Sluicing?

The term **sluicing** was coined by Ross (1969) for a special type of ellipsis in embedded wh-questions illustrated in (1) for English and (2) for Russian:

(1) Jack bought something, but I don't know **what** ~~Jack bought~~.
Merchant 2001: 3

(2) Petja kupil čto-to, no ja ne znaju, **čto** ~~Petja kupil~~.
Peter bought smth but I NEG know what Peter bought
'Peter bought something, but I don't know what (he bought).'

Since then the phenomenon has been thoroughly studied, the most comprehensive study being Merchant 2001. For wh-fronting languages the licensing conditions for sluicing are as follows:

1. The presence of a null [+wh, +Q] C^0
2. The presence of a special E feature on I^0 *(the E feature roughly means "I am LF-isomorphic to a constituent in the context"* [1])

Thus, the structure may be represented as the following tree in Fig. 1:

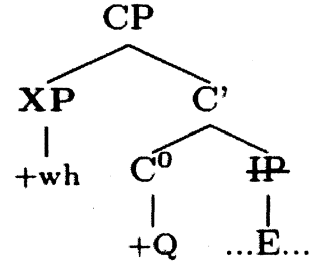

Fig. 1: Sluicing structure by Merchant (2001)

[1] The second condition and the semantics of the E-feature **will not be addressed** in this article. For a more detailed analysis please see Merchant 2001, pages 10-39.

What is left of the elided subordinate clause, namely the XP, is conventionally called a **sluice**. Any other material that may appear in COMP, such as moved auxiliaries or overt complementizers, is banned. This observation was made in Merchant 2001 and dubbed the **sluicing COMP-generalization**. It can be easily illustrated on the basis of English sluicing in matrix sentences (3):

(3) A: Max has invited someone.
B: Really? Who (*has)? Merchant 2001: 63

Further overview of sluicing in Russian and its properties will be provided in Section 3.1, parallel to YNE properties. For a more detailed account of Russian sluicing, please see Grebenyova (2006) and Grebenyova (2007).

2 What about Yes/No Questions?

In recent years, sluicing has been thoroughly studied, see a collection of articles in Merchant & Simpson 2012; however, there have been few attempts to study the availability of ellipsis in yes/no embedded questions in any language and compare its structure and behavior to sluicing, e.g. Hoyt & Teodorescu 2012 for Romanian.

Russian happens to have a construction similar to ellipsis in embedded Yes/No questions (further - YNE) illustrated in (4)[2]:

(4) Kto-to prišël, no ja ne znaju, Petja li.
smn came but I NEG know Peter LI
'Someone came, but I don't know whether it was Peter.'

To understand the underlying structure of the sentence in (4), let's take a look at the syntax and semantics of Russian yes/no questions and similar behavior exhibited by YNE and sluicing.

[2] The Russian yes/no question complementizer will be glossed as "LI" for convenience.

2.1 Complementizers

LI is the complementizer used to mark yes/no questions in Russian. Matrix yes/no questions can contain the overt LI-complementizer, but mostly the illocutionary force is expressed by intonation and word order. Embedded yes/no questions in Russian are obligatorily marked by LI:

(5) Ja ne znaju, prišël li Petja.
I NEG know came LI Peter
'I don't know, whether Peter came.'

It should be noted that LI is an enclitic, so it cannot be used in the beginning of the clause:

(6) *Ja ne znaju **li** prišël Petja.
I NEG know LI come Peter
'I don't know whether Peter came.'

2.2 Types of Yes/No Questions

Unlike in English, Russian yes/no questions can be **broad**, analogous to whether-questions (further - BYNQ), and specific, focused, or **narrow**, analogous to whether-questions with emphatic clefts (further - NYNQ). The example in (5) illustrates the BYNQ type. In this type, the LI-complementizer always attaches to the matrix verb, thus asking a question about the whole sentence.

In the NYNQ type, the LI-complementizer attaches to some other constituent, asking a question only about this constituent:

(7) Ja ne znaju, **knigu** li Petja kupil.
I NEG know book LI Peter brought
'I don't know whether it was a book that Peter brought.'

The movement of the focused constituent to the beginning of the yes/no question, whether embedded or matrix, is obligatory:

(8) *Ja ne znaju, Petja kupil **knigu** li.
I NEG know Peter brought book LI
'I don't know whether it was a book thatPeter brought.'

This paper will concentrate on the NYNQ type of yes/no questions in Russian, as they are used to derive elided structures in YNE.

3 Yes/No Questions Ellipsis

3.1 Is it really ellipsis or not?

In the rest of the article I will be looking at examples of YNE, like the one in (9). Throughout the analysis, parallel sluicing and YNE examples will be provided between slash signs as alternative continuations of the same sentences, the sluicing being marked by italics:

(9) Jemu čego-to ne xvatajet,
Him smth.GEN NEG misses
no ja ne znaju **/vnimanija** li. */čego*
but I NEG know attention.GEN LI smth.GEN
'He lacks something, but I don't know /whether it's attention */what.*'

For convenience, I will call the boldface remnant a sluice. A legitimate question arises: how do we know that we are really dealing with ellipsis in such examples? It could have been the case that the genitive on the sluice in (9) is assigned directly by the verb *znat'* "to know" under negation. However, there are tests that can help us prove the presence of an elided structure. I borrow these tests from the broad analysis of sluicing in Merchant 2001 and will mention only some of them here.

3.1.1 Case assignment. Case in other examples of YNE or sluicing show that the matrix verb cannot be the assigning head, so there should be some missing material.

(10) Vasja nedovolen kem-to. Ne znaju, **/Petej** li
Vasja dissatisfied smn.INSTR NEG know Peter.**INSTR** LI
/*Petju li. ***/kem.*** ***/*kogo.***
Peter.**ACC** li smn.INSTR smn.ACC
"Vasja is dissatisfied with someone. I don't know /whether it is with Peter./ *with whom.*"

In case of example (10), the matrix verb *znat'* "to know" under negation can assign only genitive. But using *Peter* or *who* in the accusative case is clearly ungrammatical, while the instrumental assigned by the adjective *nedovolen* "unsatisfied" fits perfectly. Only the presence of an elided predicate *nedovolen* can explain this difference in grammaticality.

3.1.2 Verb agreement. In sentences where the subject happens to be a CP, the verb shows default agreement (in Russian it is third person singular or neutral singular, depending on the tense). Remarkably enough, if a sluice is placed in the subject position of a verb, the verb appears with default agreement features and the agreement with the NP inside the sluice is blocked:

(11) Kto-to kričal./Čelovek li, */Kto*, bylo neponjatno.
Smn cried Human LI who was.**N**.3SG unclear.**N**.3SG
/*byl neponjaten.
/was.**M**.3SG unclear.**M**.3SG
'Someone was crying, but /whether it was a human */who*, was unclear.'

3.2 Types of YNE

As sluicing, YNE can also be classified according to different parameters:

3.2.1 Types of Sluices. Sluices in YNE can be both arguments or adjuncts, just like sluices in the "canonical" sluicing. All the previous examples were for argumental YNE. Below is an example of adjunctival YNE:

(12) On uexal kuda-to. Ne znaju, **domoj** li. */kuda.*
He went somewhere NEG know home LI /where
'He went away somewhere. I don't know /whether he went home */where.*'

3.2.2 Presence of Antecedent. According to Merchant, an antecedent for sluicing is an XP which occupies the **same** semantic and syntactic position in the antecedent of the elided IP as the sluice does in the elided IP. Just as for sluicing, antecedents can be present (13a) or absent (13b) in YNE:

(13) a. Present antecedent
Petja priedet **kogda-to**, no ja ne znaju, /zavtra li. */kogda.*
Peter comes some-day but I NEG know tomorrow LI when
'Peter will come some day, but I don't know /whether he will come tomorrow. */when.*'

b. Absent antecedent
Petja priedet, no ja ne znaju, /zavtra li. */kogda.*
Peter comes but I NEG know tomorrow LI when
'Peter will come, but I don't know /whether he will come tomorrow/*when.*'

3.2.3 Multiple YNE. Several works like Rudin 1985 have pointed out that it is possible to have more than one wh-sluice in sluicing. This construction is mostly available in languages allowing for multiple wh-fronting, such as Bulgarian or Russian. It should not come as a surprise that there is an analog in YNE – Multiple YNE, and also a transient, "semi-sluicing" form. I won't discuss the exact structure of such sentences here and will content myself with a mere description of the facts, leaving the matter for future investigation.

(14) On viditsja s kem-to iz druzej každyj den'. Ne znaju,
He meets with smn from friends every day. NEG know
'He meets with someone of his friends every day. I don't know…'
a. sluicing: s kem kogda.
with whom when = 'with whom when'
b. semi-sluicing: s kem segodnja.
with whom today = 'with whom today'
c. YNE: s Petej li segodnja.
with Peter LI today = 'whether he is meeting Peter today.'

3.3 YNE and Syntactic Islands
It has been observed since the discovery of sluicing by Ross (1969) that sluicing can astonishingly repair ungrammatical sentences with islands, deleting the ill-formed part of the structure. An extensive research of the interaction between islands and sluicing can be found in Merchant 2001.

For this paper, I checked 6 islands (namely, Coordinate Structure Island, Adjunct Island, Sentential Subject Island, Relative Clause Island, Subordinate Question Constraint, ECP) for all combinations of sluicing types (with or without antecedent, adjunct or argument). Interestingly, YNE has successfully repaired all the islands. Some examples are given below, with parallels in English and Russian sluicing for comparison:

Adjunct Island

(15) Kogda Maša otravilas', on rasstroilsja. Možet, on
When Masha poisoned he got.sad maybe he
gadal, ne ego li tortom.
guessed NEG his LI pie
'When Masha got poisoned with something, he got very sad. Maybe he was wondering, whether it was with his pie.'

Sentential Subject

(16) Čto on bolen, ponjatno. Neponjatno, grippom li.
That he ill clear Unclear flu LI
'That he is ill, is clear. It is not clear, whether he's got flu'

(17) Gde on, izvestno. Neizvestno, s kem.
Where he known unknown with whom
'It is known, where he is. It is unknown, with whom'.

Coordinate Structure Constraint:

(18) Ona nesla sumku i čto-to eščë. Ne znaju, gazetu li.
She brought bag and smth else NEG know paper LI
'She was holding a bag and something else. I don't know, whether it was a paper'.

(19) I saw Peter and someone else. I don't know who ~~I saw Peter and.~~

4 Unified Analysis

As there are so many syntactic parallels between the behavior of sluicing and YNE, it is very logical to suppose that they represent two types of the same kind of ellipsis. The only step to be made is to elaborate the unified licensing conditions.

However, to achieve this goal we should first determine the exact syntactic structure of the Russian yes/no questions with the LI-complementizer.

4.1 Syntax of the LI-complementizer

There is no doubt about the LI-complementizer being the head in C^0. The main two competing analyses differ in the kind of XP that this head c-celects. Rivero (1993) and King (1993), argue that LI c-celects an IP. Thus, the verb, being a head, adjoins to LI in C^0 in the BYNQ.

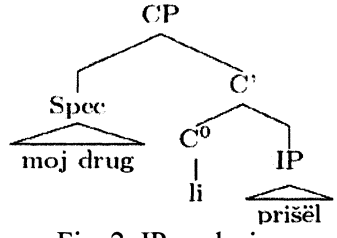

Fig. 2: IP analysis

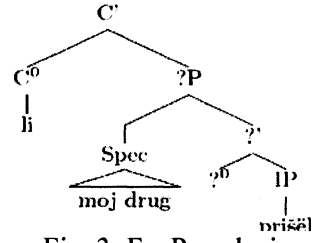

Fig. 3: FocP analysis

In the NYNQ the focused constituent moves to [Spec;CP], as in Fig. 2.

Meanwhile Franks & King (2000) proposed that the IP analysis can't efficiently explain the linear order present in the NYNQ questions:

(20) Ja ne znaju, [moj li drug prišël].
I NEG know my LI friend came
'I don't know whether it was my friend who came.'

(21) *Ja ne znaju, **moj drug li** prišël.
I NEG know my friend LI came
'I don't know whether it was my friend who came.'

According to Fig. 2 and taking into account that LI is a clitic, the expected linear order would be the order presented in example (21), which is not correct. No economy considerations would allow LI to go any further in the structure, because its need for a phonetic host is already satisfied. So why should the real linear order be that in (20)?

Franks & King (2000) propose that the Russian LI-complementizer doesn't c-select an IP but a FocP, see Fig. 3. The focused XP moves to the [Spec;FocP], a position lower than the C^0

hosting LI. Thus, LI needs to move down to satisfy its need for a host on the left. The most economic way to do this is to go as far as the end of the first phonetic word. This analysis correctly predicts that LI-complementizer is a Wackernagel clitic (that is, a clitic that appears on the second position in a clause), and I will assume that the syntactic structure for embedded yes/no questions in Russian is the one in Fig. 3.

However, there is still one more question to solve: so far I have been merely stipulating that there is a FocP in question. But how can we prove there is really Focus involved?

4.2 Tests for Focus in YNE

There are several tests that can be used to diagnose focus. I will mention only some of them to show that LI does indeed c-select for a FocP.

4.2.1 Exact Numerals. Numerals are generally interpreted as containing "at least" as part of their semantics. In Kiss 2010 it is shown that focused numerals can only mean the exact amount. This is what happens with numerals under LI, as the infelicitous continuation shows:

(22) Pjat' li knig on kupil? - #Da, daže sem'.
Five LI books he bought - Yes even seven
'Did he buy FIVE books? - *Yes, he even bought seven books'

4.2.2 Non-Specific NPs. Exhaustive focus is incompatible with non-specific NPs. In King 1993 on page 140, example (15b), the impossibility of using non-specific NPS under focus is shown with LI:

(23) *Ja ne znaju kto-nibud' li prišël.
I NEG know somebody LI came
'I don't know whether somebody came.'

However, when the non-specific NP is not in the specifier of the complementizer LI, it is not under focus anymore and the sentence becomes grammatical:

(24) Ja ne znaju prišël li kto-nibud'.
I NEG know came LI somebody.
'I don't know whether somebody came.'

4.2.3 "Kiss correction test". Some authors like Gracheva (2013) argue that LI is a contrastive focus marker using a so-called "correction test". In Kiss 1998 the test is described as answering a "loaded" yes/no question with a focused constituent or correcting a wrong statement:

(25) Did the woman eat BEANS? - No, she ate POTATOES.

Reversing (25) is saying that whenever you have a "loaded" answer, the corresponding XP in the question is focused. This is exactly the effect observed in (26), where b is an illegitimate question-pair for the c answer, while a is completely perfect:

(26) a.Kartošku li ona jela?
Potatoes LI she ate
'Was it potatoes that she was eating?'
b.#Jela li ona kartošku?
Eat LI she potatoes
'Did she eat potatoes?'
c.Net, ona jela POMIDORY.
No she ate tomatoes
'No, she was eating tomatoes.'

Thus, the structure for a Yes/No Question in Russian is as follows:

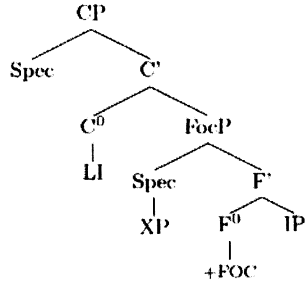

Fig. 4: Structure of a Yes/No Question in Russian

4.3 Focus and wh-words

As has been proved in the previous section, marked constituents in narrow yes/no questions occupy the [Spec;FocP]. Meanwhile, it has been claimed that the wh-words always occupy [Spec;FocP] or bear a focus-marking. Otherwise, they lose their wh-meaning, as shown in Haida 2007 for German:

(27) Wer mag $was_{unfocused}$? (German)
Who want what
'Who wants something? *Who wants what?'

4.4 Semantics of LI and wh-words

Finally, besides all the parallelism of syntactic behavior, the narrow yes/no questions, from which YNE is evidently derived, bears some interesting semantic similarities to the wh-questions. First, they both bear the same presuppositions in their semantics:

(28) Petja li prišël? -Net, Vasja. /#Nikto ne prišël
Peter LI came no Vasja Nobody NEG came
'Was it Peter who came? – No, it was Vasja. /#Nobody came'

The example (28) presupposes that there was someone coming. The same presupposition is present in wh-questions and in cleft constructions I used to translate YNE throughout this article:

(29) Cleft: It was Peter who came. → Someone came.
Wh-question: I don't know who came. → Someone came.

Second, if we adopt the Rooth (1985) alternative semantics for focus to describe NYNQ and Karttunen (1977) semantics for questions to describe wh-questions, the semantic representations of both will constitute the same sets of propositions:

(30) [Peter LI came] = alternatives = {Mary came, John came, etc.}
[who came] = possible answers = { Mary came, John came, etc }

4.5 Unified Analysis

Combining all the observations made, the following unified structure for both sluicing and YNE can be derived:

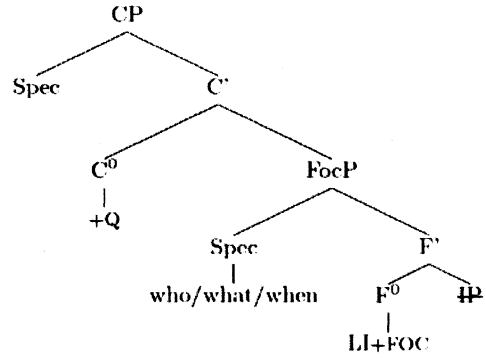

Fig. 5: Unified structure for Sluicing and YNE

Thus, the new licensing conditions for YNE and sluicing together can be formulated as follows:

1. The presence of a [+FOC] Foc[03]
2. The presence of a special E feature on I^0

This unified analysis has several advantages. First, it shows that not only wh-sluicing is possible, but also its yes/no-counterpart. Second, it reconciles the two different sluicing analysis made by Merchant (2001) and Lobeck (1995)[4]. And, finally, it bears a typological prediction over the availability of YNE in different languages.

4.6 Typological Prediction

YNE is available in any language, where the yes/no question marker is focus-sensitive. If the language lacks such a marker, YNE won't be possible.[5]

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[3] Similar proposals of *+focus* as the triggering feature can be found in van Craenenbroeck 2012, Grebenyova 2007, Erschler 2015.

[4] The +Foc feature can be considered the feature for strong agreement in Lobeck analysis.

[5] However, similar surface effects can be achieved by other means.

By now 42 languages (with and without available sluicing) have been studied, and only 3 languages have been confirmed to have sluicing without doubt: Turkish, Russian and Bulgarian. A Bulgarian example can be seen below:[6]

(31) Pešo govori za nešto s Vasko, no ne znam
Peter talks about smth to Vasja but not know
za politika li
about politics LI
'Peter is talking about something to Vasja, but I don't know whether he is talking about politics.'.

I will leave the question of why sluicing is much more frequent across languages than YNE to further research. However, this difference in frequency posits a great problem for machine translation of YNE from languages where YNE is present to those where it is absent. I will show an example of YNE description in the system Compreno that avoids the problem of asymmetry.

5 YNE Description in Compreno (ABBYY)

5.1 Compreno System

Compreno is an integral model of natural language description designed for syntactic and semantic analysis of texts and for more complicated tasks such as machine translation, fact extraction or document classification. The main goal of Compreno is not only to disambiguate and derive a syntactic representation of a text, but also to model its semantics. Thus, the system itself consists of three main modules: the semantic, the syntactic and the statistical components. I will describe its structure in a sketch-like manner. For more detailed information please see Anisimovitch et al. 2012.

The semantic component is a semantic hierarchy – a thesaurus hierarchical tree, in which non-terminal nodes represent language

[6] The situation in Bulgarian YNE is rather complicated, as there are some restrictions on the type of sluices one can use (supposedly, only the presence of case-marking or a preposition makes YNE grammatical). This matter is left for further research.

independent notions and leaves are actual words of specific human languages.[7]

The syntactic component is a rule-based model that derives syntactic representations of sentences in form of HPSG-style trees augmented with non-tree links (control, anaphoric relations etc.). There is also a distinction between the *surface* and the *semantic* structure of a

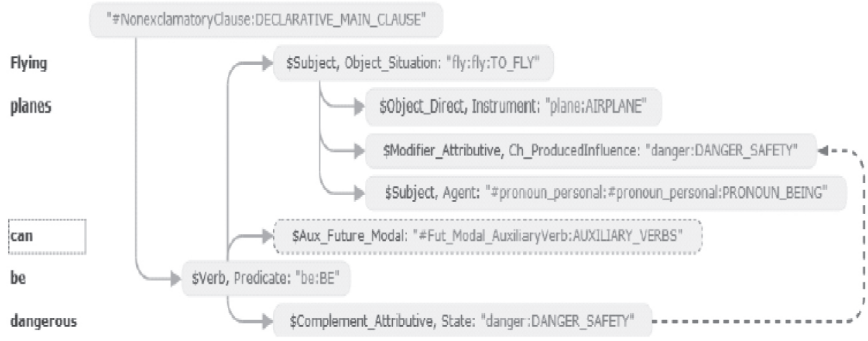

Fig. 7: An example of a syntactic representation

sentence. The surface structure is the familiar syntactic tree, including the well-known syntactic positions such as Direct Object, Subject and so on, whereas the Semantic Structure includes the semantic relationships between words, or the thematic roles in Chomskian terminology, e.g., Agent, Theme etc. The main goal of the syntactic parser is to match surface roles of words with their semantic slots and to derive a unified tree.

The statistical component represents data learned from monolingual and parallel corpora used for training the analysis algorithms and expanding the available formal semantic and syntactic descriptions.

5.2 Ellipsis Description in Compreno

One of the most astonishing advantages of Compreno is the possibility of ellipsis reconstruction using syntactic patterns. This mechanism helps to

[7] Currently Compreno contains descriptions of Russian, English, German and, partially, French and Chinese. For detailed description of the Semantic Hierarchy, see (Petrova 2013)

avoid problems connected with language asymmetry such as the one involving the YNE, absent in most European languages. Compreno already has descriptions of NP and VP ellipsis, gapping and sluicing.

A pattern for antecedent ellipsis is actually a rule for copying some material (the antecedent) in one well-defined context into some other well-defined place in the structure. "Well-defined" here means an elaborate and strict description of context including surface syntactic slots, grammatical features, mutual linear order of constituents. The better the context is defined, the less is the possibility that the pattern will succeed where it shouldn't.

5.3 YNE Description

As ellipsis patterns should be as specific as possible, the YNE was divided into four most frequent structural subcases. I will describe them schematically using English instead of Russian for simplicity. Ellipsis site is marked by *, antecedent is boldface:

1. Antecedent and YNE depend on the same matrix predicate:
   [When **I come to Moscow**], I never know, [for long LI *]
2. Antecedent and the parent node of YNE are conjuncts:
   [Someone **came**], but I don't know, [Peter LI *]
3. Antecedent is 1-step deep in the left conjunct:
   [I was cooking [while **she was eating**]], but I didn't see, [soup LI *]
4. Antecedent is 2-step deep in the left conjunct:
   [I know [a girl [who **speaks** some Slavic language]]], but I don't remember, [Russian LI *]

Let's look at a pattern for the second subcase of YNE:

y<Verb>	y – antecedent, <> - grammatical feature
[...	... - any constituents dependent on y
Core	linear position of verb y
<~Verb>	no verbs to the right of y
]	] – end of left conjunst
&	& - coordination
<Verb>	the right conjunct must be a verb
[Coord	Coord – a coordinate conjunction
...	... - any dependent constituents
Core	linear position of verb in right conjunct
...	

$Li_Clause:<@y<Verb>	dependent LI clause; <@y - copy y here
[CONST2	constant with allowed types of sluices
Core	linear position of copied verb
]	end of Li-clause
]	end of right conjunct

Now let's look at an example of translation to make the pattern clear:

(32) Она с кем-то видится, но я не знаю, с Петей ли.
Ona s kem-to viditsja, no ja ne znaju s Petej li.
She with smn meets but I NEG know with Peter LI
'She sees someone, but I don't know whether it is Peter she see.'

y<Verb>	*viditsja*
[…	*ona, s kem-to*
Core	linear position of verb *viditsja*
<~Verb>	-
]	
&	
<Verb>	*znaju*
[Coord	*no*
…	*ja, ne*
Core	linear position of verb in *znaju*
…	
$Li_Clause:<@y<Verb>	copy *viditsja* here
[CONST2	*s Petej*
Core	linear position of copied verb *viditsja*
]	

The actual translation for example (32) and the tree made by Compreno are as follows:

(33) She sees someone, but I do not know if she sees Petya.

In sum, there has been constructed four ellipsis patterns, which all have successfully worked for different sentences containing YNE. However, as YNE is a rare phenomenon, there has been no significant amelioration results on the scale of large corpora.

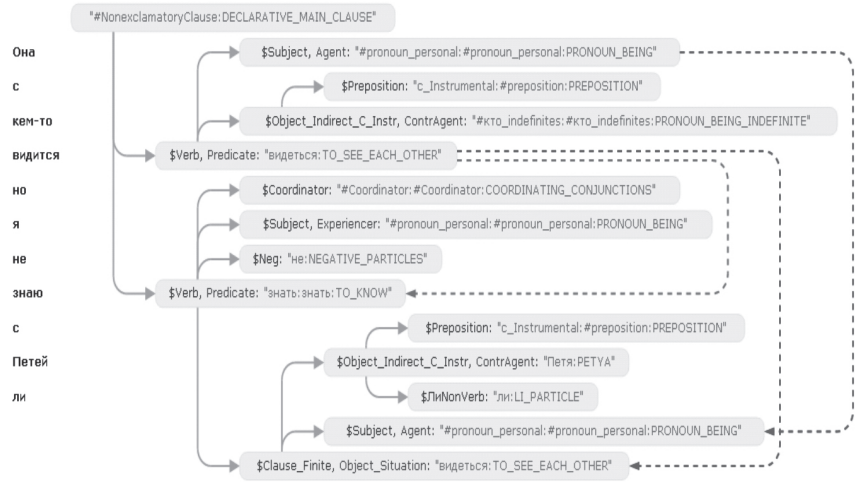

Fig. 8: Tree of an example of ellipsis reconstruction in Compreno. The reconstruction relationship (more precisely, a type of control) arrow marked with a star

6 Conclusions

In the theoretical part of the present article I have discussed a type of ellipsis analogous to sluicing present in embedded Russian yes/no questions (YNE). It has been successfully proved that YNE and sluicing are in fact two different types of one syntactic phenomenon, and new licensing conditions for both types of ellipsis were formulated, involving the Foc^0 with a +FOC feature as the new licensing head. Moreover, a typological prediction has been made that languages with focus-sensitive yes/no question marker will allow YNE. This prediction is borne out in Russian, Turkish and Bulgarian. Further research should be done to show whether this generalization is true for a wider range of languages. Moreover, the focus trigger analysis can make it possible to unify this research with broader work on different types of fragments.

The applied part of this work was dedicated to the description of ellipsis reconstruction using the tools of the system Compreno (ABBYY). The reconstruction of elided material helps to avoid language asymmetry problems in machine translation and allows for a better and fuller representation of sentence meaning. Unfortunately, the YNE

happens to be a rare phenomenon in Russian, so its reconstruction didn't give significant effects. However, the powerful tool of semantic ellipsis reconstruction in Compreno ameliorates considerably the analysis of other, much more frequent, types of elliptical constructions, such as NP and VP ellipsis, gapping and sluicing.

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Singular Nouns Looking like Plurals Cause More Agreement Attraction than Genuine Plurals *

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1 Introduction

Much work has been devoted to so-called attraction errors in subject-verb agreement, as in (1a). Across languages, number attraction errors were shown to arise more often in production and to cause smaller effects in comprehension than errors without attraction, as in (1b) (e.g. Bock & Miller, 1991; Clifton et al., 1999; Dillon et al., 2013; Eberhard et al., 2005; Franck et al., 2002, 2006; Hartsuiker et al. 2003; Pearlmutter et al., 1999; Solomon & Pearlmutter, 2004; Staub, 2009, 2010; Tanner et al., 2014; Vigliocco et al., 1995, 1996; Wagers et al., 2009).

(1) a. * The key to the cabinets were rusty.
b. * The key to the cabinet were rusty.

Attraction errors occur in spontaneous speech and can be elicited in experimental settings. Initially, it was suggested that the verb simply agrees with the linearly closest noun (e.g. Francis, 1986; Jespersen, 1924). However, later studies demonstrated that agreement attraction is a structural phenomenon. For example, Vigliocco and Nicol (1998)

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observed attraction errors in questions, e.g., "Are the helicopter for the flights safe?".

Many characteristics of attraction errors have been studied, but it was invariably noted that plural attractors cause a significant effect, while singular ones do not. The present study aims to show that singular nouns can cause attraction too – if they look like nominative plurals. However, the pattern is different from attraction with genuine plurals. Previous studies of languages where nouns are marked for case found that attraction was much stronger when the form of the plural attractor coincided with nominative plural, like in the German example (2a) as opposed to (2b) (Hartsuiker et al. 2003).

(2) a. die Stellungnahme gegen die
the$_{NOM.SG}$ position against the$_{ACC.PL(=NOM.PL)}$
Demonstrationen
demonstrations
'the position on the demonstrations'

b. die Stellungnahme zu den
the$_{NOM.SG}$ position on the$_{DAT.PL(\neq NOM.PL)}$
Demonstrationen
demonstrations
'the position against the demonstrations'

In Russian, nominative plural forms of some nouns coincide not only with accusative plural, but also with genitive singular, for example, *večerinki* from *večerinka* 'party'. Previous studies of number agreement attraction in Russian (Lorimor et al., 2008; Nicol & Wilson 1999; Yanovich & Fedorova, 2006) did not look at such syncretic forms. We studied agreement attraction with such forms in a production experiment and a reading experiment and discuss the implication for different models of attraction and for several discussions in morphology.

2 Experiment 1

2.1 Method

32 native speakers of Russian aged 18-29 took part in Experiment 1. All participants were naïve to the experimental hypotheses. We used a

modified version of the method designed by Vigliocco et al. (1995). Participants were asked to produce sentences combining a predicate and a subject they saw on a computer screen. In half of the trials, predicates did not agree with subjects in number. In the instruction given before the experiment started, participants were asked to change the predicate number in such cases to produce a correct sentence.

In all target stimuli, the predicates consisted of the 'to be' verb and an adjective or a participle, and the subjects contained the head noun, a preposition, and a dependent noun (a potential attractor), as shown in (3a-b)-(4a-b).[1] We used inanimate nouns of different genders and declensions. The head noun, the attractor noun and the predicate could appear in singular or in plural, yielding eight experimental conditions, shown in Table 1. We had two groups of 40 items with attractors in accusative and in genitive case. The form of accusative plural and genitive singular nouns was ambiguous with nominative plural. We had eight experimental lists with 80 target stimuli in one of the eight conditions (balanced across lists) and 140 fillers, which appeared in pseudo-random order (no more than two target items in a row).

(3) a. byla novoj / byli novymi
was$_{SG}$ new$_{SG}$ / were$_{PL}$ new$_{PL}$
'was new / were new'

b. trassa / trassy čerez pole / polja
highway$_{NOM.SG\,/\,NOM.PL}$ across field$_{ACC.SG\,/\,ACC.PL(=NOM.PL)}$
'the highway / highways across the field / fields'

(4) a. byla prostornoj / byli prostornymi
was$_{SG}$ spacious$_{SG}$ / were$_{PL}$ spacious$_{PL}$
'was spacious / were spacious'

b. komnata / komnaty dlja večerinki / večerinok
room$_{NOM.SG\,/\,NOM.PL}$ for party$_{GEN.SG(=NOM.PL)\,/\,GEN.PL}$
'the room / rooms for the party / parties'

[1] We opted for such predicates because we did not want them to contain any nouns and could not come up with single-verb predicates for all stimuli. As a result, two words inside the predicate were marked for number (we did not present number mismatches *inside* the predicate).

Group	Condition	Head	Attractor	Predicate
Acc	1 / 2 (S-Sacc+S/P)	Sg	Acc.Sg	Sg / Pl
Acc	3 / 4 (S-Pacc+S/P)	Sg	Acc.Pl (=Nom.Pl)	Sg / Pl
Acc	5 / 6 (P-Sacc+S/P)	Pl	Acc.Sg	Pl / Sg
Acc	7 / 8 (P-Pacc+S/P)	Pl	Acc.Pl (=Nom.Pl)	Pl / Sg
Gen	1 / 2 (S-Sgen+S/P)	Sg	Gen.Sg (=Nom.Pl)	Sg / Pl
Gen	3 / 4 (S-Pgen+S/P)	Sg	Gen.Pl	Sg / Pl
Gen	5 / 6 (P-Sgen+S/P)	Pl	Gen.Sg (=Nom.Pl)	Pl / Sg
Gen	7 / 8 (P-Pgen+S/P)	Pl	Gen.Pl	Pl / Sg

Table 1. Experimental conditions in Experiments 1 and 2.

The experiment was run on a PC using *Presentation* software (www.neurobs.com). In every trial, the predicate and then the subject appeared on the screen for 800 ms. Participants were asked to produce a complete sentence as fast as possible.[2] After that the experimenter pressed a key to initiate a 300 ms interval before the next trial. All responses were recorded.

2.2 Results and discussion

All participants' responses were assigned into one of the following categories: 'correct', 'number agreement error' and 'other errors' (the subject or the predicate were repeated incorrectly etc.). The distribution of responses in different conditions is shown in Table 2. In case of self-corrections, only the first variant was counted.

Errors of all types were more frequent in conditions in which predicates did not agree with the subjects in number, but were not limited to these conditions, so we will look at agreeing and non-agreeing conditions together. First of all, the previous studies reported very few or no mistakes without attraction (where the head and the dependent noun have the same number) and with plural heads, and Experiment 1 replicates this finding. Number agreement errors occurred only in the conditions with singular heads: there were 49 errors (15.3% responses in this condition) with accusative plural dependent nouns, 13 errors (4.1%) with genitive singular dependent nouns, 2 errors (0.6%) with genitive

[2] Usually, the subject phrase disappeared from the screen while participants were finishing pronouncing it. So it was already gone when they produced the predicate.

plural dependent nouns, and no errors with accusative singular dependent nouns (where no attraction is expected).

Group	Cond.	Head	Attractor	Correct	Agr. errors	Other errors
Acc	1 / 2	Sg	Acc.Sg	279 (147+132)	0	41 (13+28)
Acc	3 / 4	Sg	Acc.Pl (=Nom.Pl)	234 (137+97)	49 (8+41)	37 (15+22)
Acc	5 / 6	Pl	Acc.Sg	249 (134+115)	0	71 (26+45)
Acc	7 / 8	Pl	Acc.Pl (=Nom.Pl)	261 (143+118)	0	59 (17+42)
Gen	1 / 2	Sg	Gen.Sg (=Nom.Pl)	250 (133+117)	13 (3+10)	57 (24+33)
Gen	3 / 4	Sg	Gen.Pl	259 (135+124)	2 (0+2)	59 (25+34)
Gen	5 / 6	Pl	Gen.Sg (=Nom.Pl)	256 (135+121)	0	64 (25+39)
Gen	7 / 8	Pl	Gen.Pl	248 (128+120)	0	72 (32+40)

Table 2. The distribution of responses in Experiment 1. Responses in conditions with agreeing and non-agreeing predicates are in parentheses.

We modeled the data with a mixed-effects logistic regression in the *R* software (www.r-project.org) using the *glmer* function from the *lme4* package (Bates et al., 2015). The logistic regression evaluated the likelihood of an agreement attraction error (coded as 1) vs. a correct response (coded as 0). The case and number of the attractor were treated as fixed effects. For the predictors we used contrast coding: accusative was coded as 0.25, genitive was coded as -0.25; plural was coded as 0.25, singular was coded as -0.25. Random intercepts by participant and by item were also included in the model.[3]

The coefficient for the intercept was significant, reflecting that most responses were correct (*Wald Z* = -3.58, $p < 0.01$). The main effect of case did not reach significance, while the main effect of number did (*Wald Z* = 2.01, $p = 0.04$), indicating that there were more errors with plural attractors, as in the previous studies. The interaction of the case and number factors also was significant (*Wald Z* = 2.47, $p = 0.01$), showing that syncretism influences the error rate even more strongly. In

[3] This guarantees that errors are not limited to several particular experimental items or to several participants.

other words, looking like a nominative plural subject is more important for attraction than having the plural feature.

3 Experiment 2

3.1 Method

32 native speakers of Russian aged 18-35 who did not participate in Experiment 1 took part in Experiment 2. Target and filler sentences were similar to those from Experiment 1, but with four additional words at the end modifying the predicate (a preposition introducing a noun phrase). There were two groups of target stimuli: with attractors in accusative and in genitive case, and eight conditions, as in Experiment 1: the head noun, the attractor and the predicate could appear in singular or plural (thus, half of the conditions were ungrammatical). All conditions are listed in Table 1 above. A target sentence in two experimental conditions is shown in (5a-b).

(5) a. S-Pacc+S (grammatical)
Trassa čerez polja byla novoj
highway$_{NOM.SG}$ across field$_{ACC.PL}$ was$_{SG}$ new$_{SG}$
po merkam mestnyx zitelej.
by standards (of) local people$_{GEN.PL}$
'The highway across the fields was new by the standards of local people.'

b. S-Sacc+P (ungrammatical)
Trassa čerez pole byli novymi
highway$_{NOM.SG}$ across field$_{ACC.SG}$ were$_{PL}$ new$_{PL}$
'The highway across the field were new.'

Sentences in different conditions were balanced across eight experimental lists. Every list contained 80 target sentences and 150 fillers, which were always grammatically correct. Every list started with five filler sentences and then target and filler sentences were pseudo-randomized (at most, two target sentences with errors in a row).

The experiment was run on a PC using *Presentation* software (www.neurobs.com). We used the word-by-word self-paced reading methodology. Each trial began with a screen presenting a sentence in

which the words were masked by dashes while spaces and punctuation remained intact. Each time the participant pressed the space bar, a word was revealed, the previous word was re-masked, and RTs were measured. Comprehension questions with a choice of two answers were asked after one third of randomly preselected sentences to ensure that the participants were reading properly.

We analyzed participants' question-answering accuracy and reading times. On average, participants answered incorrectly only 6.3% questions (14.8% at most). Given the low number of mistakes, a breakdown of RTs into correct and incorrect question trials was not done. Reading times that exceeded a threshold of 2.5 standard deviations, by region and condition, were excluded. In total, 1.6% of the data was excluded (at most 3.8% per region and condition).

3.2 Results and discussion

Average RTs per region in different conditions are shown in Figures 1-2.

Using *IBM SPSS* software (www.ibm.com/software/analytics/ spss), 2 × 2 × 2 repeated-measures ANOVAs were computed on participant mean reading times across items (F_1) and on item means across participants (F_2). The factors were the number of the head ('head number'), the number of the attractor ('attractor number') and grammaticality (whether the number of the verb matched the number of the head noun). Sentences in the accusative and genitive groups were analyzed separately.

In the first region (head noun), the head number factor was significant in the accusative group (singular mean 332.8 ms, plural mean 361.3 ms; $F_1(1,31) = 25.09$, $p < 0.01$; $F_2(1,39) = 7.99$, $p = 0.01$) and approached significance in the genitive group (singular mean 344.8 ms, plural mean 364.8 ms; $F_1(1,31) = 11.71$, $p < 0.01$; $F_2(1,39) = 3.25$, $p = 0.08$). No factors were significant in the very short second region (preposition). In the region 3 (attractor), the attractor number became significant in both groups (accusative group: singular mean 313.4 ms, plural mean 331.6 ms; $F_1(1,31) = 10.30$, $p < 0.01$; $F_2(1,39) = 7.01$, $p = 0.01$; genitive group: singular mean 321.6 ms, plural mean 338.2 ms; $F_1(1,31) = 10.57$, $p < 0.01$; $F_2(1,39) = 7.66$, $p = 0.01$). The head number was significant only in by-subject analysis (accusative group: singular mean 317.7 ms, plural mean 327.3 ms; $F_1(1,31) = 4.85$, $p = 0.04$; $F_2(1,39) = 1.46$, $p = 0.23$; genitive group: singular mean 323.6 ms, plural

mean 336.3 ms; $F_1(1,31) = 5.59$, $p = 0.03$; $F_2(1,39) = 1.61$, $p = 0.21$). These results replicate previous findings showing that plural nouns take longer to be processed (in the agreement attraction literature, this phenomenon is discussed in detail by Wagers et al. (2009)).

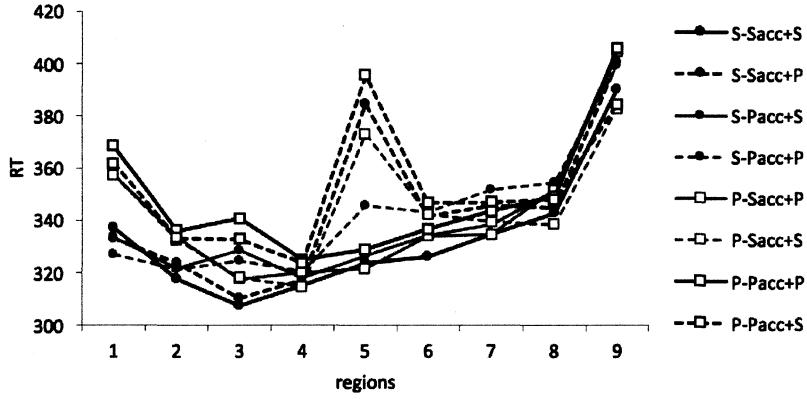

Figure 1. Average RTs per region (in ms) in the accusative group. Regions: $N1_1$ $Prep_2$ $N2_3$ was/were$_4$ Adj/Part$_5$ + a four-word PP.

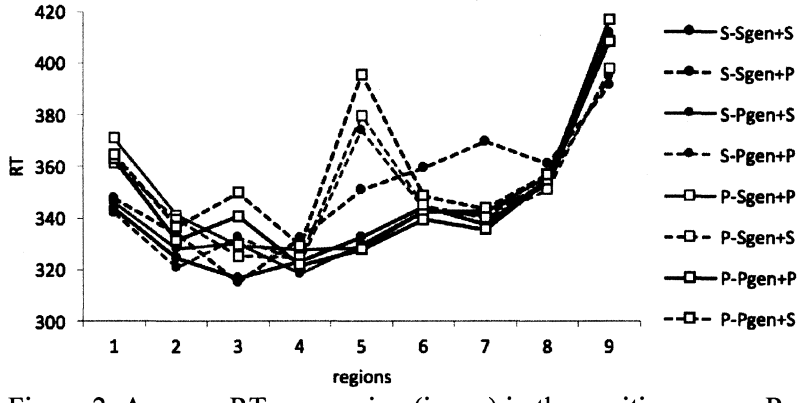

Figure 2. Average RTs per region (in ms) in the genitive group. Regions: $N1_1$ $Prep_2$ $N2_3$ was/were$_4$ Adj/Part$_5$ + a four-word PP.

The fourth region ('to be' verb) is where the number agreement error appears in ungrammatical conditions. However, no factors reached significance in this short region. The fifth region (adjective or participle, which is also inflected for number) showed a main effect of

grammaticality in both groups (accusative group: grammatical mean 325.2 ms, ungrammatical mean 374.8 ms; $F_1(1,31) = 44.83$, $p < 0.01$; $F_2(1,39) = 31.56$, $p < 0.01$; genitive group: grammatical mean 329.7 ms, ungrammatical mean 374.9 ms; $F_1(1,31) = 38.04$, $p < 0.01$; $F_2(1,39) = 17.05$, $p < 0.01$).

In the accusative group, the three-way interaction of grammaticality, dependent number, and head number was also significant ($F_1(1,31) = 12.84$, $p < 0.01$; $F_2(1,39) = 4.68$, $p = 0.04$): the delay in the ungrammatical condition with a singular head and a plural dependent noun was much smaller than in the other three. This pattern has been observed in the previous comprehension studies of number agreement attraction. The interaction of head number and dependent number approached significance ($F_1(1,31) = 8.68$, $p = 0.01$; $F_2(1,39) = 3.83$, $p = 0.06$): sentences where they did not coincide tended to have longer reading times compared to the sentences where they were the same.

As in Experiment 1, the main question was whether the pattern in the genitive group would differ from this established pattern. In particular, we could expect attraction in two conditions with singular heads: genitive plural attractors have the plural feature, but their form does not coincide with nominative plural, while for genitive singular attractors, the opposite is true. In Experiment 1, the attraction effect was larger in the second condition (but still smaller than with accusative plural attractors). Average reading times in region 5 show a similar tendency, but it does not reach statistical significance. Apart from a main effect of grammaticality, only the interaction between subject number and grammaticality was significant in by-subject analysis ($F_1(1,31) = 10.07$, $p < 0.01$; $F_2(1,39) = 3.28$, $p = 0.08$), indicating a tendency for both ungrammatical conditions with singular heads to be read faster. When the two ungrammatical conditions with singular heads were compared directly (using one-way repeated-measures ANOVAs), the difference was marginally significant (singular attractor mean 350.6 ms, plural attractor mean 374.1 ms; $F_1(1,31) = 4.43$, $p = 0.04$; $F_2(1,39) = 3.34$, $p = 0.08$).

Regions 6-9 contained four words modifying the adjective or participle: a preposition and three nouns and adjectives. In the accusative group, no differences were significant in these regions, i.e. the effect of the violation was local. In the genitive group, no differences were significant in the short sixth region (preposition) and in the two last

regions, but in the region 7, the interaction of the three experimental factors was significant ($F_1(1,31) = 7.52$, $p = 0.01$; $F_2(1,39) = 4.01$, $p = 0.05$). The ungrammatical condition with a singular head and genitive singular attractor was read slower than the others, which can be taken as an indication of revision. Nothing similar has been observed for accusative plural attractors either in the present study or in the other experiments reported in the literature.

4 General discussion

In the previous literature on number agreement attraction, one observation that was consistent across various production and comprehension studies on different languages was the asymmetry between singular and plural: only plural attractors were found to trigger significant effects. When the role of morphological ambiguity was discovered (Hartsuiker et al. 2003), it was assumed to be a secondary factor that 'boosts' the effect. In the two experiments reported in this paper, the two factors, carrying the plural feature and being morphologically ambiguous, are assessed independently for the first time.

The production experiment demonstrated that, contrary to what was previously assumed, morphological ambiguity is a more important factor. Syncretic genitive singular forms triggered more attraction errors than non-syncretic genitive plural forms, while syncretic accusative plural forms were the most effective attractors. As far as we know, this is the first study demonstrating number agreement attraction with singular attractors.

Average reading times in the comprehension experiment showed the same tendency. Ungrammatical sentences with accusative plural attractors were read significantly faster than all other ungrammatical sentences in the accusative group, while the difference between various types of genitive attractors was only marginally significant.[4] Notably, although ungrammatical sentences with genitive singular attractors

[4] Sentences with accusative and genitive attractors could not be compared directly. They contained different lexical material. Using the same words in accusative and genitive sentences was hardly possible because of the different semantics introduced by the prepositions.

initially exhibited the smallest violation effect in their group, they were read significantly slower than all other sentences in the following regions. We hypothesize that the readers might be revising their initial decision about these errors, unlike in the canonical case with accusative plural attractors, but could not test this hypothesis independently so far. Now let us consider some implications of these results for alternative models of agreement attraction and for different approaches to syncretism and ambiguity processing.

4.1 Approaches to agreement attraction

Two major approaches to agreement attraction can be identified in the literature. According to the first approach, which we will further call representational (e.g. Brehm & Bock, 2013; Eberhard et al., 2005; Franck et al., 2002; Nicol et al., 1997; Staub, 2009, 2010; Vigliocco & Nicol 1998), agreement attraction takes place because the mental representation of the number feature of the subject NP is faulty or ambiguous. Some authors assume that the number feature can "percolate" from the embedded NP to the subject NP, which normally receives its features from its head. The others, relying primarily on the Marking and Morphing model suggested by Eberhard et al. (2005), argue that the number value of the subject NP is a continuum, i.e. it can be more or less plural. The more plural is the subject NP, the higher is the possibility of choosing a plural verb. This plurality depends on such properties of the subject NP as a whole and its head as collectivity, distributivity etc.

The second approach (e.g. Badecker & Kuminiak, 2007; Dillon et al., 2013; Lewis & Vasishth, 2005; Solomon & Pearlmutter, 2004; Wagers et al., 2009) claims that the number feature on the subject NP is always represented unambiguously and correctly, and attraction errors arise when the subject NP is accessed to determine the number on the agreeing verb because several nouns are simultaneously active. The authors adopting this approach usually assume that the agreement controller is found via cue-based retrieval (Lewis & Vasishth, 2005; McElree, 2006): we query the memory with a set of cues (e.g. "number: plural", "case: nominative" etc.) and select an element that matches the maximum number of cues. This process is not error-free, and a wrong element can sometimes be retrieved.

As Wagers et al. (2009) note, two scenarios are possible both in production and in comprehension. On the one hand, cue-based retrieval may be initiated whenever we reach an agreeing verb form. On the other hand, we may predict the number of the verb relying on the subject NP and initiate the retrieval only when our expectations are violated (in comprehension, this would be the case in ungrammatical sentences, in production, this would be possible if a wrong verb form can sometimes be spuriously generated). However, teasing these scenarios apart is not relevant for our discussion, so we will not go into further details.

Our data are hard to explain in the representational approach. In case of genitive singular attractors, there is no plural feature that could percolate somewhere. There is in general no semantic or formal plurality in the subject NP, so its number representation should not be ambiguous according to the Marking and Morphing model. The retrieval approach is better suited to account for our data, but they call for several modifications. Firstly, they show that retrieval cues can tap into alternative feature sets of syncretic forms (this problem will be addressed in more detail below when ambiguity is discussed). Secondly, previous descriptions of cue-based retrieval suggest that if no noun matches the cues perfectly, several imperfect matches are considered. For example, reading the Russian sentence in (6), we start looking for a nominative plural noun when we reach the verb.[5] There is no perfect match, but the head is nominative and the attractor is plural, so they compete and a wrong noun may be retrieved.

(6) Trassa čerez polja opusteli.
highway$_{NOM.SG}$ across field$_{ACC.PL(=NOM.PL)}$ emptied$_{PL}$
'The highway across the fields got empty (in plural).'

[5] Wagers et al. (2009) include "role: subject" into the set of potential cues. However, we would rather assume that being more or less deeply embedded in the subject NP determines the general accessibility of the noun for retrieval. If the system could effectively identify the head of the subject NP during retrieval, no errors would arise. The fact that it cannot always do so is remarkable in itself, given how easy it is to find the head when we look at syntactic structure. Maybe, the reason is that being a head is not a feature and therefore not a property that can be used in cue-based retrieval.

Russian sentences like (7a-b) suggest that the picture is slightly different. In (7a), the head is nominative and the attractor is plural, but there is virtually no attraction. This suggests that the cues are used as a set: we look for something that has both features. Alternative feature sets of syncretic forms, like in (7b), can also be accessed, but are less readily available. Thus, larger effects with accusative plural attractors can be explained by the fact that they have a plural feature in their own set.

(7) a. Komnata dlja večerinok opusteli.
room$_{NOM.SG}$ for party$_{GEN.PL}$ emptied$_{PL}$
'The room for the parties got empty (in singular).'

b. Komnata dlja večerinki opusteli.
room$_{NOM.SG}$ for party$_{GEN.SG(=NOM.PL)}$ emptied$_{PL}$
'The room for the party got empty (in plural).'

The fact that the cues are used as a set can be taken as another piece of evidence against the representational account. In principle, the number feature from an alternative feature could be assumed to percolate to mark the whole subject NP, although this assumption appears to be much more questionable than the claim that alternative feature sets can be accessible for retrieval. But then it would still be hard to explain why its percolation depends on other features from the set.

Finally, we found an indication that retrieval errors might be subsequently revised if the retrieved noun does not contain a plural feature and is only ambiguous with nominative plural. If our interpretation of the relevant data is on the right track, the retrieval process includes at least two stages: firstly we access a noun and then take a closer look at its relevant features.

4.2 Views on syncretism and ambiguity processing

In theoretical morphology, there is a wide range of approaches to syncretism that explain it through underspecification, define some forms through others etc. (e.g. Baerman et al., 2005; Blevins, 1995; Bobaljik, 2002; Müller, 2011; Stump, 2001; Zwicky, 1991). Importantly, almost all theories draw a distinction between systematic and accidental syncretism, and the syncretism between nominative and accusative plural in Russian is regarded as an example of the former, while the syncretism

between nominative plural and genitive singular is believed to be an example of the latter.

This makes it harder to explain our data without appealing to the actual word form, rather than to underspecified or interconnected feature sets. Since we found attraction with genitive singular forms not only in comprehension, but also in production, where we start out with features and not with forms, this can be taken as an argument against non-lexicalist frameworks assuming that syntax operates with sublexical units and actual words forms are glued together or inserted at the last stage. The form should be inserted relatively early and be allowed to play a role in subsequent syntactic processes: alternative feature sets activated by it should be at least marginally accessible for retrieval.

Finally, our data let us make a small contribution to the discussion of ambiguity processing. For many decades, locally and globally ambiguous sentences have served as a testing ground for parsing models (Clifton & Staub, 2008; Frazier & Fodor, 1978; Frazier & Rayner, 1982; McDonald, 1994; Swets et al., 2008; van Gompel et al., 2001, 2005, among many others). The sources of ambiguity could be different, but in many cases it was created by morphologically ambiguous forms, as in the classical example in (8).

(8) The horse raced past the barn fell.

Notably, all previous studies looking at morphologically ambiguous forms from this perspective analysed constructions where at least locally, two interpretations are possible (for example, (8) remains ambiguous until the reader reaches the verb *fell*). The goal was to determine which interpretation is chosen in different constructions depending on various factors, how ambiguity resolution proceeds, how reanalysis is implemented, if it is necessary etc.

In the sentences used in our study, the ambiguity should be resolved immediately because the preposition preceding the embedded noun requires a certain case. Nevertheless, we demonstrated that alternative feature sets are available at the stage when cue-based retrieval is initiated at the verb. We believe that they get reactivated rather than remain active. Firstly, various studies show that, even if two interpretations are possible from the syntactic point of view, the resolution is very fast if

one of them is strongly supported by other factors. In our case, no alternative interpretations are possible in principle.

Secondly, in another study (Slioussar & Cherepovskaia, 2014) we looked at Russian sentences like (9a-b) and demonstrated that readers' reaction to the case errors on the noun depends on the morphological ambiguity of the adjective or participle modifying it. Notably, the effect persisted even when three words were inserted between the noun and the ambiguous form, which definitely points to reactivation. As far as we know, such instances of reactivation of alternative feature sets that are not initiated by reanalysis have not been previously discussed in the literature. We plan to study them in more detail in further experiments.

(9) a. Listja na pešexodnyx
leaves on pedestrian$_{\text{LOC.PL(=GEN.PL)}}$
dorožkax / dorožek / dorožkam
path$_{\text{LOC.PL / GEN.PL / DAT.PL}}$
'Leaves on the pedestian paths'

b. Listja na iduščix vdol' krutogo berega
leaves on going$_{\text{LOC.PL(=GEN.PL)}}$ along steep bank
dorožkax / dorožek / dorožkam
path$_{\text{LOC.PL / GEN.PL / DAT.PL}}$
'Leaves on the paths going along the steep bank'

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Deriving Multiple Left Branch Extraction*

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This paper is concerned with multiple Left Branch Extraction (LBE) in Serbo-Croatian (SC), where more than one left branch element is extracted out of NP, as in (1).

(1) a. *Onu/svoju/čiju$_k$* je on *staru$_i$* prodao [$_{NP}$ t_k t_i kuću]
that /self's/whose is he old sold house
'He sold that/his old house./ Whose old house did he sell?'
b. *Jedan$_k$* je to *strašno$_i$* bio [$_{NP}$ t_k t_i težak zadatak]
one is that frightfully been difficult task
'That was one frightfully difficult task.'

The goals of the paper are two-fold. First, I show that the grammar provides two ways of deriving multiple LBE. In addition to the *tucking-in* option discussed in Bošković (2014, 2016), where multiple left branch (LB) elements target multiple Specs of the same head, I show that multiple LBE can also involve *splitting*, where they target different projections, as in examples like (1). Second, I argue that instances of splitting multiple LBE can be felicitously derived, even though at first sight, they seem to pose problems for the locality of movement. In particular, they seem to involve a Phase Impenetrability Condition (PIC) (Chomsky 2000, 2001) violation. I argue that nevertheless, they can be derived if we crucially assume that PIC violations can be repaired by

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copy deletion at PF (see Bošković 2011, 2013, among others) and given Bošković's (2014, 2016) contextual approach to phasal edgehood determination. However, this state of affairs will require us to revisit Bošković's analysis of the tucking-in option in order to identify and explain the properties that differentiate it from the splitting option.

The paper is organized as follows. After briefly summarizing Bošković's analysis of the tucking-in option of multiple LBE in Section 1, in Section 2, I present my analysis of cases like (1a) that involve the splitting option. In Section 3, I show that the existence of this option requires a modification of Bošković's analysis of tucking-in multiple LBE and propose it. In Section 4, I show that the proposed analysis of the two multiple LBE options can be extended to examples like (1b), which involve LBE of an AdjP modifying a noun and an AdvP modifier of another AdjP that modifies the same noun. Section 5 discusses some implications of the proposed analysis for the current approaches to LBE, while Section 6 is a conclusion.

1 Multiple LBE: Tucking-in (Bošković 2014, 2016)

Bošković (2014, 2016) shows that multiple LBE is possible in examples like (2):

(2) *Onu*$_k$ *staru*$_i$ je on prodao [$_{NP}$ t$_k$ t$_i$ kuću].
that old is he sold house
'He sold that old house.'

Such examples involve LBE of two AdjP *onu* 'that' and *staru* 'old' that modify the noun *kuću* 'house'. Given that both AdjPs precede the second position clitic Aux *je* 'is', Bošković concludes that they must be located in the same phrase. Otherwise, a second position effect would ensue, given that the clitic would not be in the second position, and the sentence would be ungrammatical. Bošković accounts for cases like (2) in the following way. First, he makes a widely held assumption that SC nominal phrases are NPs, rather than DPs (see Corver 1992, Zlatić 1997, Stjepanović 1998, Trenkić 2004, Bošković 2005, 2012, Marelj 2011, Despić 2011, Runić 2014, Takahashi 2013, Talić 2013, 2015, among others), and that SC NPs can be phases (Bošković 2008, 2012, among others). Furthermore, AdjPs are adjuncts/Specs of NPs (Zlatić 1997,

Stjepanović 1998, Bošković 2005, 2012, among others). Given these assumptions, Bošković argues that each AdjP in (2) is LBE-ed from the adjunct/Spec position of NP separately, and targets multiple Specs of the same head, as illustrated in (3). In other words, such cases are not derived by the remnant movement analysis (see Franks and Progovac 1994), where *kuću* is extracted first and the remnant containing *onu staru* is moved over it.

(3) [[*onu*$_k$ [*staru*$_i$ [F]]] je on prodao [$_{NP}$ t$_k$ [$_{NP}$ t$_i$ [$_{NP}$ kuću]]]]

Bošković further shows that *staru* can crucially be extracted only if *onu* is extracted as well. Thus, examples like (4), where *staru* is extracted out of NP, but *onu* is not, are ungrammatical.

(4) a. * On je *staru*$_i$ prodao [$_{NP}$ *onu* [$_{NP}$ t$_i$ kuću]]
he is old sold that house
'He sold that old house.'

b. ?**Staru*$_i$ je on prodao [$_{NP}$ *onu* [$_{NP}$ t$_i$ kuću]]
old is he sold that house
'He sold that old house.'

According to Bošković, the contrast between examples like (2) and (4) cannot be due to Closest Attract (Superiority), given that LBE is not subject to this constraint. Rather, he argues that the movement of *staru* over *onu* in (4) is banned because *staru* does not move from a phasal edge, and, thus, it violates the PIC. The crucial ingredient in Bošković's analysis is the contextual approach to phasal edgehood, for which he argued on independent grounds. Under this approach, whether Spec,XP/XP adjunct counts as the edge of a phase depends on whether X has other Specs/XP adjuncts. In case of multiple Specs/adjuncts of a phase head, only the outmost Spec/adjunct counts as the edge. Furthermore, moving the outmost Spec/adjunct away can affect the edge status of the remaining Specs/adjuncts, allowing the remaining outmost one to count as the phasal edge. Now, going back to the example in (4), recall that AdjP modifiers of nouns are NP adjunct/Specs. Given that NP is a phase, and given the contextual approach to the phasal edgehood, then in (4), *onu* is a phasal edge, while *staru* is not. Since *staru* does not move from the edge of a phase, the PIC is violated. Grammatical

examples like (2), on the other hand, are derived without such a violation. In (2), the outmost adjunct/Spec (*onu*) at the edge of the NP phase moves first. This leaves the initially lower adjunct (*staru)* at the edge, which then also becomes accessible for movement.

(5) [[onu_k [F]] je prodao [$_{NP}$ t_k [$_{NP}$ ***staru***$_i$ [$_{NP}$ kuću]]]]

NP phase edge

Thus, *staru* can move without violating the PIC.

Bošković also notes an ordering constraint on multiple LBE with examples like (2):

(6) Extracting multiple AdjPs from the left edge of NP is ok, as long as the original order of AdjPs is preserved.

This constraint predicts that the following example is ungrammatical, and it is.

(7) a. * $Staru_i$ onu_k je on prodao [$_{NP}$ t_k t_i kuću]
old that is he sold house
'He sold that old house.'

Bošković argues that the ordering restriction is obtained because *staru* must undergo Richards (2001)-style tucking-in below *onu*, illustrated in (8).

(8) [onu_k [$staru_i$ [F]]] je on prodao [$_{NP}$ t_k [$_{NP}$ t_i [$_{NP}$ kuću]]]

So, in order to explain examples like (2) and derive the tucking-in option for multiple LBE, according to Bošković, we crucially need the contextual approach to phasal edgehood. In the next section, I show that multiple LBE is not only allowed when AdjPs target multiple Specs of the same head, but it is also allowed in cases where they target different projections. I will show that such sentences can be derived, despite the fact that at first sight they pose a problem for the PIC.

2 Multiple LBE: Splitting

Examples like (1a) show that AdjPs *onu* and *staru* do not need to target the same projection. In (1a), both the second position clitic Aux *je* 'is' and the subject NP *on* 'he' intervene between the two LBE-ed AdjPs, thus confirming that they are in different projections. However, the grammaticality of such examples is unexpected, given that they involve a violation of the PIC. Consider the point in the derivation of (1a) in (9).

(9) [[F] ... prodao [$_{NP}$ ***onu***$_k$ [$_{NP}$ *staru*$_i$ [$_{NP}$ kuću]]]]

At this point, only *onu* is accessible for movement, since it is at the outmost edge. However, given strict cyclicity, the linear order of AdjPs in (1a) reveals that *staru* has moved first, with a later movement of *onu* to a higher projection. Thus, (1a) is expected to be ungrammatical, just as the examples in (4), because it violates the PIC. Why is, then, (1a) grammatical?

Crucial to explaining the contrast between examples like (1a) and examples like (4) is Bošković's generalization that the lower AdjP *staru* can move over the higher AdjP *onu* only if the higher *onu* undergoes movement. The contrast in grammaticality between these examples confirms the generalization. In (1a), both AdjPs undergo movement, while in (4), only *staru* does. So, just as in the case of examples like (4), the lower phrase in (1a) can undergo movement, only if the higher does. The only difference between (1a) and (2) is the order of movement of the two AdjPs. In (1a), it is the lower phrase that moves first, followed by the higher one, while the reverse is true of (2). The question is, why is this the case, i.e., why is it possible for the lower AdjP to move over the higher one, only if the higher one undergoes movement later.

I show that the answer to this question crucially rests on the proposal that PIC violations can be rescued by copy deletion at PF (Bošković 2011, 2014, 2016), as well as on the contextual determination of phasal edges. With respect to the former, Bošković (2011, 2014, 2016) argues that certain types of locality violations, including PIC violations, can be rescued by copy deletion at PF by extending Chomsky's (1972) rescue-by-PF-deletion account of Ross's (1969) island amelioration under sluicing to PF copy deletion. More precisely, Ross (1969) observed that island violations can be rescued by ellipsis, as shown in (10).

(10) a. *Ben will be mad if Abby talks to one of the teachers, but she couldn't remember **[which (of the teachers)]**$_i$ Ben will be mad **[if she talks to t_i]**.
b. Ben will be mad if Abby talks to one of the teachers, but she couldn't remember which$_i$ ~~Ben will be mad [if she talks to t_i].~~
— (Merchant 2001)

Chomsky (1972) formulates a rescue-by-PF-deletion account of island amelioration effects under sluicing. First, he assumes that when an element crosses an island, a * (a # in Chomsky 1972) is assigned to the island. If the * remains in the final structure, a violation incurs. If the *-marked element is deleted before it is pronounced, the derivation is rescued. If we apply this account to examples like (10), when *wh*-movement crosses the adjunct island, the island is *-marked in both (10a) and (10b). Given that in (10a) the * is present in the final PF representation, the derivation crashes. However, in (10b) the same problem does not arise, given that the *-marked island is deleted at PF.

Bošković (2014, 2016) proposes that Chomsky's (1972) account of island amelioration effects under sluicing can be extended to repairing violations of PIC in cases where the phase head has multiple Specs or adjuncts. More precisely, following a suggestion by A. Talić, Bošković proposes that in such cases when an element moves out of a phase XP in violation of PIC, a * is placed on the outmost edge (adjunct/Spec). If the adjunct/Spec is turned into a copy that is deleted at PF, the derivation can be rescued. Bošković (2014, 2016) suggests that the Dutch contrast between (11a) and (11b) below, which involve *wh*-movement of DO in ditransitives, can be accounted for by this PF repair mechanism. First, as shown by den Dikken (1995), in Dutch, IO must object shift in order for DO to undergo *wh*-movement. Thus, (11a) is grammatical because IO undergoes object shift, as evidenced by the fact that it precedes AdvP *waarschijnlijk* 'probably'. Leaving IO in situ below AdvP, as in (11b), leads to ungrammaticality.

(11)a. Wat zal Jan Marie waarschijnlijk geven?
what will Jan Marie probably give
'What will Jan probably give to Marie?'
b.?*Wat zal an waarschijnlijk Marie geven? (den Dikken 1995)

Furthermore, following Zwart (1993), Bošković assumes that prior to object shift to a position above vP, IO and DO are in separate Spec,vPs with IO higher than DO:

(12) ...[$_{vP}$ IO DO]

Given this assumption, if IO does not object shift, DO cannot move, since it will violate PIC, as schematically represented in (13). This is because DO will move out of the vP phase over IO, which is an outer Spec that counts as the phasal edge.

(13) *[$_{CP}$ DO ... [$_{vP}$ IO t...]] PIC violation

However, if IO undergoes object shift, it will leave a copy in Spec,vP. Once DO undergoes *wh*-movement, it violates PIC since it moves out of the vP phase, but it is not at its edge. Bošković proposes that, at this point, the violation is recorded by placing a * on the outer edge, in this case the copy of IO:

(14) [$_{CP}$ DO$_k$ [$_{TP}$... IO$_i$... [$_{vP}$ t$_i$* t$_k$...]]] → overt syntax

Once copy deletion occurs at PF, this copy of IO is deleted, together with the * on it, and the derivation is rescued:

(15) [$_{CP}$ DO$_k$ [$_{TP}$... IO$_i$... [$_{vP}$ ~~t$_i$*~~ t$_k$...]]] → PF

Going back to the question of why in SC examples above, *staru* can move over the higher Spec *onu* only if *onu* undergoes movement, and why the order of LBE-ed AdjPs in (1a) is grammatical, we have an answer. In cases like (1a), in narrow syntax, *staru* moves over the outmost adjunct *onu* out of the NP phase in violation of PIC. At this point, *onu* is marked with a *:

(16) staru$_i$...[$_{NP}$ onu* t$_i$...]

Onu then undergoes movement over *staru* to a higher projection, leaving a copy with a * on it:[1]

(17) $onu_k \ldots staru_i .. [_{NP}\ t_k{*}\ t_i]$

At PF, the copy of *onu* with the * is deleted, and the derivation is rescued.

(18) $onu_k \ldots staru_i .. [_{NP}\ \cancel{t_k{*}}\ t_i]$

Thus, split LBE can exist because PIC violations can be rescued by copy deletion at PF.[2]

One questions at this point, though, is after *staru* moves over *onu*, why cannot *onu* tuck in under *staru*? As the example in (7) shows, this order is ungrammatical, so we have to make sure that such examples are not ruled in. I take up this question in the next section. As we will see, the answer to this question will also require us to revisit the tucking-in option of multiple LBE and propose a modification of its analysis.

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[1] I assume that * is not copied under movement. For a discussion on when *s are copied under movement, see Bošković (2011).

[2] Note that there may be a difference between examples like (1a) and (11a) in what exactly the inner edge element crosses at the point when it moves out of the phase, depending on what element in multiple Specs in (11a) moves first. In (1a), the inner edge element (*staru*) undergoes movement over the outer edge element (*onu*), and the outer edge element then undergoes movement over it, in compliance with strict cyclicity. So, in this case, at the point of leaving the vP phase, *staru* crosses *onu*, and *onu* is turned into a copy at a later point. In (11a), however, if the inner edge element moves first, just as in (1a), then strict cyclicity is violated, as pointed out by a reviewer, given that IO moves *within* the structure already created by the movement of DO to Spec,CP. However, if it is the outer edge (IO) that moves first with the subsequent movement of the inner edge (DO) to Spec,CP, in compliance with strict cyclicity, then DO crosses a copy of IO already at the point of moving out of the vP phase. The outer edge also moves first in examples like (2).

3 Tucking-in Revisited

In the previous section, we have seen that crucial to the derivation of the splitting option of multiple LBE is the contextual determination of phasal edgehood and the PF copy deletion mechanism of PIC violation repair. However, while these mechanisms are successful in accounting for the existence of splitting multiple LBE in SC, we have to make sure that they do not over-generate, in other words, that all ungrammatical examples of multiple LBE that we have seen so far are still ruled out.

In light of the derivation of splitting multiple LBE in the previous section, ungrammatical sentences like (7), which involve tucking-in multiple LBE, become worrisome. This is because there seems to be nothing up to this point that would prevent their derivation. In particular, consider the derivation in (19) that successfully derives (7), given the mechanisms proposed in the previous section.

(19) a. *Staru* first moves out of the NP phase to a higher projection, crossing the outer adjunct *onu* in violation of PIC. *Onu* is marked with a *:
staru$_i$...[$_{NP}$ *onu** t_i...]
b. *Onu* then moves and tucks in under *staru*:
[[*staru*$_i$ *onu*$_k$ [F]]...[$_{NP}$ t_k* t_i]]
c. At PF, the starred copy of *onu* is deleted, rescuing the derivation:
[[*staru*$_i$ *onu*$_k$.[F]]...[$_{NP}$ ~~t_k*~~ t_i]]

As the example in (7) shows, this order of AdjPs under tucking-in is ungrammatical, so what is responsible for ruling it out? In order to give an answer to this question, I will first consider a difference between tucking-in and splitting with respect to the derived order of LBE-ed AdjPs.

Recall that what the contrast between examples like (7) and those like (2) shows is that the tucking-in option must preserve the original order of the LBE-ed elements. Interestingly, the splitting multiple LBE option does not have this requirement. So, a sentence like (20), where *staru* and *onu* target different projections and with *staru* higher than *onu*, is grammatical. It is felicitous, for example, in the context where *staru* is emphasized or contrastively focused, while *onu* is not.

(20) *Staru*$_k$ je on *onu*$_i$ prodao [t$_i$ t$_k$ kuću] (ne novu).
old is he that sold house not new
'He sold that old house (not that new one).'

Note that the movement of the two AdjPs yields a grammatical result despite the fact that it causes a PIC violation in overt syntax, given the PF copy deletion mechanism that rescues this violation. Their derivation proceeds in a similar way as the derivation of Dutch examples in (11). The higher AdjP *onu* moves first. The lower AdjP *staru* moves next out of NP phase over the in-situ copy of *onu,* which is at the edge of the phase, and lands in a projection higher than the projection to which *onu* has been LBE-ed. Given that this movement of *staru* crosses the phasal NP edge, it violates PIC. As a result, the in-situ copy of *onu* is marked with a *. Once this copy is deleted at PF, the derivation is repaired.

The question, however, is why there is this difference in the restriction on the derived order of LB elements between tucking-in and splitting? I propose that the answer to this question lies in a property of the feature that is checked by multiple LBE-ed elements under tucking-in. More precisely, I propose that the feature that is checked by both LBE-ed elements in tucking-in cases like (2) has Hiraiwa's (2001) [+multiple] property, causing it to undergo a Multiple Agree/Move operation with all elements that have it, simultaneously attracting all of them. As Hiraiwa (2001) points out:

> MULTIPLE AGREE (multiple feature checking) with a single probe is a single simultaneous syntactic operation; AGREE applies to all the matched goals at the same derivational point *derivationally simultaneously*. MULTIPLE MOVE (movement of multiple goals into multiple specifiers of the same probe H) is also a single simultaneous syntactic operation that applies to all the AGREEd goals. (p. 69)

Furthermore, "movement of multiple goals is a single simultaneous operation that merges multiple goals without any counter-cyclic merger and therefore a c-command relation between the goals cannot be changed" (Hiraiwa 2001, p. 70). Going back to tucking-in multiple LBE in SC, once the head with this feature is introduced into the structure, it will simultaneously attract both LB elements out of NP, and once they

undergo movement, the c-command relation between them cannot be changed. In addition, since in the derivation of cases like (2), there is no chance for *staru* to ever move over *onu*, the rescue-by-PF deletion mechanism is not relevant for the derivation of such examples. Thus, the mechanism helps with splitting multiple LBE, but is not necessary with tucking-in multiple LBE.

One piece of evidence for the proposal that the feature which drives tucking-in multiple LBE in SC has the [+multiple] property comes from the contrasts in (21) and (22), which involve examples that contain more than two AdjPs.

(21) a. On je pozvao [$_{NP}$ tog dobrog mašinskog inžinjera]
he is called that good mechanical engineer
'He called that good mechanical engineer.'
b. *On je pozvao [$_{NP}$ tog mašinskog dobrog inžinjera]
he is called that mechanical good engineer

(22) a. Tog$_i$ dobrog$_j$ mašinskog$_k$ je on pozvao [$_{NP}$ t$_i$ t$_j$ t$_k$ inžinjera]
that good mechanical is he called engineer
'He called that good mechanical engineer.'
b. *Tog$_i$ mašinskog$_k$ dobrog$_j$ je on pozvao [$_{NP}$ t$_i$ t$_j$ t$_k$ inžinjera]
that mechanical good is he called engineer

The contrast in (21) shows that when AdjP *tog* 'that', *dobrog* 'good', and *mašinskog* 'mechanical' occur within an NP, their order is fixed, it has to be *tog dobrog mašinskog,* and it cannot be *tog mašinskog dobrog,* for example. The contrast in (22) shows that the baseline order has to be preserved under tucking-in multiple LBE as well. The reason why it is preserved straightforwardly falls out of the assumption that the feature attracting AdjPs is a [+multiple] feature. Note that, in principle, the original order of tucked-in phrases does not have to be preserved under movement, as it is in these examples in SC. For example, multiple *wh*-fronting in Bulgarian involves tucking-in *wh*-phrases in multiple Specs,CP. However, the baseline order of *wh*-phrases does not have to be preserved under tucking-in. As Bošković (2002, 2015b), among others, shows, while in Bulgarian, the highest *wh*-phrase has to move to Spec,CP first, the order of movement of other *wh*-phrases is, in principle, free, as shown in (23) and (24).

(23) a. Kogo kak e tselunal Ivan?
whom how is kissed Ivan
'How did Ivan kiss whom?'
b. ?*Kak kogo e tselunal Ivan?

(24) a. Koj kogo kak e tselunal?
who whom how is kissed
'Who kissed whom how?'
b. Koj kak kogo e tselunal?
c. *Kogo koj kak e tselunal?

Under the tucking-in analysis of these facts (Richards 2001, among others), the highest *wh*-phrase moves to Spec,CP first, and the other two *wh*-phrases tuck-in below it. The order of tucking-in of *wh*-phrases other than the first one does not matter.[3] This state of affairs is clearly different from that in SC examples above, and, thus, Bulgarian multiple *wh*-fronting is not driven by a [+multiple] feature.[4]

To sum up, the tucking-in and splitting multiple LBE differ in that multiple LBE elements move to multiple Specs of the same projection in the tucking-in option, while under the splitting option, they move to different projections. Furthermore, the feature that drives tucking-in has a [+multiple] property, which requires the LBE elements to undergo

[3] For an explanation of the Bulgarian facts, see Bošković (2015b, among others). In a nutshell, Bošković argues that the highest *wh*-phrase in Bulgarian must move first to check the +wh-feature on C in the most economical way, satisfying Superiority. The other two phrases move to check a +focus feature. Since, according to Bošković, in contrast to *wh*-movement, focus-movement is not subject to Superiority, if there are three *wh*-phrases in Bulgarian questions, the order of the second and the third *wh*-phrase is expected to be free. Bošković captures the freedom of focus movement from Superiority by assuming that the focus feature has an Attract-all property. The Attract-all property allows the focus requirement to be checked in the same way in terms of nodes crossed regardless of the order of movement of the *wh*-phrases.

[4] Interestingly, SC also has the same Attract-all +focus feature that drives multiple *wh*-fronting (Bošković 2015b, among others). Even though it has been proposed in the literature that the driving force behind LBE in SC is focus, it clearly cannot be the same type of feature as in multiple *wh*-fronting, given that the feature in multiple LBE has a [+multiple] property.

Hiraiwa's (2001) Multiple Agree/Move. This allows for the baseline order of the tucked-in LB elements to be preserved, and explains why the PF copy deletion repair mechanism does not affect the tucking-in option. In the next section, I show that the analysis proposed here can be extended to cases of splitting multiple LBE like (1b).[5]

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[5] Interestingly, there are some semantic differences between the tucking-in and splitting option, which may shed light on why both options exist. First, note that the following baseline sentence is ambiguous due to the ambiguity of the adjective *starijeg* 'older':

(i) On je doveo svog starijeg brata.
he is brought his older brother
'He brought his older brother.'

Starijeg 'older' has both a restrictive and non-restrictive interpretation here. Under the restrictive interpretation, the subject *on* 'he' has only one brother, who is older than him, and he brought the brother with him. Under the non-restrictive reading, *on* 'he' also has (a) younger brother(s), but he brought his older one. Now consider the following sentence with tucking-in multiple LBE derived from the baseline sentence in (i):

(ii) *Svog starijeg* je on doveo brata.
his older is he brought brother
'He brought his older brother.'

This sentence is not ambiguous. The only reading that *starijeg* has is a restrictive one (regardless of whether both or one of the tucked-in elements receive contrastive stress). Thus, the sentence means that he brought his older brother, but not the younger one(s). On the other hand, consider (iii) with splitting multiple LBE:

(iii) *Svog* je on *starijeg* doveo brata.
his is he older brought brother

If both LBE-ed elements receive contrastive stress, the sentence is not ambiguous. The adjective *starijeg* only has a non-restrictive reading (he has one brother, and *starijeg* tells us something additional about his brother). If *svog* receives contrastive stress, but *starijeg* is backgrounded, as for example, in the context where A says: 'He brought her older brother', and then B says: 'No, he brought <u>his</u> older brother, not hers', the sentence is ambiguous. In other words, *starijeg* can be interpreted both restrictively and non-restrictively. On the other hand, if only *starijeg* receives contrastive stress, then the sentence is unambiguous, with the restrictive reading of *starijeg* as the only possibility. Similar facts obtain with a demonstrative adjective as one of the adjectives:

4 Extension to AdvP LB Elements

The analysis proposed in the previous sections predicts that cases like (1b) should be grammatical, and they are. Such examples involve LBE of an AdjP modifying a noun and an AdvP, a left branch of another AdjP modifying the same noun, as shown schematically in (25).

(25) $[AdjP1_i$ ....$AdvP_k$ .....$[_{NP}$ t_i $[_{NP}$ $[_{AdjP2}$ t_k $[_{AdjP2}$ Adj]] N]]]

Consider how the analysis proposed in the previous sections can account for these examples as well. First, Talić (2015) shows that the extraction of AdvP out of AdjP headed by short adjectival forms in SC is possible. In (26), AdvP *strašno* 'frightfully' that modifies Adj *težak* 'difficult' is extracted, and the sentence is grammatical.

(26) *Strašno*$_i$ je to bio $[_{NP}$ $[_{AdjP}$ t_i $[_{AdjP}$težak]] $[_{NP}$ zadatak]]
frightfully is that been difficult task
'That was a frightfully difficult task.'

This means that the leftmost adjunct/Spec (AdvP) embedded in the topmost edge (AdjP) of the NP phase also counts as the edge of the NP phase for the purposes of PIC.

(iv) a. *Ovu novu* je on kupio kuću. (tucking-in multiple LBE)
this new is he bought house
'He bought this new house.'

b. *Ovu* je on *novu* kupio kuću. (splitting multiple LBE)
This is he new bought house

(iva) means that he bought this new house, rather than that new or old one. In other words, the adjective *novu* 'new' is restrictive. (ivb) means that he bought this house, which is new. *Novu* 'new' just tells us something additional about the house that he bought, and is non-restrictive. So, it appears that semantics as well as information packaging in the sentence affect the choice of splitting vs. tucking-in. I leave the explanation of these facts for future research, but given that the meaning of the expression depends on the choice of multiple LBE option, they may provide further evidence against the scattered PF copy deletion analysis of multiple LBE (see Bošković 2015a).

Now, going back to the example in (1b), note that after AdjP *jedan* and AdvP *strašno* undergo multiple LBE, *jedan* is higher in the structure than *strašno*. Note also that when they are in-situ, AdjP *jedan* cannot follow AdjP *strašno težak* 'very difficult', as shown in (27).

(27) a. *To je bio strašno težak jedan zadatak.
that is been frightfully difficult one task
b. To je bio jedan strašno težak zadatak.
that is been one frightfully difficult task
'That was a frightfully difficult task.'

It follows, then, that in (1b), *strašno* (the outmost adjunct of the AdjP *težak*) moves first over *jedan*, the NP phase edge, in violation of PIC. At that point, a * is placed on the outmost edge.

(28) [strašno$_k$ .....[$_{NP}$ [$_{AdjP1}$ jedan$_i$]* [$_{NP}$ [$_{AdjP2}$ t$_k$ [$_{AdjP2}$ težak]] zadatak]]]
frightfully one difficult task

AdjP *jedan* then undergoes movement to a projection higher than *strašno*, leaving a copy in its original position, with a * on it.

(29) [jedan$_i$....[strašno$_k$...[$_{NP}$ t$_i$* [$_{NP}$ [$_{AdjP2}$ t$_k$ [$_{AdjP2}$ težak]] zadatak]]]]
one frightfully difficult task

At PF, this starred copy is deleted, and the PIC violation is rescued.

While (1b) shows that splitting multiple LBE is possible in this type of examples, how about tucking-in? Interestingly, some speakers find it more difficult than in examples where two AdjPs are tucked in. They find a contrast between tucking-in cases like (30a) and split cases like (1b) on one hand, and between (30a) and (30b), which contains two AdjPs that look very similar to the AdjP and AdvP in (30a), on the other. Other speakers do not find (30a) as degraded.

(30) a. (??)*Jedan$_i$* *strašno$_k$* je to bio [t$_i$ [t$_k$ težak] zadatak]
one frightfully is that been difficult task
'That was one frightfully difficult task.'

b. *Jedan*$_i$ *strašan*$_k$ je to bio [$_{NP}$ t_i t_k zadatak]
one frightful is that been task
'That was one frightful task.'

It is not the case that speakers with this contrast cannot tuck in their left branch AdvPs. Thus, they accept (31), where two AdvPs modifying the same Adj are tucked in multiple Specs of the same head.

(31) *Dvaput*$_i$ *teško*$_k$ je to bio [$_{NP}$ [$_{AdjP}$ t_i [$_{AdjP}$ t_k poražen]] tim]
twice horribly is that been defeated team
'That was a twice horribly defeated team.'

These data lead to a conclusion that these speakers have a restriction on tucking in LB elements. The tucked-in LB elements must all modify the same head.

As for the speakers who do accept patterns like (30a), the higher AdjP has to precede the AdvP modifier of the lower AdjP, after the two LB elements undergo tucking-in. Thus, examples like (32), are ungrammatical.

(32) **Strašno*$_k$ *jedan*$_i$ je to bio [t_i [t_k težak] zadatak]
frightfully one is that been difficult task
'That was one frightfully difficult task.'

This fact falls out of Hiraiwa's Multiple Agree/Move, just as in the case of two AdjPs tucked-in in multiple Specs of the same head. However, this order of LBE-ed AdjP and AdvP is possible under splitting, as shown in (33).

(33) *Strašno*$_k$ je to *jedan*$_i$ bio [t_i [t_k težak] zadatak]
frightfully is that one been difficult task
'That was one frightfully difficult task.'

The sentence is felicitous, for example, in the context where *strašno* is emphasized. Its derivation proceeds in much the same way as the derivation of examples like (20), where a PIC violation caused by *strašno* moving over the in-situ copy of *jedan* at the NP phase edge is rescued by the deletion of this starred copy at PF. Thus, examples where

multiple LBE affects a higher AdjP out of an NP and an AdvP modifier of a lower AdjP of the same head exhibit the same patterns for most speakers, and can be derived in the same way, as multiple LBE that affects AdjPs of the same noun. There are speakers, though, who have a restriction on tucking in LB elements that are not modifiers of the same head.

5 Implications for the Approaches to LBE

The data discussed in this paper cast doubt on the scattered deletion approach (Ćavar & Fanselow 2000), as well as the remnant movement approach (Franks and Progovac 1994) to LBE. The scattered deletion approach derives LBE by fronting the whole NP and then performing scattered deletion of copies of the moved NP at PF. However, it is difficult to see how this approach would derive the ordering constraint with tucking-in and the lack of it with splitting, observed in examples like (1a) and (20) on one hand, and (2) and (7) on the other. It predicts that both tucking-in and splitting should behave in the same way in this respect.

The remnant movement approach faces similar difficulties. In this approach, assuming with Abney (1987) that NPs are complements of Adjs, LBE involves the movement of a remnant AP out of which the NP complement of A has been extracted first, as in (34).

(34) $[_{AP}$ težak $t_i]_j$ je to bio $[_{NP}$ zadatak$]_i$ t_j
difficult is that been task
'That was a difficult task.'

It is difficult to see how this approach would yield cases like (1b), for example. At best, it would have to assume a series of remnant movements of NP, AdjP2, AdvP out of AdjP2 remnant and finally AdjP1 over it, in order to be able to extract constituents. However, it is not clear why all of these movements (in many cases vacuous) would be happening. The same goes for examples like (35), where the outmost Spec of the edge (AdvP) of the edge (AdjP) of the NP phase is extracted.

(35) *Izuzetno*$_i$ je to bio $[_{NP}$ $[_{AdjP}$ $[_{AdvP}$ t_i lijepo] namješten] stan]
extremely is that been nicely furnished apartment
'That was an extremely nicely furnished apartment.'

This example also shows that no matter how deeply embedded, the leftmost adjunct/Spec counts as the edge of a phase for PIC. Furthermore, the grammaticality of the example in (36) shows that in case its movement violates PIC, its violation can be rescued in the same way as for (1b).

(36) *Jedan*$_k$ je to *izuzetno*$_i$ bio [$_{NP}$ [$_{AdjP}$ t$_k$] [$_{AdjP}$ [$_{AdvP}$ t$_i$ lijepo] one is that extremely been nicely namješten] stan] furnished apartment
'That was one extremely nicely furnished apartment.'

6 Conclusions

In this paper, I have shown that splitting multiple LBE is possible in SC. In this type of multiple LBE, LB elements move to distinct projections, unlike in the tucking-in option, where LB elements undergo movement to the same projection to check a [+ multiple] feature. Furthermore, the existence of splitting LBE provides evidence for Bošković's (2014, 2016) proposal that phasal edges are contextually determined. Movement of Specs/adjuncts at the edge of a phase can affect the edge status of other Specs/adjuncts. It also shows that PIC violations accrued in overt syntax can be rescued by copy deletion at PF. The data presented in this paper also provide evidence that multiple LBE involves sub-extraction of LB elements from NPs, rather than scattered deletion or remnant movement.

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Dative-Infinitive Constructions in Russian: Are They Really Biclausal?*

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1 Introduction

This paper investigates the syntax of the dative-infinitive construction (DIC) in Russian, illustrated in (1) (datives are in bold).[1] For space reasons, I will limit my discussion to matrix clauses, (1a-b), but the proposed analysis can be extended to the so-called "second datives", (1c).

(1) a. Čto **nam** bylo delat' v etoj situacii?
what us.DAT was to.do in this situation
'What were we supposed to do in this situation?'
b. **Gruzovikam** budet zdes' ne proexat'.
trucks.DAT will.be here NEG to.go.through

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[1] Giving an accurate translation of a DIC in English is not a straightforward task, and usually there is more than one way to gloss its meaning. For sentences like (1b), Moore & Perlmutter (2000) and Fleisher (2006) use the formula: 'it is not in the cards for X to...'. Another possible translation is 'X is not able to...'. In general, sentences like (1b) carry a modal flavour of a *negated possibility* ('it is impossible for X to...'), which is often related to a lack of internal ability under certain (usually uncontrollable) circumstances. As we shall see, the modal flavour changes depending on the operators present in the clause (imperfective, negation, question, etc.).

'It will be impossible for trucks to get through here.'

c. On znaet [kak postroit' dom **samomu**].
he.NOM knows how to.build house self.DAT
'He knows how to build a house by himself.'

What motivates the current study is a largely unsettled question about the structural complexity of DICs in Russian, boiling down to the choice between a biclausal structure (Schein 1982; Sigurðsson 2002; Fleisher 2006; Jung 2009, 2011: ch. 3) and a monoclausal one (Kondrashova 1994; Komar 1999; Moore & Perlmutter 2000; Bailyn 2004, 2012:170). The question of whether or not DICs are biclausal may seem trivial, but it is important for our understanding of infinitival structures and their relation to the dative case and modality.

In this paper, I defend a monoclausal view of DICs, claiming that the dative is introduced by an applicative above TP. This claim is inspired by Rivero's (2009) analysis of involuntary state constructions in Slavic. As will be seen in Section 3, a subclass of DICs (declarative DICs without negation) and the involuntary state share the same aspectual property (imperfective operator) and, more generally, DICs instantiate "covert modality" (Bhatt 2006). That is, modality in DICs is not attributable to a single lexical item, but results from a non-trivial interaction between categories and features within a monoclausal structure. I argue that the high applicative (and its dative case feature) is one of such categories. Before unfolding my proposal, I shall start with a discussion of a biclausal approach to DICs in Section 2.

2 Against a Biclausal Analysis of DICs

One of the assumptions of a biclausal account, e.g. Fleisher 2006 (see below), is that the verb *byt'* in (1a-b) is an existential predicate (not the copula *byt'*) that is also found in modal existential (2a) and modal possessive (2b) constructions (see Livitz 2012 for the latter and Babby 2000 and Kondrashova & Šimík 2013 for the former).

(2) a. **Mne** budet čto skazat'.
me.DAT will.be what to.say
'I will have something to say.'

b. **U menja** est' kogo priglasit' na svad'bu.
at me.GEN there.is whom to.invite on wedding
'I have somebody to invite to the wedding.'

Alternatively, Moore & Perlmutter (1999) have proposed that the impersonal form of *byt'* in DIC is a temporal particle functioning as an adverbial modifier. As a matter of fact, *byt'* in (1a-b) does not have the same distributional properties as *byt'* in (2) and, crucially, it does not behave like a matrix verb in many respects. Let us first have a quick look at two biclausal analyses of Russian DICs: one of them explores the idea of control (Fleisher 2006) and the other relies on the idea of exceptional case marking and raising (Jung 2009, 2011: ch. 3).

Fleisher (2006) assumes that the verb *byt'* (BE) is a ditransitive predicate taking the dative NP and the infinitival CP as its internal arguments (4). This verb is lexicalized in the past and the future, being null in the present (3). The external argument position in the matrix clause is taken by a null expletive, which stays inside VP, while the dative NP raises to Spec,IP to satisfy the Extended Projection Principle.

(3) Ivanu ∅ / bylo / budet ne postupit' v universitet.
Ivan.DAT is / was / will.be NEG to.enter into university
'It is / was / will be impossible for Ivan to enter university.'

(4) $[_{IP}$ NP-DAT$_i$ $[_{VP}$ *expl* $[_{V'}$ BE t_i $[_{CP}$ PRO$_i$ *infinitive*]]]]

For Fleisher, the verb *byt'* is essentially the same in (2) and (3) (i.e. existential *byt'*) with the only difference that *byt'* in DICs also has a modal (obligation) meaning, while in (2) it retains its "basic meaning" (Fleisher 2006:30). The immediate question is: Why is the present form *est'* available in (2), but not in (3)? Fleisher explains that *est'* is an emphatic form related to the *wh*-movement in (2) (what is asserted is the existence of a token, not the existence of a situation, as in DICs).

From a slightly different perspective, Jung (2009, 2011: ch. 3) suggests that the dative NP raises from the embedded clause. She assumes that BE is a deontic modal taking an infinitival CP as its complement. The dative case is assigned under exceptional case marking by a null preposition (P_{DAT}) heading the embedded CP (5).

(5) $[_{IP}$ NP-DAT$_i$ $[_{VP}$ BE $[_{CP}$ P_{DAT} $[_{TP}$ t_i *infinitive*]]]]

As we can see, it is not a canonical raising configuration, since the NP movement is not triggered by case (the latter is assigned in situ). If a purely raising analysis is to be pursued, one has to assume that an NP can move to a dative case position. The case would be assigned by BE and we need to assume that BE assigns structural dative case. Otherwise, we have to admit that an NP can move into an inherent case position, which is possible, but the difference between raising and control becomes pointless. A raising analysis inevitably faces several questions, but prior to engaging in any debate about raising vs. control, it is important to ask: Is there any empirical support for a biclausal structure to start with?

Fleisher's (2006) arguments in favour of a biclausal view of DICs have not been challenged, and his manuscript is usually cited as a key reference in the "biclausal camp" (see, e.g., Landau 2008:883, fn. 6; Jung 2008:66; Bailyn 2012:171). He presents three arguments: (i) the position of the sentential negation, (ii) aspectual restrictions on the infinitive and (iii) the impossibility to control a DIC. I discuss Fleisher's arguments in Sections 2.1-2.3.[2] In Section 2.4, I add an argument against a biclausal structure (either control or raising), showing that BE cannot move to C.

2.1 Sentential Negation

Fleisher observes that the sentential negation marker *ne* has to follow the verb *byt'* in DICs (6), while it has to precede *byt'* in the periphrastic future (7), which arguably involves a monoclausal structure.

(6) a. Ivanu bylo **ne** postupit' v universitet.
Ivan.DAT was NEG enter.PERF.INF into university
'It was impossible for Ivan to enter university.'
b. *Ivanu **ne** bylo postupit' v universitet.

[2] I will not discuss non-subjecthood of the dative (vs. nominative). Datives cannot be full-fledged subjects as they would never trigger agreement (irrespectively of their structural position), and they imply lack of control over a situation (see Section 3.1). They just cannot be compared with nominatives for independent reasons.

(7) a. Ivan **ne** budet postupat' v universitet.
Ivan.NOM NEG will.be enter.IMP.INF into university
'Ivan will not be entering university.'
b. *Ivan budet **ne** postupat' v universitet.

However, if *byt'* in (6) were a matrix verb, why would *ne* be restricted to the embedded clause? Either a control (8a) or a raising verb (8b) can be preceded by *ne*.

(8) a. Ivanu **ne** stoilo postupat' v universitet.
Ivan.DAT NEG was.worth enter.IMP.INF into university
'It was not worth it for Ivan to enter university.'
b. Ivan **ne** sčitaetsja xorošim studentom.
Ivan.NOM NEG is.considered good student
'Ivan is not considered to be a good student.'

According to Fleisher (2006:29), the modal *byt'* has to take a wide scope in DICs with negation. He calls it "strong reading" (obligation > negation), and in his wording the reading of (6a) should be: 'it must be the case that it is for Ivan not to enter university'. This is problematic for the following reasons. First, if a temporal operator is possible in the matrix clause in (6a), it is not clear why Neg(ation) cannot be merged in the matrix clause as well to interact with T(ense), deriving something like 'it must not be the case (in the past) that it is for Ivan to enter university'. Second, what is asserted by (6a) is that Ivan is not able to pass the exam. Under Fleisher's "strong reading", it is predicted that the modal should also take scope over the dative in (9): 'it must be the case that it is for every applicant not to pass the exam'. This reading excludes the possibility of entering university for some applicants; this possibility is entailed by (9).

(9) Každomu abiturientu bylo **ne** postupit' v universitet.
[every applicant].DAT was NEG enter.PERF.INF into university
'It was impossible for every applicant to enter university.'

In sum, the contrast between (6) and (7) is not an argument for a biclausal structure in DICs. On the contrary, the fact that *ne* has to follow *bylo* in (6a) should reflect the clausal architecture in Russian.

2.2 Aspectual Restrictions

In declarative DICs with negation, the verb *byt'* has to co-occur with a perfective infinitive (10a), while in the periphrastic future it has to co-occur with an imperfective one (10b).

(10) a. Ivanu bylo ne postup-i/*a-t' v universitet.
Ivan.DAT was NEG enter-PERF/IMP-INF into university
'It was impossible for Ivan to enter university.'
b. Ivan budet postup-*i/a-t' v universitet
Ivan.NOM will.be enter-PERF/IMP-INF into university
'Ivan will be entering university.'

Fleisher takes this contrast with the periphrastic future as an argument for a biclausal structure. However, he does not mention the fact that the imperfective infinitive is the only available option in declarative DICs without negation (11a). Note that turning (11a) into a question (11b) allows both perfective and imperfective infinitives.[3] Fleisher's analysis has nothing to say about this peculiarity, to which I return in Section 2.2.

(11) a. Ivanu postup-*i/a-t' v universitet.
Ivan.DAT enter-PERF/IMP-INF into university
'Ivan has to enter university.'
b. Ivanu postup-i/a-t' v universitet?
Ivan.DAT enter-PERF/IMP-INF into university
'Should Ivan enter / be entering university?'

Moreover, the fact that *bylo* in (10a) is incompatible with the imperfect tells nothing about the structure itself. A control verb like *stoit'* 'be

[3] A reviewer wonders if the negated variant of (11b) is possible with both perfective and imperfective verbs. Interestingly, adding Neg to a perfective form would change the modal flavour from the deontic one, as in (11b), back to the negated possibility. This type of question implies a conversational background in which circumstances suddenly make realization of an event impossible: *(I čto že teper'?) Ivanu* ***ne*** *postupit' v universitet?* '(And what now?) Ivan cannot enter university?' The intonational contour also changes: if the pitch raises on the verb in (11b) (and its negated variant with an imperfective verb), it raises on the final word in its negated variant with a perfective verb.

worth' shows just the opposite pattern: it is only compatible with an imperfective infinitive (just like *byt'* in the periphrastic future), and it is incompatible with a perfective infinitive (12) (cf. (10a)).

(12) Ivanu ne stoilo postup-*i/a-t' v universitet.
Ivan.DAT NEG was.worth enter-PERF/IMP-INF into university
'It was not worth it for Ivan to enter university.'

2.3 Control of DICs

Finally, Fleisher (2006:10) takes the contrast in (13) (his (15)) to be another piece of evidence in favour of his structure in (4). He interprets the impossibility of control in (13b) as an indication that there is no subject to control; recall that PRO is the object of the verb *byt'* in his analysis.

(13) a. Ja_i ne xoču [PRO_i rabotat' segodnja].
I.NOM NEG want to.work today
'I do not want to work today.'
b. *Ja_i ne xoču [PRO_i byt' rabotat' segodnja].
I.NOM NEG want to.be to.work today
Intended: 'I do not want to have to work today.'

However, the string **byt' rabotat'* is ungrammatical by itself: the verb *byt'* cannot be used with an infinitive unless it has a tensed form (*bylo* or *budet*). Thus, the ungrammaticality of (13b) is not necessarily attributable to control.

It appears that every argument that Fleisher (2006) presents in favour of a biclausal structure is seriously flawed. I will not discuss his arguments in favour of control (as opposed to raising), since what is at stake is a biclausal approach in general, not its specific kind. Section 1.4 argues that the verb *byt'* in DICs is not a matrix verb.

2.4 Verb Movement in Yes-No Questions

Both control and movement analyses predict that the matrix *byt'* should be able to undergo a head movement in a yes-no question, contrary to

fact; see (14b), derived from (14a).[4]

(14) a. Ivanu bylo ne postupit' v universitet.
Ivan.DAT was NEG enter.PERF.INF into university
'It was impossible for Ivan to enter university.'
b. *Bylo li Ivanu ne postupit' v universitet?
was Q Ivan.DAT NEG enter.PERF.INF into university
Intended: 'Was it impossible for Ivan to enter university?'

Either control (15) or raising (16) predicates can undergo movement in yes-no questions.

(15) a. Nam stoilo ob etom govorit'.
us.DAT was.worth about it to.talk
[Lit.: 'It was worth for us to talk about it.']
b. Stoilo li nam ob etom govorit'?
was.worth Q us.DAT about it to.talk
[Lit.: 'Was it worth for us to talk about it?']

(16) a. Ivan sčitaetsja xorošim studentom.
Ivan.NOM is.considered good student
'Ivan is considered to be a good student.'
b. Sčitaetsja li Ivan xorošim studentom?
is.considred Q Ivan.NOM good student
'Is Ivan considered to be a good student?'

In modal existential constructions, the verb *byt'* can also be head-moved:

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[4] As far as I can see, there is no way to express the intended meaning in (14b), using a DIC. If the question is about Ivan's ability, a periphrastic expression can be used, as in (i).

(i) Byl li Ivannesposoben postupit' v universitet?
was.M Q Ivan unable.M to.enter into university
'Was Ivan unable to enter university?'

I assume that the particle *li* is located in C, and it "attracts" the highest available verbal category (main V, copula or auxiliary) in yes-no questions. Why can *byt'* not move to C in DICs is the question that I answer in Section 3.2.

(17) a. Ivanu bylo s kem pogovorit'.
Ivan.DAT was with whom to.speak
'Ivan has somebody to speak with.'
b. Bylo li Ivanu s kem pogovorit'?
was Q Ivan.DAT with whom to.speak
'Did Ivan have somebody to speak with?'

The contrast between (14) and (15)-(16) clearly shows that the verb *byt'* in DICs does not behave like a matrix verb, and it is different from *byt'* in existential constructions like (17), contra Fleisher 2006.

All in all, there is no compelling evidence that DICs should have a biclausal structure with a control or raising verb in the matrix clause. There are good reasons to pursue a monoclausal analysis.

3 Towards a Monoclausal Analysis of DICs

3.1 Datives Applied to Infinitives

Compared to other Slavic languages, Russian might be somewhat special in being a BE-language (Isačenko 1974, Freeze 1992), but it can still share some general property with other Slavic languages. I claim that the relevant property is a high applicative selecting a TP. Rivero (2009) postulates such an applicative for involuntary state ('feel-like') constructions (ISCs), as in (18a) and (18b) from Bulgarian and Slovenian, respectively (examples from Rivero 2009:152).[5]

(18) a. Na decata im se raboteše.
P children.the 3PL.DAT REFL work.IMP.3SG
'The children {were in a working mood / felt like working}.'
b. Janezu se je pilo vodo.
J.DAT REFL be.3SG drunk.NEU water.F.ACC
'John {felt like drinking / was thirsty for} water.'

[5] Russian has similar constructions, as in (i) (see Benedicto 1995). Rivero (2009:154, fn. 2) points out that they are not identical to ISCs, but these differences are irrelevant here.

(i) Mne čto-to ne rabotaet-sja.
me.DAT some NEG work.IMP.3SG-REFL
'I cannot work for some reason.'

Crucially, Rivero (2009) analyzes ISCs as being monoclausal (contra Marušič & Žaucer 2006). She proposes a structure where the dative NP is structurally parallel to a Topic, and it is introduced by an Appl(icative) above TP:

(19) $[_{\text{ApplP}}$ NP-DAT $[_{\text{Appl}}$ Appl $[_{\text{TP}}$ T $[_{\text{AspP}}$ IMP$^{\text{OP}}$ $[_{\text{vP}}$ v VP]]]]]

Comparing Slavic ISCs with English Progressive Futurates and Spanish modal *Imperfectos*, Rivero argues that the imperfective operator (IMP$^{\text{OP}}$) in the Asp(ectual) projection below TP is a source of intensionality. English and Spanish counterparts denote plans, and they can have more than one adverbial merged below or above AspP, creating an impression of a biclausal structure (e.g., *Yesterday morning I was leaving tomorrow on the Midnight Special*, Rivero 2009:157, citing an example from Dowty 1979). What is different in ISCs is that IMP$^{\text{OP}}$ is contained in the applicative structure introducing the dative case feature. The latter implies lack of control over a situation, and ISCs denote dispositions rather than plans (see also Rivero & Arregui 2012 for further discussion).

The dative case and imperfective viewpoint aspect constitute a striking similarity between ISCs and declarative DICs without negation. As shown in (24), these DICs must be imperfective. The utterance in (20a) has a circumstantial modal flavour, and both the dative and IMP$^{\text{OP}}$ (expressed by the suffix *-va-*) contribute to the intensional meaning.

(20) a. **Mne** zavtra rano vsta-**va**-t'.
me.DAT tomorrow early get.up-IMP-INF
'I have to get up early tomorrow.'

b. ***Mne** zavtra rano vstat'.
me.DAT tomorrow early get.up.PERF.INF

By analogy with (19), I propose the following structure for (20a):[6]

(21) $[_{\text{ApplP}}$ NP-DAT$_{\text{i}}$ $[_{\text{Appl}}$ Appl $[_{\text{TP}}$ T $[_{\text{AspP}}$ IMP$^{\text{OP}}$ $[_{\text{vP}}$ t_{i} $[_{\text{v}}$ v VP]]]]]]

One noticeable difference between (19) and (21) is that the subject NP in

[6] At this point, I use (21) to establish a parallel between ISCs and DICs; this structure will be refined later in this section.

(21) raises to the dative case position (Spec,ApplP) from its inner θ-position (Spec,vP). That is, it is a raising structure, but within a single clausal domain. Note that Appl merged above TP does not introduce a new θ-relation.[7] It establishes a modal relationship between a proposition and an individual, but this relationship does not prevent the same individual to be a participant of the event denoted by the proposition (i.e., to have a θ-role within vP). In other words, the dative case (DAT) assigned by Appl in (21) is a modal feature that has to be licensed by a modal category.

Intuitively, it seems plausible to consider IMP^{OP} as a modal operator that licenses DAT in (20a). The perfective viewpoint aspect, on the other hand, cannot license DAT, as shown in (20b), and Neg would be the licenser of DAT in (22) (forming a minimal pair with (20b)).

(22) **Mne** zavtra rano **ne** vstat'.
me.DAT tomorrow early NEG get.up.PERF.INF
'It is impossible for me to get up early tomorrow.'

However, the following question arises: How is it possible that in declarative DICs, as in (20a) and (22), a modal operator that is below TP licenses DAT that is above TP (assuming that NegP is sandwiched between TP and AspP)? Even if IMP^{OP} and Neg appear to be crucial elements in (20a)/(22), it is still plausible to assume that the licensing category is structurally higher than ApplP, and the infinitival C (C_{INF}) seems to be a perfect candidate among possible licensers of DAT. In fact, this assumption is in line with earlier proposals that DICs are full-fledged CPs (Kondrashova 2009) and that the dative of infinitives is related to a

[7] A new θ-relation (benefactive, locative, etc.) can be added above VP, but below vP (VoiceP in Pylkkänen 2008). Note that internal Merge into Spec,ApplP is not necessarily incompatible with Pylkkänen's original idea that Appl selects/introduces an ⟨e⟩-type argument. If Merge (external or internal) is the basic syntactic operation, we could equally apply internal Merge to saturate Appl, provided that there is no conflict between θ-relations (as discussed here). In the literature, there are in fact proposals taking Spec,ApplP as a derived position. Thus, Grashchenkov & Markman (2008) propose that inalienable possessors raised out of nominal predicates move to Spec of a high Appl head (above a small clause).

modal C (Bailyn 2004, 2012:170). At the same time, it is worth emphasizing that under the current proposal C_{INF} does not assign DAT; C_{INF} is a licenser of DAT in conjunction with other features and operators composing the modal meaning. At a descriptive level, Russian DICs seem to be reducible to a set of statements in (23).

(23) a. DAT is a modal feature introduced by Appl above TP.
b. DAT has to be under the scope of a modal operator.
c. C_{INF} is a modal operator if and only if:
(i) C_{INF} takes the scope over IMP^{OP} or Neg, or
(ii) C_{INF} has a wh/question/mood (WH/Q/M) feature.

The condition in (23c) intends to capture the essence of covert modality, which (as defined in Bhatt 2006) is not associated with a lexical item (e.g., a modal verb). That is, modal interpretation of C_{INF} is dependent on other categories and features.

As an alternative to the condition in (23c), we can assume that C_{INF} is always modal, but C_{INF} alone is not sufficient to compose the modal meaning—it needs "support" from other categories and features. In this case, the underlying assumption is that the syntactic structure and the meaning are isomorphic, and we can associate C_{INF}, DAT, IMP^{OP}, Neg and a [WH]/[Q]/[M] feature with such components of modal meaning as modal force, modal base and ordering source (Kratzer 1981, 1991). From this perspective, the role of C_{INF} is to link the proposition to a conversational background that provides accessible worlds (modal base) and their ranking (ordering source). DAT also contributes to the modal base and the ordering source of the construction by restricting accessible worlds to those that are compatible with the abilities, dispositions and obligations of the individual denoted by the dative NP. Thus, the impossibility of getting up early in (22) may be related to some external circumstances (e.g., a late party), but these circumstances would affect different people differently (the speaker may not be able to get up early if she or he goes to bed after midnight, but this is not necessarily a problem for somebody else). In other words, the possibility that the event occurs is restricted by the speaker's ability to get up early in a given set of circumstances. As for the modal force (the third component of the modal meaning), it is provided by IMP^{OP}, Neg or a [WH]/[Q]/[M] feature in C_{INF}. These syntactic elements ensure quantification over accessible worlds

and complete the modal meaning of the construction. If none of such elements is present in the structure, the modal meaning would be incomplete and DAT, introduced by Appl above TP, would not be properly interpreted.

In light of this compositional view, we can now resume our discussion of IMP^{OP} and Neg. The discussion of WH, Q and M will follow right after.

IMP^{OP} is a universal quantifier ranging over possible worlds/ situations that are compatible with a given proposition (see Arregui et al. 2014 for a recent analysis of IMP^{OP} in terms of situational semantics). Thus, the presence of IMP^{OP} in (20a) leads to the expression of modal necessity.[8] The structure in (24) below is an extended version of (21), where C_{INF} provides the modal base and the ordering source (both restricted by NP-DAT), and IMP^{OP} (below TP) contributes to the modal force, quantifying over all accessible worlds.

(24) $[_{CP}\ C_{INF}\ [_{ApplP}$ NP-DAT $[_{Appl'}$ Appl $[_{TP}$ T $[_{AspP}\ IMP^{OP}$ ...]]]]

A perfective operator ($PERF^{OP}$), on the other hand, asserts the existence of a single event in the actual world, but it does not range over a set of possible worlds.[9] Taking the scope over the event, viewed as whole

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[8] Bjorkman & Cowper (2016) propose to unify predicative possession (e.g., *I have a car*) and modal necessity (e.g., *I have to get up early tomorrow*). For the latter, they use the term "possessive modality". They attempt to extend their analysis to other *be*-possession languages (namely Hindi-Urdu and Bengali), but they remain agnostic as to whether Russian DICs express necessity (43, fn. 18). Bare imperfective DICs, like that in (24a), do in fact express modal necessity. The current proposal is a step towards unifying predicative possession (see Section 2.1) and possessive modality in Russian.

[9] Perfective aspect is known to trigger a so-called "actuality entailment" (terminology from Bhatt 2006: ch. 5) when used with ability modals like *pouvoir* 'to be able to' in (i) from French (examples from Hacquard 2006:21). In (ia), there is a non-cancelable entailment that Jane actually lifted the table, but no such entailment exists in (ib) where the same modal is imperfective (see Hacquard 2006 for an extensive discussion of such cases).

(i) a. Janea pu soulever cette table, #mais elle ne l'a pas soulevée.
Janecould-PERF lift this table, #but she did not lift it

(perfective viewpoint), Neg negates its existence in the actual world and turns $PERF^{OP}$ into an intensional operator. Under the scope of Neg, $PERF^{OP}$ ranges over a set of possible worlds in which the event does not take place. Being an existential quantifier, $PERF^{OP}$ leads to the expression of modal possibility. More precisely, we have a modal flavour of negated possibility ('it is impossible for X to...') or inability ('X is not able to...'). The relevant structure (representing DICs like (22)) is shown below.

(25) $[_{CP}\ C_{INF}\ [_{ApplP}$ NP-DAT $[_{Appl'}$ Appl $[_{TP}\ T\ [_{NegP}$ Neg $[_{AspP}\ PERF^{OP}\ \ldots]]]]$

In declarative DICs, (24a) and (26), different parts of the modal meaning are scattered in the structure. However, all three components of the modal meaning can be concentrated in C_{INF}. For example, Bhatt (2006: ch. 4) associates the [WH] feature with a deontic operator in C_{INF} (26a). Interrogative (26b), imperative (26c), conditional (26d) and subjunctive (26e) clauses should fall under the same analysis. In fact, all these cases seem to be reducible to three features: [WH], [Q] (interrogative force) and [M] (non-indicative mood).[10] Note that (26a-d) are perfective, and there is no Neg – recall that the perfectivity in question DICs was a puzzle under Fleisher's analysis (Section 2.2).

(26) a. **Vo skol'ko mne** zavtra vstat'?
at how.much me.DAT tomorrow get.up.PERF.INF
'At what time should I get up tomorrow?'

b. **Mne** zavtra rano vstat'?
me.DAT tomorrow early get.up.PERF.INF
'Do I have to get up early tomorrow?'

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b. Janepouvait soulever cette table, mais elle ne l'a pas soulevée.
Janecould-IMP lift this table, but shed id not lift it

[10] We could possibly use just two features, [Q] and [M], but [WH] seems to be useful in the case of modal existential constructions, as in (2a), repeated below.

(i) **Mne** budet [$_{CP}$ čto skazat'].
me.DAT will.be what to.say
'I will have something to say.'

According to Livitz (2012), (i) is a raising structure: DAT is assigned within the embedded free relative. Under the current proposal, the embedded infinitival clause in (i) has a high Appl that assigns DAT under the scope of a [WH] feature.

c. **Vsem** vstat'! Sud idët.
all.DAT get.up.PERF.INF court.NOM go.3SG
'All rise! Court is in session.'

d. Po-ran'še **by** **mne** zavtra vstat'.
DEG-earlier COND me.DAT tomorrow get.up.PERF.INF
'I should get up as early as possible.' (personal desire)

e. **Čtoby** žit' **mne** v Okijane-more.
that.SUBJ live.IMP.INF me.DAT in ocean-sea
'I want to live in the Ocean-sea.'
(A. Pushkin, *The tale of the fisherman and the fish*)

In (27), there is more than one modal operator, but it is [Q] (27a) and [M] (27b) that take the scope over DAT, and it is therefore not surprising that these sentences are essentially deontic/bouletic.[11]

(27) a. **Vo skol'ko** **mne** zavtra vsta-**va**-t'?
at what.time me.DAT tomorrow get.up-IMP-INF
'At what time should I plan getting up tomorrow?'

b. **Ne** vsta-**va**-t' **emu** bol'še tak pozdno!
NEG get.up-IMP-INF him.DAT anymore so late
'He will not be allowed anymore to get up so late.'

To wrap up, we have three basic configurations of DICs in Russian ((28a/b) repeat (24)/(25)). In the remainder of this section, I show how the applicative structure of DICs can accommodate the verb *byt'*.

(28) a. *Modal necessity*
$[_{CP}\ C_{INF}\ [_{ApplP}$ NP-DAT $[_{Appl'}$ Appl $[_{TP}$ T $[_{AspP}$ IMP^{OP} ...]]]]

b. *Negated possibility*
$[_{CP}\ C_{INF}\ [_{ApplP}$ NP-DAT $[_{Appl'}$ Appl $[_{TP}$ T $[_{NegP}$ Neg + PERF^{OP} ...]]]]

c. *Deontic/bouletic modality*
$[_{CP}\ C_{INF}$ + [WH]/[Q]/[M] $[_{ApplP}$ NP-DAT $[_{Appl'}$ Appl $[_{TP}$ T ...]]]]

[11] Deontic modal flavour is not the only one possible in interrogative DICs. When there is [Q], Neg + PERF^{OP}, we still have the reading of negated possibility (see fn. 3). There should be some competition at the conceptual/intentional interface when more than one modal force is present in the structure. I leave this possibility for future research.

3.2 Applicative BE

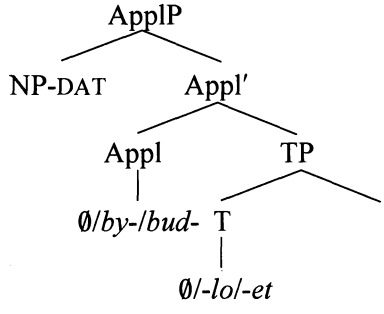
Under a monoclausal view of DICs, it seems plausible that a tensed form of *byt'* spells out T. At the same time, we should take into account the position of Neg that cannot be cliticized to *byt'* (Section 2.1) and the impossibility of T-to-C movement in yes-no questions (Section 2.4).

More precisely, I suggest that the stems of the BE-forms *bylo* and *budet* (i.e., *by-* and *bud-*, respectively) spell out Appl.[12] This idea is easily implemented if we assume late insertion. Thus, three different phonetic realizations of Appl are possible depending on spell-out of non-agreeing T, as shown in (29). Appl provides phonological support for a bound morpheme in T. If T is null, there is no need for Appl to be overt either. This is the reason why Appl is not realized as *est'* in present tense DICs (cf. discussion under (4)).

(29)

Appl ↔ ∅	T [-agr] [present]	↔	∅
Appl ↔ *by-*	T [-agr] [past]	↔	*-lo*
Appl ↔ *bud-*	T [-agr] [future]	↔	*-et*

(30)



The position of Neg and the restrictions on T-to-C movement naturally follow from (29)/(30). Thus, if there is NegP below TP, Neg cannot be cliticized to *by-/bud-*, since it would skip T (31a). Furthermore, T cannot overtly move to C since it would skip Appl (31b).[13] Note that Appl

[12] By the same token, HAVE-forms can be found in the inflectional domain in English (see Bjorkman & Cowper 2013).

[13] An anonymous reviewer asks why T cannot move to C, passing through Appl. As was assumed in fn. 4, *li* (located in C) "attracts" the highest verbal category, which would be Appl, not T. The latter is simply invisible for *li*. T cannot hop

cannot move either, since it forms a phonological word with T (provided that both have an overt realization). Finally, when Appl and T are overt, V cannot skip them while moving to C (31c), but it can pass through T and Appl when they are null (31d).

(31) a. *Ivanu ne bylo sdat' etot ekzamen.
Ivan.DAT NEG be.PAST.N take.PERF.INF this exam
'Ivan was unable to pass this exam.'

b. *Bylo$_i$ li Ivanu t_i ne sdat' etot ekzamen?
be.PAST.N Q Ivan.DAT NEG take.PERF.INF this exam
'Was Ivan not be able to pass this exam?'

c. *[Ne sdat']$_i$ li Ivanu bylo t_i etot ekzamen?
NEG take.PERF.INF Q Ivan.DAT be.PAST.N this exam

d. [Ne sdat']$_i$ li Ivanu t_i etot ekzamen?
NEG take.PERF.INF Q Ivan.DAT this exam
'Why not for Ivan to pass this exam?'

4 Conclusion

To conclude, DICs in Russian have a monoclausal structure with a high applicative selecting TP. A similar structure exists in other Slavic languages that have involuntary state ('feel-like') constructions. The difference between involuntary states and DICs is that the latter have a raising structure (the subject raises to a dative case position at the left periphery of the clause). As for the tensed form of the verb *byt'*, it spells out the Appl + T complex in the functional spine of the clause (it is not a matrix verb). My analysis also supports the idea that the modal meaning of infinitives is not attributable to a single category or feature, but stems from interaction between multiple features and categories (in our case, C_{INF}, DAT, IMP^{OP}, Neg, and C-features [WH], [Q] and [M]). Finally, my analysis implies that DAT is not an inherent property of infinitives; it is introduced by Merge on the top of TP and requires a modal licenser in the C-domain of the clause.

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on Appl in anticipation of further head movement. There is no need in this affix hopping, since T is already adjacent to Appl, and both can form a phonological word without additional operations.

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