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Approaches
to [Slavic]
Linguistics**

*The
Yale
Meeting
2008*

Michigan Slavic Publications

FASL 17, 2008

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Annual Workshop on Formal Approaches to Slavic Linguistics

*The Yale Meeting
2008*

edited by

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Preface

The seventeenth annual meeting of Formal Approaches to Slavic Linguistics was held at Yale University on May 9-11, 2008. The meeting included a Special Session on the Phonetics of Slavic Languages. Invited keynote speakers were Alexei Kochetov, Ljiljana Progovac and Draga Zec. We received 55 abstracts. 20 were accepted as paper presentations and 5 as posters. All of the presenters were invited to submit papers for this volume. The 17 papers included in this volume were carefully reviewed and revised.

We would like to acknowledge the people and institutions that provided financial support for FASL 17. Without them, the meeting would not have been possible. Funding was provided by Yale University: The Office of the Provost, the Department of Linguistics and the Department of Slavic Languages and Literatures. We are especially thankful for Stephen Anderson's assistance in arranging for the meeting's funding.

We would like to recognize our colleagues who contributed their expertise and time to the review process of both abstracts and papers. Our appreciation goes to Stephen Anderson, John Bailyn, Christina Bethin, Loren Billings, Željko Bošković, Wayles Browne, Barbara Citko, Ashwini Deo, Hana Filip, Mirjam Fried, Itamar Francez, Elena Gavruseva, Stephanie Harves, Ben Hermans, Laurence Horn, Tania Ionin, Gaja Jarosz, Nihan Ketrez, Alexei Kochetov, Jelena Krivokapić, James Lavine, Franc Marušić, Andrew Nevins, Francisco Ordonez, Barbara Partee, David Pesetsky, Maria Polinsky, Christopher Potts, Ljiljana Progovac, Gilbert Rappaport, Milan Rezac, Catherine Rudin, Tobias Scheer, Roumyana Slabakova, Sandra Stjepanović, Luka Szucsich, Sergei Tatevosov, and Draga Zec.

We would like to thank the numerous individuals who assisted in the organization of FASL 17. The conference committee included Maria Babyonyshev, Gaja Jarosz, Darya Kavitskaya, Jelena Krivokapić, and Jodi Reich. The conference coordinators were Elena Kallestinova, Jennifer Mack, Kelly Nedwick, E-Ching Ng, Michael Proctor, Michael Shvartsman, and Raquel Steres. Several graduate students at Yale

University, as well as Natalia Fitzgibbons and Nina Radkevich from the University of Connecticut, volunteered their time. We are appreciative of the Yale Slavic Chorus, who provided delightful entertainment at the meeting. They are a group of Yale students who perform folk songs from Eastern Europe and the Balkins. In addition, we would like to thank Christopher McDaniel and the faculty in the Department of Linguistics for their guidance and support throughout the organization of the FASL 17 meeting and the preparation of this volume.

Finally, we would like to convey our appreciation for Jindřich Toman, Rachelle Grubb and Michigan Slavic Publications for their assistance in producing this volume.

The Editors

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Case and Agreement Feature Uniformity under Multiple Agree

Christopher Becker
University of Michigan

The uniformity of case and agreement features across the determiner, adjectival and nominal heads of the Russian determiner phrase (DP), and concomitant agreement with those heads in the clausal domain has not been adequately accounted for under the Probe-Goal hypothesis (Chomsky 2000, 2001) nor the multiple probe approach to Probe-Goal (Carstens 2001). In this paper, building on the multiple agree (MA) analyses of Miyagawa (2001) and Hiraiwa (2001), I propose a modification of the Probe-Goal hypothesis whereby a single probe engages in multiple agreement relations with target goals in the determiner phrase and additionally I propose the featural makeup of the heads of the Russian DP necessary for a multiple agree approach to succeed. With T serving as a single locus of case and feature agreement, and the heads of the DP bearing interpretable agreement features, uniformity between the clausal and nominal domains and within the nominal domain is ensured.

1 Introduction

The Probe-Goal hypothesis of agreement does not straightforwardly account for the necessary uniformity of agreement features (φ -features) and case marking internal to the DP. In (1), gender (feminine), number (singular) and case (nominative) are overtly marked on the determiner, adjectival, and nominal heads of the subject DP.

- (1) èt-a čěrn-aja sobak-a
 this-F.SG.NOM black-F.SG.NOM dog-F.SG.NOM
 pokusi-l-a mal'čik-ov
 bite-PST-F.SG boy-PL.ACC
 'this black dog bit some boys'

The Probe-Goal hypothesis fails to account for this uniformity of features and case-marking within the DP because a probe is barred from multiple agreement relations, becoming inactive after the first instance of Agree (Chomsky 2000, 2001). Within a Probe-Goal approach to agreement, Carstens (2001) has proposed a multiple probe approach to the DP, thereby ensuring that all heads within the Italian DP share features. However, this analysis does not account for languages with overt case-marking on the heads of the DP.

I propose a modification of the Probe-Goal hypothesis, building on the clausal domain Multiple Agree (MA) accounts of Miyagawa (2001) and Hiraiwa (2001). Under my proposal, a single Probe is responsible for entering into Agree operations with all available heads of the DP. Subsequent agreement between the DP and potential higher probes is barred due to the heads of the DP being rendered inactive after their initial Agree relation. Under this proposal, case and ϕ -feature uniformity within the DP as well as clausal agreement are accounted for. This proposal differs from Miyagawa's and Hiraiwa's not only in the domain of operation, but in the means of allowing multiple agreement. It makes further proposals regarding the necessary feature specification of the heads of the determiner phrase. This proposal ensures that:

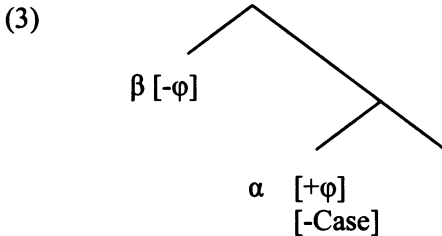
- (2) a. ϕ -features and case features spread throughout the DP
 b. ϕ -features are uniform between the subject DP and the inflectional head of the clause
 c. the spread of ϕ -features and case is constrained to appropriate DPs within the clause

My analysis and proposal proceed in the following manner: In section 2, I detail the Probe-Goal hypothesis of Chomsky (2000, 2001). In section 3, I consider the analysis of Carstens (2001), pointing out the difficulties this account faces in extending to case-marked heads of the determiner

phrase. I then propose a Multiple Agree analysis of the determiner phrase, extending and modifying Miyagawa's (2001) and Hiraiwa's (2001) analyses of multiple agreement in the clausal domain. In so doing, I account for the issues raised in (2) with the effect that clausal and nominal agreement are unified under a single mechanism: Agree. In section 4, I briefly consider additional constructions and show how they can be accommodated within a MA hypothesis.

2 The Probe-Goal Hypothesis of Agreement

Under the Probe-Goal approach (Chomsky 2000, 2001 and references therein), agreement is accounted for by means of a formal relation (Agree) between a head with interface-uninterpretable features (the probe) and a head with matching interface-interpretable features (the goal).¹ The relation Agree is motivated at the point in the derivation at which a head with uninterpretable features merges into the phrase structure and is able to locate within its domain matching interpretable features.



In (3), demonstrating clausal agreement, probe β has one or more uninterpretable φ -features and it probes into its c-command domain to the nearest active head² with a matching feature set. Goal α has interpretable φ -features and crucially, unvalued case, rendering it active

¹ I assume that Probe-Goal is at least as minimal as a head-to-head relation, if not a feature-to-feature relation. This is inferred from Chomsky (2001:4).

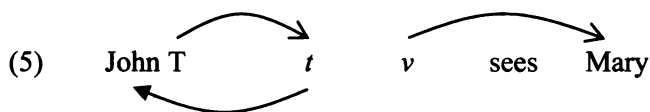
² "Nearest head" refers to the head α such that no other head γ is c-commanded by probe β and in turn c-commands α .

in the derivation.³ After Agree occurs, the uninterpretable features of β are valued and deleted and the case of α is valued and deleted. (The specific value of case depends on probe β : case is nominative when β is T, accusative when β is ν .)

A goal becomes inactive with the valuation and deletion of case, thus rendering it unable to participate in future Agree relations. This parallels Babby's (1985) Principle of Inertness (4).

- (4) Principle of Inertness: No syntactic operation may alter the values of features once they are fixed.

A simplified example from English of the Probe-Goal approach that assumes a probe and goal that are both φ -complete is given in (5). The head ν probes into its domain (depicted with an open arrow) and identifies the noun *Mary* within the lower DP. *Mary* is marked with accusative case and becomes inactive. Although there is no overt reflex of the φ -feature relation between ν and *Mary*, valuation and deletion of φ -features is presumed to take place (or at least to be possible, even if one dismisses this account for English accusative case). At the point in the derivation when T merges, it probes into its domain to agree with the noun *John* in Spec, ν P. The probe operation of T is similar to the probe by ν , but in this instance, overt agreement is evident and appears on T. *John* is marked with nominative case and raises for independent reasons to subject position (shown with a closed arrow). A trace is shown in (5) merely to mark the original position of *John*.



³ For Chomsky (2000:122) structural case is not a feature *per se*, but assigned as a reflex of agreement with an uninterpretable φ -set of the probe. In my analysis, I assume that case is an uninterpretable feature and found only on heads within the nominal domain. Making case simply a reflex of agreement would require loosening the double activation condition necessary for Agree to apply.

T is limited to a single Agree operation, under the standard Probe-Goal analysis. This follows from the stipulation that T, as a probe, has its own uninterpretable features deleted after a single instance of Agree with a ϕ -complete goal, losing its active status and rendering further Agree operations impossible.

Although the Probe-Goal hypothesis can account for the data in English and for similar Russian structures with bare NPs, it does not provide a ready account for the spread of case nor the spread of ϕ -features for more complex DP structures in languages with a richer inflectional system, such as Russian.

The above example demonstrates the Probe-Goal relation between ϕ -complete probes T and ν and ϕ -complete goals. However, if the probe has a defective ϕ -feature set, that is, if it does not carry a full set of gender, number, and person features, the probe still has its own ϕ -features valued and deleted, but the goal remains active (with its case feature unvalued) and still viable to enter into further Agree operations (see e.g. Chomsky 2000:124). The fact that the goal may remain active for subsequent Agree operations is leveraged by Carstens (2001) in her analysis of feature spreading within the DP, as I discuss in section 3.

As Chomsky (2000, 2001) limits the analysis to English data, he does not consider the feature specification (and feature-interpretability) of the determiner and adjective, in parallel to the noun. On the initial assumption that D, A and N heads all bear a full complement of interface-interpretable features, and could thus serve as goals to a T probe, T is still limited to a single Agree relation and would not be able to case-mark more than one head of the DP. Under the Probe-Goal proposal just outlined (Chomsky 2000, 2001), at the point that T merges into the derivation, it seeks the nearest goal (in this case the D that heads the DP) with matching ϕ -features and identifies D as that goal. D is taken to be active by carrying an uninterpretable case feature. Agree occurs and both T and D lose their active status. The derivation will wrongfully exclude (6) on the grounds that A and N also have interface-uninterpretable case features (as shown by the fact that they also display overt case marking, identical to the case of D).

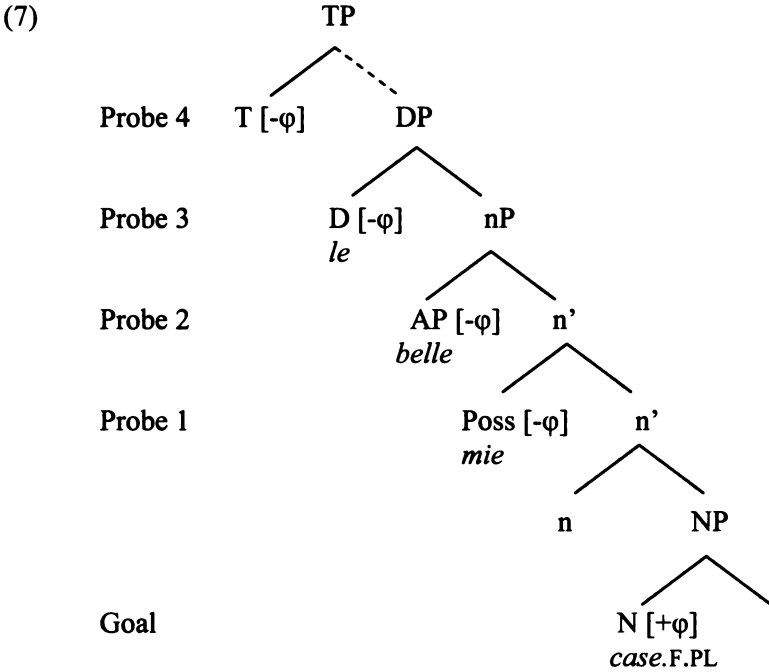
- (6) èt-ot vysok-ij malčik
 this- M.SG.NOM tall-M.SG.NOM boy-M.SG.NOM
 vide-l èt-u vysok-uju butylk-u
 see-PST.M.SG this-F.SG.ACC tall-F.SG.ACC bottle-F.SG.ACC
 ‘this tall boy saw this tall bottle’

An alternative is to assume that T enters into a single Agree operation with the DP maximal projection, resulting in T’s ϕ -features being valued, and in turn case being valued on the DP. This would appear to violate the head-to-head relation of Agree, as well as rely on a subsequent and independent percolation operation to ensure that case features spread throughout the DP, raising questions regarding the serial application of feature percolation.

3 Multiple Agree in the Nominal and Clausal Domains

A productive analysis of multiple agreement within the Probe-Goal hypothesis is developed in detail by Carstens (2001), who applies it to Romance and Bantu data. She exploits the assumption that a goal may remain active after an Agree relation with a defective probe. She additionally argues that case valuation is not an automatic reflex of Agree, but requires Agree with particular case-valuing probes.

Under Carstens’ proposal of Italian agreement, D, A and Poss heads have uninterpretable [- ϕ] features and successively probe N inducing gender and number feature agreement (7).



(8) le mie case belle
 the.F.PL my.F.PL house.F.PL nice.F.PL
 'my nice houses'

N remains active in the derivation and able to be successively probed, either because the D, A and Poss heads are not ϕ -complete (apparently lacking a person feature) or, more likely, because they do not bear case-assignment properties and thus N does not have its case feature valued.⁴ Surface word order (8) is accounted for by both N and Poss raising within the DP, from the structure in (7). Case is not assigned by any of the probes within the DP as they are not of the class of intrinsic structural case-assigners.

⁴ It is not entirely clear from Carstens' proposal which of these points is supported.

While this does provide an account of gender and number agreement within the Italian DP, Carstens does not explicitly provide an analysis for structural case on *case* 'house.' I assume from her analysis that T, as an intrinsic case-assigner, may probe N if the DP that contains it appears in a base-generated subject position, such as Spec, ν P. I have identified this operation as Probe 4 in the phrase structure tree (7); the dashed line linking TP and the DP represents part of the structure irrelevant for this discussion.

This account of a single case-licensing operation between T and N does not account for languages like Russian with a richer morphological system that includes case inflection for adjectivals and determiners. Under Carstens, the D and A heads act as probes because they have uninterpretable ϕ -features and do not bear a case feature. T engages in a single Agree operation with N; additional Agree operations are barred as T is no longer active.

With some modifications, however, the Carstens analysis would be more applicable to Russian. (Although a modified approach to Carstens is not the analysis that I argue for, I present such an approach here to show how it could apply, before offering my own approach that I argue relies on a simpler agreement mechanism.) First, nothing bars a head from acting first as a probe, and in a subsequent Agree operation, as a goal, as long as the head is active for both operations. It was assumed that Probes 1-3 in (7) had uninterpretable ϕ -features, making the probes active for agreement with N (shown as F.PL in (8)). If in addition, the probes had uninterpretable case features not valued under Agree with N, the probes (subsequently serving as goals) would be available for future agreement with a higher probe, such as T. Secondly, to make the Probes 1-3 available as goals later in the derivation, they would need interpretable ϕ -features that matched those of T. If Probes 1-3 had their ϕ -feature sets valued under Agree with N, this would make them eligible to serve as goals of T's Agree. This, however, may be problematic, particularly in light of assumptions that uninterpretable features delete after Agree. Finally, the probe T would need to enter into an Agree operation with all of the heads of the DP to value case on each one. Such a proposal would combine the multiple probe approach with a multiple goal approach.

Another analysis, one used to account for uniformity of case-marking in the clausal domain, is proposed by Hiraiwa (2001). Under

this proposal, a single probe Agrees with and licenses case on multiple goals via ECM in Japanese. An example is given below in (9), where *da* refers to the copula and *no* ‘C’ is an adnominal (possessive) complementizer.

- (9) [John-ga [CP [TP t_i me-wo waru-i] to]
 John-NOM eyes-ACC bad-PRES C
 omoikondei-ta no]-wa Mary-wo_i da
 believe-PST C-TOP Mary-ACC CPL
 ‘It is Mary that John believed her eyes to be bad.’

In (9), both *Mary* and *eyes* are marked with accusative case from the matrix verb ‘believe’ by ECM across the CP. There is no accusative case-valuer available inside the embedded CP and *Mary-wo* raises for reasons independent of case, as Hiraiwa demonstrates. Multiple case-valuation would be impossible under the formulation of Agree whereby each probe is limited to a single instance of Agree – one of the embedded arguments would not have its case feature valued.

To allow for MA operations at the clausal level, Hiraiwa posits [+multiple] which appears as a “probe feature” (Hiraiwa 2001:70), apparently an optionally appearing feature of a feature of the verbal head. [+multiple] ensures a probe remains active even after an Agree operation and forces it to probe and Agree with additional, less local goals in its domain. Because instances of multiple probe occur simultaneously, intervening matching goals do not block an agree operation between a probe and a more distant goal.

This modification of Agree, given the optionality of [+multiple] is empirically accurate and captures the range of data that Hiraiwa examines. However, it does raise certain issues. First, the fact that [+multiple] is a metafeature (and thus unique in the Probe-Goal framework) makes it somewhat suspect. I know of no other “subatomic” conditions on feature expression besides this one. On the other hand, treating [+multiple] as a lexical feature on par with ϕ -features would appear to place it outside the valuation/deletion model of the Probe-Goal hypothesis and Agree; [+multiple] is not matched between the probe and the goal. Another issue that arises is that [+multiple] may be a strong lookahead mechanism, appearing exactly where it is needed to account

for surface data. It can, of course, be argued that [+multiple] is not a lookahead mechanism and that without positing [+multiple] certain grammatical derivations will be ungenerated, giving support for the necessity of [+multiple]. However, all things being equal, if [+multiple] can be eliminated in favor of other independently motivated mechanisms, the Probe-Goal hypothesis will be stronger and more streamlined.

Multiple Agree is also proposed by Miyagawa (2001) to account for uniformity of nominative case-marking in the clausal domain in Japanese. Under this analysis, T may enter into agree relations with multiple DPs in Japanese by virtue of the fact that “a DP or T does not carry a ϕ -feature in any relevant sense” (2001:309). The only formal feature of a DP that is salient to Agree is its uninterpretable case feature. In (10), T Agrees with both *Taro* and *book*, marking them each with nominative case.

- (10) Taroo-ga sono hon-ga yom-e-ta
 Taro-NOM that book-NOM read-can-past
 ‘Taro was able to read that book’

Under this proposal, languages with relatively richer overt ϕ -feature marking bar MA because a probe cannot agree with disparate feature sets, “on the assumption that each DP carries a distinct ϕ -feature...” (2001:309). Where Miyagawa reasons that rich morphology severely limits the use of MA cross-linguistically (bearing in mind that his use of MA refers to multiple DPs marked as nominative, as in (11)), I argue below that rich morphological marking actually provides evidence of MA.

To address the issue of case and ϕ -feature agreement in morphologically rich languages such as Russian, I propose to modify Agree as follows:

- (11) Heads with [- ϕ] features probe all active matching goals within their domain.

Thus, Agree takes place between a single probe and multiple goals, following Hiraiwa (2001) and Miyagawa (2001) and contra Chomsky (2000, 2001). In this way, T serves as a common point of agreement for the heads within the DP⁵ and is consequently marked with the same features. I appeal to the simultaneity of multiple agreement within the DP, following Hiraiwa (2001), to avoid the problem of an intervening goal that would block agreement in less local relationships within the DP. When the probe has satisfied itself and entered into all available Agree relationships, the status of the probe changes to inactive.⁶

Unlike the Carstens analysis, I posit that the heads of the DP all have interpretable ϕ -features, allowing them to serve as goals under Agree (12).⁷ Additionally, I posit that they have a full complement of ϕ -features, thus allowing for the valuation of features on T and the valuation of case on each goal (13).

(12) D, A, and N heads all have interpretable ϕ -features.

(13) D, A, and N heads all have a full complement of ϕ -features.

The notion that D and A have [+ ϕ] features may be unintuitive, but there are grounds to assume that interpretability is strictly a formal interface condition. In languages that inflect for gender, such as Russian, grammatical gender certainly has little or no semantic interpretation and

⁵ My analysis of agreement does not depend on a particular structure of the DP (nor necessarily on the acceptance of the DP Hypothesis).

⁶ It is unclear if eliminating [+multiple] as a specification of Agree, and replacing it with non-optional (11) results in losing an account of mixed case-marked clauses (i):

- (i) John-ga [CP [TP Mary-wo me-ga waru-i] to] omoikondei-ta
 John-NOM Mary-ACC eyes-NOM bad-PRES C believe-PST
 'John thinks that Mary has bad eyesight'

In (i), the arguments of the embedded clause bear accusative (the higher argument) and nominative (the lower argument).

⁷ I argue that the morphological realization of some features is unclear as either multiple features are fused together (such as gender and number) or there is simply no overt reflex to mark lexical items (person on heads in the nominal clause).

is a mere formal agreement marker. If the gender feature on the Russian noun is considered to be an interpretable ϕ -feature, then gender and number on D and A heads are equally interpretable at the interface. Given the proposal that D, A, and N have [+ ϕ] features (12), and the necessity of probes to enter into Agree with all matching goals (11), uniformity of case and ϕ -features in the nominal domain and feature agreement in the clausal domain are accounted for.

Notice, however, that the Agree relations of each probe must be constrained to the relevant domain; case and ϕ -feature agreement is limited. In (14), the subject DP that induces feature agreement in the clausal domain bears independent features from other DPs in the clause. Agree cannot apply indiscriminately throughout the entire clause.

- (14) èt-ot vysok-ij malčik
 this-M.SG.NOM tall-M.SG.NOM boy.M.SG.NOM
 vide-l èt-u vysok-uju butylk-u
 see-PST.M.SG this-F.SG.ACC tall-F.SG.ACC bottle-F.SG.ACC
 ‘this tall boy saw this tall bottle’

Every instance of Agree that the probe enters into must result in the same values of each feature involved in the Agree relation. In a bottom-up derivation of (14), the light verb enters into multiple agreement relations with the heads of the direct object, marking them as accusative. The goals of the direct object DP (or more broadly speaking, any DP) are rendered inactive and unavailable to participate in the Agree operations of a higher probe (T in this case). Thus, an inactive goal may not change its case marking; neither can it induce ϕ -feature agreement on another probe (unless the preceding probes were ϕ -defective as demonstrated in section 2). And because Agree is initiated at the point that a probe merges into the derivation, goals cannot wait to Agree with probes that merge later.

If a mismatch of features appears in the phrase structure, such as in (15), where the features between D and A, on one hand, and N, on the other hand, differ, the derivation will crash. A probe cannot felicitously match its features with heads that differ in ϕ -sets.

- (15) *èt-a vysok-aja malčik
 this-F.SG.NOM tall-F.SG.NOM boy.M.SG.NOM
 ‘this tall boy’

Under Miyagawa’s hypothesis, the locality constraints on probe T are unclear as *hon* ‘book’ may be optionally marked with accusative case instead of nominative (16), cf. (10). Under my approach, if for whatever reason the accusative-licensing probe fails to Agree with the direct object, that DP will be have unvalued case when T merges into the derivation and Agree between that DP and T will occur. (As ϕ -feature marking is not overt, there is no possibility of a feature clash between the nominative DPs.) MA, under my formulation, is a relation between a probe and all possible goals (11).

- (16) Taro-ga sono hon-o yom-e-ta
 Taro-NOM that book-ACC read-can-past
 ‘Taro was able to read that book’

In some ways, the analysis developed here relates to a point made in Chomsky (1986:187): “If the category α has a case to assign, then it may assign it to any element that it governs.” Chomsky explicitly states that a transitive verb may assign its objective case both to an NP and to the Det that the NP dominates. Under this proposal, V could directly assign case to the N head under government. There was no percolation in that analysis, but an allowance for a one-to-many case-assignment relation.

My proposal is an account of feature spread within the DP, as well as agreement at the clausal level and relies on a single mechanism to ensure feature uniformity in both the clausal and nominal domains. The constraint on the agreement mechanism that I propose is one that relies on the active status of goals (17) – (19).

- (17) Agree between a probe and goal requires both to be active.
 (18) A goal becomes inactive when its case feature is valued.
 (19) Multiple Agree operations occur simultaneously.

The theory I have outlined is not meant as a theory to account for all types of case assignment, and is meant primarily as a theory of feature spread. I leave open the possibility that case may be assigned by means other than probe-goal (and yet still inactivate the goal), and that non-structural cases may have other mechanisms to license case. However, inasmuch as case and ϕ -feature uniformity must also obtain in obliquely marked DPs (whether by a verb or by a preposition), the proposal I present here should account for such constructions.

Crosslinguistically, my hypothesis of MA could also accommodate languages like English that are not as overtly marked for case and ϕ -features. In (20), plural number is overtly marked on both the D and N heads, while A does not bear any overt ϕ -features.

(20) those tall ships are crossing the border

It is reasonable to posit that T enters into agreement with D and N (but potentially not with A, if adjectivals do not bear an uninterpretable case in English) and that determiners are case-marked but with no overt reflex in English.

4 Agreement Mismatches

One piece of data that presents difficulties for this analysis (and many others) is from Timberlake (2004:164).

(21) v komnatu voš-l-a nov-yj vrač
 into room enter-PST-F.SG new-M.SG doctor. M.SG
 'into the room entered the new doctor'

In this datum, the subject *novyj vrač* 'new doctor' is masculine singular and should induce similar agreement marking at the clausal level, according to widely accepted agreement rules of Russian and the analysis of agreement that I have developed here. However, certain names of professions, including 'doctor' optionally contravene standard rules of agreement, allowing the clausal inflection to indicate biological gender of the subject under consideration.

This is problematic because under my analysis, T should simultaneously enter into Agree relations with both the adjectival and the

nominal head, concomitantly valuing its own ϕ -features. There should be no difference between the ϕ -features of T and those of the heads of the DP.

However, I argue that (21) can be fruitfully analyzed under my proposal. First of all, there is uniformity within the DP; both heads are marked as singular and masculine which is consistent with my analysis of a locus of agreement external to the DP that ensures agreement within the DP. Secondly, the subject is marked as nominative, which indicates agreement with the clausal head T. The fact that (21) is an optional form and that the clause may also bear masculine singular agreement indicates that this is some form of pragmatic alteration that affects both the LF and PF forms of this structure.

Within the nominal domain, a potentially difficult set of data are the heterogeneous quantified phrases in Russian (see Babby 1987). (22) is an example of a subject phrase with mixed case features, predicted by my MA analysis not to occur. However, as I have argued in Becker (2008), quantified phrases in Russian, especially those of numeral 5 and greater, can be accounted for if the numeral itself is a probe, licensing case and ensuring ϕ -feature uniformity on the N and other heads within its probe domain. The numeral head remains active and enters into an Agree relationship with T, inducing plural features at the clausal level.⁸

- (22) pjat' xorošix student-ov priš-l-i
 five.NOM good- PL.GEN student-PL.GEN arrive-PST-PL
 'five good students arrived'

⁸ Space does not allow me to fully address the numerous issues that arise regarding word order, agreement, and semantic variation, as well as variation in feature marking, especially with the paucal numerals 2-4. For details, see Becker (2008). For an approach to the heterogeneous/homogeneous distinction that utilizes the selection of case-valued DPs and differs from mine, see Rappaport (2002).

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On the Structure of the Serbo-Croatian Noun Phrase: Evidence from Binding*

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There has been a lot of controversy in the literature regarding the structure of NP in Serbo-Croatian (hereafter SC) and in Slavic generally. On the one hand, authors like Bašić (2004), Pereltsvaig (2007), Progovac (1998), and others support the idea of the so-called *Universal DP Hypothesis* (UDPH) by assuming that all languages, including article-less languages like SC, have overtly or covertly realized DP. Authors like Bošković (2005), Corver (1990), Willim (1998), and Zlatić (1997), on the other hand, adopt the view that languages without articles, like SC, do not project DP but rather have only traditional NP projections. The goal of this paper is to compare these two approaches only the latter (no DP) approach makes the correct prediction about a series of binding facts in SC. In sections 1-3, I compare the DP vs. no DP approaches and argue for the lack of DP in SC. In section 4 I discuss implications that this approach has for binding in SC in general.

1 Universal DP Hypothesis vs. DP/NP Parameter Approach

Proponents of the UDPH assume that the structure of noun phrases is universal, regardless of the presence/absence of overt articles in a language. According to this view, the difference between languages with overt articles (such as English) and languages that lack articles (such as SC) is simply PF-based. That is, a D head exists even in languages like SC but it is not pronounced. Thus, Bašić (2004) takes (1) to be the structure for SC noun phrases:

* I am grateful to John Bailyn, Jonathan Bobaljik, Željko Bošković, Susi Wurmbrand and two reviewers for valuable comments and suggestions. All shortcomings are mine.

- (1) [DP ovaj [D' D [PossP njegov [Poss' Poss [α_P veliki [α' α [NP sused]]]]]]]]
 this his big neighbor
 'This big neighbor of his'

Following Cinque (1994), Bašić argues that attributive adjectives in SC are generated in specifiers of functional projections (labeled α_P) dominating the NP. Furthermore, demonstratives and possessives are assumed to occupy the specifier positions of DP and PossP, respectively, which both have null heads and are projected on top of the functional spine of the noun phrase. In Bašić's analysis, the agreement displayed by prenominal elements does not imply that they need to be generated inside of the NP. Following Julien's (2002) analysis of agreement in Scandinavian DPs, which is also successfully extended to the clausal level, Bašić assumes that agreement in SC DPs can be established between the noun and prenominal elements base-generated in higher specifier positions.

In contrast to the view represented by the UDPH that the phrase structure of the nominal domain is universal, Bošković (2008) observes that languages without articles syntactically and semantically differ from languages with articles in a systematic way.¹ In light of these facts, Bošković argues that there is a fundamental difference between the two language groups in that languages like SC do not project a DP at all. Along the lines of Corver (1990), Bošković (2008) (see also Bošković, 2005) proposes a DP/NP parameter whereby all of the noted differences are analyzed as a consequence of the lack of DP in languages without articles. Hence, according to this view, in languages without overt articles, the structure of the noun phrases is (2), instead of (1):

- (2) [NP Demonstr. [N' Poss. [N' AP[N' N]]]] (Bošković, 2005)

In (2), prenominal elements modifying the noun and agreeing with it in case, number and gender are positioned in multiple specifiers of NP.

The question that arises in a situation like this is what the advantages and disadvantages of preferring one theory over the other are, i.e., which

¹ Left branch extraction, adjunct extraction, scrambling, and negative raising, are just some of the phenomena discussed in Bošković (2008) in this respect.

of the two competing theories can capture more facts by making fewer assumptions. Everything else being equal, if we grant the claim that the DP/NP Parameter approach can capture a broader range of cross-linguistic observations (see fn. 1), the question is whether there is anything that the UDPH gives us that the DP/NP Parameter approach is unable to account for. Proponents of the UDPH claim that there is - according to them only (1), and not (2), (i) directly derives the adjective ordering restrictions from the phrase structure, and does not need to stipulate it by some external mechanism, and (ii) finds straightforward support in Kayne's (1994) Antisymmetry of syntax, since contrary to the traditional adjunction hypothesis which must stipulate the fact that APs appear to the left of the nouns they modify, Kayne's approach predicts that there is always one single specifier per projection and that that specifier must be on the left.

The first argument, which is due to Cinque (1994, 1999), has been seriously challenged on independent grounds, both empirically and conceptually. Without going into details of the arguments for and against Cinque's proposal, I will simply assume that there is no evidence which conclusively shows that assigning the adjective ordering restrictions to the phrase structure would be any less stipulative than analyzing them as a property of some syntax-external (semantic) mechanism.²

The second argument, however, is directly relevant for this paper. For this theoretical argument about the position and number of specifiers per projection to carry weight, an account would need to adopt the antisymmetric view of syntax, with all possible consequences. In what follows, I show that adopting both a universal DP structure and the system proposed in Kayne (1994) is untenable for SC. Since, under the UDPH, the structure in (1) is the structure for noun phrases in both English and SC, these two languages should not crucially differ in their syntactic behavior. In the following sections, I argue that this is not correct and that English and SC differ systematically in their binding properties. In section 3, I show that this difference is best captured by assuming different noun phrase structures for these two languages (along the lines of (1) vs. (2)).

² See Bobaljik (1999), Ernst (2002), and Shaer (1998), among others, for arguments against Cinque's view of adverbs, some of which can also be extended to his treatment of adjectives; see Bošković, to appear, for the criticism of his analysis of adjectives.

2 Kayne (1994)

Assuming a standard DP structure as in (5) for English, the grammaticality of (3)-(4) is as expected: being in specifiers of subject DPs, the possessives *his_i* and *John_i* do not c-command *John_i* and *him_i*, respectively, and thus do not induce violations of Conditions C and B.

(3) *His_i father considers John_i highly intelligent.*

(4) *John_i's father considers him_i highly intelligent.*

(5) $[_{DP} \text{ POSS. } [_{D'} D [_{NP} \text{ NP}]]]$ (Standard Approach)

However, under Kayne's Antisymmetry approach, specifiers are adjuncts and, by virtue of the definition of c-command given in (6) they c-command out of the category they are adjoined to/are specifiers of:


(6) X c-commands Y iff X and Y are categories, X excludes Y and every category that dominates X dominates Y (X excludes Y if no segment of X dominates Y).

Given this, (3) and (4) would be incorrectly predicted to be ungrammatical under the structure in (5), since *his_i* and *John_i* are dominated only by a segment of the subject DP, and therefore do c-command *John_i* and *him_i*, violating Conditions C and B. Kayne makes two important assumptions to resolve this problem. First, following Szabolcsi's (1983) analysis of Hungarian possessives, he observes that in many languages, the possessor is preceded by an independent D, much as in the Italian example in (7):

(7) *il mio libro*
 the my book

Kayne therefore proposes that in English, too, the prenominal possessor is the specifier of a PossP, which in turn is dominated by a DP with a null D head (see (8)). (3) and (4) are then accounted for: the

additional null DP projected above the possessor prevents *his*, and *John*, from c-commanding co-indexed elements outside the DP-structure.

- (8) [DP ... [D' D [_{POSSP} John [_{POSS} 's [_{NP} father]]]]].

 Operator Position

Second, also following Szabolcsi, the specifier of the null DP is argued to be an exclusive operator position, which although essential to operator binding of a pronoun qua variable, is irrelevant to Conditions A, B and C of the binding theory. Kayne proposes that quantificational possessor phrases move up to this position at LF. Motivation for this movement comes from examples such as (9)-(10).³

(9) Every girl's father thinks she is a genius.

(10) *Every girl's father admires herself.

Now returning to the question of how this relates to the structure of SC noun phrases, we see that (8) resembles (1) in one significant way: they both have a null DP above the possessor. Under Kayne's approach, this projection plays a very important role, since (i) it is necessary to explain the facts in (3) and (4) in a way consistent with the assumption that 'specifiers' c-command out of their projections and (ii) by making certain assumptions about the character of this projection's specifier position, we seem to be able to account for an interesting operator-variable paradigm in English.

Obviously, we need to ask whether the null DP in (1) plays any significant role in SC. If it does, and if the argument from Antisymmetry holds, we expect SC binding facts not to crucially differ from English, i.e., the null DP above the possessor should prevent an illicit c-command relationship between the possessor and co-indexed elements in the

³ In (9)-(10), the QPs 'every girl' undergo covert movement to the specifier of DP. Since from this position, the QPs c-command the rest of the sentence, a bound variable interpretation of the pronoun *she* in (9) is legitimate. (10), on the other hand, is still excluded, since it is assumed that the operator cannot license a reflexive from this position (see Kayne, 1994, and references therein for details of the analysis).

sentence. I turn now to SC and the relevant binding data, which will show that this prediction is not correct.

3 SC Binding Facts

3.1 Against a DP in SC noun phrases

(11)-(12) are the SC counterparts of (3)-(4).

(11) *Njegov_i otac smatra Marka_i veoma pametnim.
 his father_{NOM} considers Marko_{ACC} very smart
 ‘His_i father considers Marko_i highly intelligent.’

(12) *Markov_i otac smatra njega_i veoma pametnim.
 Marko’s father_{NOM} consider him_{ACC} very smart
 ‘Marko_i’s father considers him_i highly intelligent.’

The clear ungrammaticality of these examples directly suggests that possessors in SC do c-command out of the subject noun phrases they modify, thus inducing Condition C and B violations, respectively. If there were no essential difference in the phrase structure of the nominal domain between English and SC, as suggested by the UDPH, we would not expect the two languages to significantly differ with respect to binding. More precisely, if an argument can be made that the UDPH finds support in Kayne’s view of syntax, in that, among other things, the position and number of specifiers per projection need not be stipulated, then the null DP in (1) should block possessors from violating binding conditions in exactly the same way the null DP in (8) makes the indicated coreference possible.

Notice that the status of these examples does not improve with the addition of a demonstrative, which given (1) should be a clear indicator of the null DP. (13) is, in that respect, as unacceptable as (11) is:

(13) *_{[NP} Ovaj _{[N’} njegov_i _{[N’} drug]]] smatra Marka_i pametnim.
 this his friend_{NOM} considers Marko_{ACC} smart
 ‘This friend of his_i considers Marko_i smart.’

Thus, even the weaker assumption that the DP in (1) is present only when the demonstrative is overt cannot explain the paradigm (11)-(13).^{4 5}

Lastly, (14) and (15) show that it is not the case that Conditions B and C do not apply in SC at all. When the relevant element is embedded in the complement of the noun, no binding conditions violations arise:

(14) Onaj ko voli Marko_i, voli i njegovu_i braću.
 that who loves Marko_{ACC} loves and his brothers_{ACC}
 ‘The one who loves Marko_i loves his_i brothers too.’

(15) Onaj ko voli njegovu_i braću, voli i Marko_i.
 that who loves his brothers_{ACC} loves and Marko_{ACC}
 ‘The one who loves his_i brothers loves Marko_i too.’

Now, it might appear from the discussion above that I adopt Kayne’s view of syntax, since I argue that specifiers c-command out of their projections, and at the same time, allow for the existence of multiple specifiers by adopting the DP/NP Parameter approach, which violates one of the core aspects of Antisymmetry. This, however, is not correct, i.e., I do not adopt Kayne’s theory, and I depart from the DP/NP Parameter approach in that I assume that the nominal modifiers in question are not in multiple specifiers, but are rather simply adjoined to NP, as in (16) (see Bošković, 2005, for the discussion of this structure).

(16) [_{NP} Demonstr. [_{NP} POSS. [_{NP} AP[_{NP} N]]]]

⁴ It has been pointed out that (12) might be bad because the pronoun involved has a strong form, and not the weak/clitic form, and that the sentence somehow “improves” with the clitic form *ga* (but still stays ungrammatical). I take that this only reflects the well-known cross-linguistic fact that strong form pronouns generally introduce new referents (see Cardinaletti and Starke 1999), and that (12), in addition to violating Condition B, sounds awkward since the pronoun refers to something already introduced and present in the sentence. Replacing the strong form with the clitic would possibly remove this awkwardness, but not the Condition B violation effects. See Despić (2008; to appear) for details, where I also discuss the featural make-up of two types of pronouns, and their corresponding syntactic and semantic characteristics.

⁵ An anonymous reviewer, to the extent that he/she is bilingual, finds (11) (and (13)) to be equally (un)grammatical in both English and SC - one or two question marks. All of my SC informants (none of which is bilingual), however, straightforwardly rejected (11)-(13), whereas it seems to be well established that many English speakers easily accept English counterparts, even though they may not find them very natural.

Assuming (16), the ungrammaticality of (11)-(13) is still accounted for, since possessors, as adjuncts (and segments), c-command out of subjects they modify, and, hence, violate binding conditions.

3.2 Adjectival ‘Many’ and Genitive of Quantification ‘Many’

Additional evidence that shows that (1) makes incorrect predictions as far as binding is concerned comes from two different forms of the quantifier ‘many’ in SC. One of the forms, like other pronominal modifiers discussed so far, agrees with the noun phrase in case, number and gender, and according to the DP/NP Parameter approach is in the specifier of NP. The Genitive of Quantification (GenQ) ‘many’, on the other hand, takes the noun as its complement, assigns genitive case to that noun, and triggers default agreement on the verb (3rd person neuter singular). Arguably, in contrast to adjectival ‘many’, it projects a QP of its own (see Bošković 2006 and Franks 1994 for details). Due to the presence of this QP, structures including the GenQ ‘many’ should minimally differ from the ones with adjectival ‘many’ with respect to binding if the assumptions made by the DP/NP Parameter approach are correct. The UDPH, on the other hand, predicts that no difference should exist between the two in this respect – neither of them should violate binding conditions. (17a-b) below indicate that the DP/NP approach predictions are on the right track, since there appears to be a contrast between the two, at least for some speakers:

(17)a. Adjectival ‘Many’

?? [_{NP} Mnogi [_{NP} Dejanovi_i [_{NP} prijatelji]]] su njega_i kritikovali.
 many_{NOM} Dejan_i’_SNOM friends_SNOM are him_i criticize_{PL,M}

b. Genitive of Quantification ‘Many’

[QP [Q Mnogo [_{NP} Dejanovih_i [_{NP} prijatelja]]]] je njega_i kritikovalo.
 many Dejan_i’_SGEN friends_SGEN . is him_i criticize_{SG,N}
 ‘Many of Dejan_i’s friends criticized him_i.’

Since the GenQ ‘many’ projects a QP above the NP, the possessor does not c-command *njega_i* and (17b) is good. The degraded status of (17a), on the other hand, is on this view accounted for by assuming that

adjectival ‘many’ is just another segment and does not block the illicit c-command relationship between the possessor *Dejanovih_i* and *njega_i*.⁶

In this section I argued, contra the UDPH structure in (1), that it is the lack of DP in SC, and the assumption that nominal modifiers can c-command out of their noun phrases, that can effectively explain the difference between English and SC. Note, however, that I am arguing only against the strongest version of the UDPH, namely that all languages have the same structure in the nominal domain, and that the apparent overt differences reflect only PF phenomena. Given (17) above, I am clearly not arguing against the possibility that functional projections such as the QP, could project above the NP, but they must be empirically motivated and not stipulated as a universal property.⁷

4 Further Implications: Binding in SC

The analysis presented in the previous section has important consequences for other binding properties in SC. Due to space limitations I focus here only on one interesting phenomenon, namely the lack of Condition C effects in examples such as (18).⁸ Given the status of (11)-(12), and in particular the claim that in SC possessors c-command out of the noun phrases they modify, the straightforward acceptability of (18) appears to be somewhat unexpected.

- (18) Markov_i prijatelji poštuju Marka_i.
 Marko’s friends_{NOM} respect Marko_{ACC}
 ‘Marko_i’s friends respect Marko_i.’

The lack of a Condition C effect in (18) becomes even more puzzling when compared to (19), which, under the current analysis, involves the

⁶ Some speakers, including an anonymous reviewer, find both sentences equally acceptable, which in essence is not too problematic for this approach, since each of these quantifiers can be taken to project a QP of its own on the top of the NP, regardless of the differences in agreement.

⁷ By the lack of DP, I therefore assume the lack of a battery of functional projections dominating NP, which are usually taken to be universal. As for the structure of pronouns, I discuss it in Despić (2008; to appear), where I essentially take that clitic pronouns are simple heads, whereas strong pronouns project NPs.

⁸ See Despić (2008) for a discussion of several other important binding facts in SC.

same c-command relation between the two R-expressions as (18), yet is ungrammatical.

- (19) *Marko_i poštuje Marka_i.
 Marko_{NOM} respects Marko_{ACC}
 ‘Marko_i respects Marko_i.’

Note, however, that (20)-(21) are much more degraded than (19).

- (20) ** On_i poštuje Marka_i.
 He_{NOM} respects Marko_{ACC}
 ‘He_i respects Marko_i.’

- (21) ** Marko_i poštuje njega_i.
 Marko_{NOM} respects him_{ACC}
 ‘Marko_i respects him_i.’

The problem can therefore be stated as follows: (i) why can an R-expression in the object position be anteceded by a c-commanding R-expression which is the possessor of the subject, but not an R-expression which is the subject itself; (ii) why is this apparent grammaticality limited only to two R-expressions (recall from (11)-(12) that any other combination of pronouns and R-expressions in this type of construction is ungrammatical); and (iii) can this fact be related to the observation that (19) substantially differs in acceptability from (20) and (21)?

To answer these questions, I first assume a more restricted version of Condition C. That is, Lasnik (1989) notices that Condition C effects vary cross-linguistically, and that the variation is parametric in an interesting way. In Thai, for instance, a sentence like (19) is fully acceptable. However, if the subject R-expression is replaced by a pronoun, (19) becomes impossible. On the basis of this, Lasnik concludes that Condition C, unlike Conditions A and B, involves reference to both the binder and bindee. Lasnik’s version of Condition C is given in (22):

- (22) An R-expression is pronoun-free.

Taking this definition to apply in SC as well, we may now be able to account for the difference between (19) and (20), i.e., only (20) violates

Condition C, and even though (19) is unacceptable, this cannot be due to a Condition C violation, but rather something else. Note that the ungrammaticality of (11) is also still accounted for under this revised formulation of Condition C. The questions that still remain, however, are what is (19) a violation of, and depending on the answer to that question, why is (18) good?

In short, my account consists of two parts. First, I assume that standard binding conditions (with Condition C as in (22)) apply in SC. More specifically, Conditions A/B/C are syntactic conditions, which rule out derivations not conforming to them. In that sense, (20)-(21) violate Conditions C and B, respectively, and are for that reason considerably worse than (19), which does not violate any of the binding conditions.

Second, I assume, following a great deal of work in this direction (Burzio 1998; Kiparsky 2002, Richards 1997, Safir 2004, among others), that a sort of economy principle is at work in SC, and that this principle regulates the distribution of reflexives and pronouns/names, i.e., it gives preference to reflexives if the meaning expressed is that of a bound variable, while it allows a pronoun/name if there is a semantic contribution not expressible by anaphors.

For the present purposes it is sufficient to say that the SC reflexive *sebe* and its possessive form *voj* are similar to Norwegian *seg selv* and Japanese *zibun-zisin* in that they are strictly subject-oriented and local. Both of these elements are specified only for case, and can be bound by elements of any gender and number. In terms of competition, this makes them the most dependent elements of all the possible types of reflexives, and, thus, the most economical ones (see Richards 1997). The economy principle that I assume is in a way similar to the well-known Rule-I introduced by Reinhart, which was intended to capture the distribution of *coreference* and *coindexation*, but it differs from it in that it, among other things, still assumes regular binding conditions.⁹ The idea behind this principle is that in standard subject-object cases, the best (most economical) way to express coreference is by means of reflexives. That is, the basic meaning of respecting oneself in (19) (Marko (λx (x respects x))) is expressible with the reflexive *sebe*, as in (23). If a reflexive is not

⁹ Reinhart's (1983) Rule I: NP A cannot corefer with NP B if replacing A with C, C a variable A-bound by B, yields an indistinguishable interpretation.

employed where it could be, then the use of a name/pronoun is only possible when the speaker has some reason to avoid expressing the structure with a bound variable.

- (23) Marko_i poštuje sebe_i.
 Marko_{NOM} respects self_{ACC}
 ‘Marko_i respects himself_i.’

Theories of obviation and competition also rely on various descendants of Rule I, in one way or another. For Burzio (1991, 1998) the competition is defined in terms of morphological features of elements in the hierarchy, whereas Safir (2004) contends that a competitive principle of *syntax* derives complementary distributions of potentially dependent forms. Although these theories make different predictions overall, the basic intuition is the same – the availability of a more dependent form obviates the use of a less dependent one. They all predict that the availability of *sebe* in (23) should somehow render (19) ungrammatical with the intended meaning of respecting oneself. Given a suitable context, which forces a different meaning, (19) becomes acceptable. Consider in this respect (24) adapted from Evans (1980):

- (24) Znam šta Ana, Milan i Marko imaju zajedničko. Ana poštuje
 I know what Ana Milan and Marko have common Ana respects
 Marka, Milan poštuje Marka, a i Marko poštuje Marka.
 Marko_{ACC} Milan respects Marko_{ACC} and Marko respects Marko_{ACC}
 ‘I know what Ana, Milan and Marko have in common. Ana respects
 Marko, Milan respects Marko and Marko respects Marko.’

Here we are talking about a property, which is shared by Ana, Milan and Marko. When applied only to (19), the property of respecting Marko is indistinguishable from the bound variable interpretation of respecting oneself, but in the context of (24), the property shared by Ana, Milan and Marko is only the property of respecting Marko and not the property of respecting oneself. Given the difference in meaning, (23) and (24) do not compete, and the less economical structure in (24) becomes acceptable.

I propose then that (19) is ruled out by an economy principle, whereby the availability of *sebe* (cf. (23)) obviates the R-expression and the pronoun (as in (21)). Given (22), (19) does not violate Condition C,

i.e., the R-expression is pronoun-free. (20)-(21), however, violate both the economy principle (*sebe* is available in the object position in both examples), and conditions C and B, respectively. The substantial difference in acceptability of these examples, thus, may be explained.

The answer to the final question of why (18) is always grammatical, even without a context that would license an interpretation distinguishable from bound anaphora, now follows straightforwardly. First, Condition C is not violated since *Marko* in the object position is pronoun-free. Second, given the strict subject orientation of *sebe*, there are no alternative structures for (18) involving a reflexive which would qualify as more economical. Consider (25) where the lower instance of *Marko* is replaced with a reflexive or a pronoun.

- (25) a. *Markovi_i prijatelji poštuju sebe_i.
 Marko's friends_{NOM} respect self_{ACC}
 b. *Markovi_i prijatelji poštuju njega_i.
 Marko's friends_{NOM} respect him_{ACC}

(25a) is ungrammatical since *sebe* is subject oriented and cannot be anteceded by the possessor of the subject, and (25b) is a Condition B violation (recall that the possessor c-commands out of the subject). Note that (25b) does not violate the economy principle since the reflexive is out of the competition, and therefore is less degraded than (21). Alternatively, replacing the higher instance of *Marko* in (18) with a reflexive or a pronoun is also excluded. (26a) is a Condition A violation, and (26b) is a Condition C violation (assuming (22)).

- (26) a. *Svoji_i prijatelji poštuju Marka_i.
 Self's friends_{NOM} respect Marko_{ACC}
 b. *Njegovi_i prijatelji poštuju Marka_i.
 His friends_{NOM} respect Marko_{ACC}

Therefore, (18) is not ruled out by anything, and is correctly predicted to be grammatical.¹⁰

¹⁰ Competitive approaches to anaphora, (e.g., Safir, 2004) take the existence of anti-subject orientated pronouns to follow from the distribution of subject-oriented anaphors.

To summarize, I have argued in this section that the contrast between SC (11)-(12) and (18), as well as additional binding facts, can be accounted for if one assumes that (i) possessors c-command out of their phrases, (ii) Condition C in SC is as defined in (22), and (iii) in addition to standard binding conditions, SC also employs an economy principle, which regulates the distribution of reflexives.

5 Conclusion

In this paper I have compared two approaches to the structure of the SC NP and concluded that the DP/NP Parameter approach fares better than the UDPH in light of binding in SC. I have argued that only the view that allows SC prenominal modifiers to c-command out of their noun phrases can handle the facts in a consistent way. In the last section I also discussed certain implications that this proposal has for the general theory of binding in SC. I leave for future research the investigation of a possible correlation between binding facts of this type and the existence of D in other languages.

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N-words in the Syntax of Russian and Spanish*

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The purpose of this article is twofold: first, to explain how freestanding n-words (negative concord items) are licensed in Russian, and second, to explore the question whether Spanish and Russian n-words differ in negativity. In the first part of the paper, I present an empirical generalization about the distribution of freestanding n-words in Russian. The main focus of the paper is explaining this generalization. I argue, based on the availability of double negation (DN) readings of freestanding n-words when sentential negation (SN) is present, that there are two negative heads in Russian, SN *ne* and \emptyset_{NEG} . Freestanding n-words are in fact licensed by \emptyset_{NEG} . Following Zanuttini (1996), I argue that SN *ne* co-occurs with TP, and \emptyset_{NEG} is the elsewhere case.

In the second part of the paper, I compare Russian and Spanish n-words. The central issue is a reanalysis of some evidence of negativity of Spanish n-words. I propose that the difference in negativity between Russian and Spanish n-words may be apparent. The real difference is in the way metalinguistic negation (MN) is expressed in the examples in question: it is phonologically null in Spanish but overt in Russian.

1 Russian Data on Negative Concord and Freestanding N-words

It is well known (Brown 1999, etc.) that Russian n-words require clausemate SN (1a). The only reading (1a) has is negative concord (NC).

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A DN reading arises if another interpretable negative element is added to the sentence containing SN and an n-word (1b).

- (1) a. Ivan ***(ne)** znaet ničego.
 Ivan Neg knows n-what
 ‘Ivan does not know anything.’
 b. **Nepravda**, čto Ivan **ne** znaet ničego.
 not-truth that Ivan Neg knows n-what.
 ‘It’s not the case that Ivan knows nothing.’ (i.e., I knows something)

Brown (1999) provides a checking theory-based approach to Russian n-words based on Chomsky (1995). The SN morpheme *ne* carries an interpretable negative feature iF_{NEG} and heads the NegP projection. N-words carry uninterpretable negative features uF_{NEG} and raise to Spec, NegP¹ to check uF_{NEG} against the iF_{NEG} of *ne* (2):

- (2) [_{NEGP} *nikogo* [_{NEG} *ne* ...]]
 uF_{Neg} iF_{Neg}

Notice, however, that Russian n-words can also appear freestanding (3).

- (3) a. Kto byl ničem, tot stanet vsem.
 who was n-what, that-person become everything.Instr
 ‘Those who were nothing will become everything.’
 b. Vanja sčital Iru nikem.
 Vanja considered Ira n-who.Instr
 ‘Vanja considered Ira a nobody’
 c. Ty javilas’ iz niotkuda i isčezla v nikuda.
 you came from n-where and disappeared into n-where
 ‘You came from nowhere and disappeared into nowhere’

In the theory of Brown (1999), the sentences in (3) are ungrammatical since there is no SN present to check off the uF_{NEG} feature of the n-

¹ Evidence for this movement comes from the fact that an n-word object is more natural in the pre-verbal position in neutral speech, although other objects in Russian are pronounced in the post-verbal position in neutral speech.

words. Nevertheless, the sentences in (3) are grammatical. Billings (1997) and Harves (1998) suggest that freestanding n-words are different lexical items from the ordinary n-words in that they do not need licensing by SN, but this proposal cannot account for the full range of data.

I will pursue the hypothesis that the n-words in (2) and (3) are the same lexical items and a syntactic explanation exists for the grammaticality of the sentences in (3). The reason for thinking of (3) syntactically is restricted distribution of freestanding n-words. The following generalization holds:

(4) GENERALIZATION: freestanding n-words in Russian occur in small clause predicates (3a, b) and complements of prepositions (3c).

2 Phonologically null negative head in the structure of small clauses and PPs

2.1 Small Clauses

Small clauses with n-word predicates provide a clear argument for the existence of a phonologically null negative head. Recall that n-words licensed by SN allow only the NC reading. In contrast, freestanding n-words can lead to DN readings if a negative element is present in the sentence:

- (5) a. Vanja sčital Iru nikem.
 Vanja considered Ira n-who
 ‘Vanja considered Ira a nobody.’
- b. Vanja ne sčital Iru nikem.
 Vanja not considered Ira.ACC n-who.Instr
 ‘Vanja did not consider Ira a nobody.’ (he considered her somebody) DN
 ‘Vanja did not consider Ira anybody’ (i.e., he had no opinion of her) NC

Compare (5b) on the DN reading to (1b). (1b) has two interpretable negative elements. This must also be the case for (5b) on the DN reading. One negative element is SN, what is the other one? On the assumption that freestanding n-words and n-words licensed by SN are the same lexical items, the n-word is licensed in both sentences in (5). I suggest that on the NC reading in (5b), it is licensed by SN, but in (5a) and on the

DN reading of (5b), it is licensed by a phonologically null negative head \emptyset_{NEG} . The two negative elements in (5b), then, are SN and \emptyset_{NEG} .

What exactly is the structure of (5b) on the DN and NC readings? According to Baker (2003), Ns and As form predicates with the help of the functional category Pred(ication). On his theory, the structure of a small clause (complement of *consider*-type verbs or a small clause underlying a copula sentence) in Russian will be as in (6a). (6b,c) are partial structures of a sentence containing a small clause with an n-word predicate. In (6b) the n-word is licensed by SN, and in (6c) - by \emptyset_{NEG} .

- (6) a. [PREDP NP [PRED' \emptyset_{Pred} [NP/AP ...]]]
 b. NC: [ne V NP_i [PREDP t_i [\emptyset_{Pred} [NP/AP n-word]]]]
 c. DN: [ne V NP_i [NEGP \emptyset_{Neg} [PREDP t_i [\emptyset_{Pred} [NP/AP n-word]]]]]

2.2 Prepositional Phrases

There exist a number of arguments that PPs have clausal structure (see Den Dikken 2006, among others). In this paper, I follow Bošković (2004), who argues that the extended projection of PP is a CP because object shift induced by quantifier float, cliticization and case assignment apply with similar locality restrictions at both PP and CP level. He concludes that in a Germanic PP, the complement of P can make two movement steps (for Case and object shift), and the P itself can make three. All these movements are shown in Icelandic (7), which involves object shift that strands a floating quantifier. The highest projection in the functional layer of PP is a CP.

- (7) ?Ég talaði (i gaer) [PP^{CP} við_j [OP stúdentana_i t_j [AGRP [alla t_i] t_j [PP t_j t_i]]]]
 I talked yesterday with the-students all

Russian has no Icelandic object shift, but it does have movement in PPs (8). I assume, based on Baker (2003), Bowers (1993) that the minimal requirement for clausal status for a non-verbal phrase is PredP. Then, the extended PP in (8) is a PP^{CP} with a structure similar to the Icelandic (7):

- (8) Ivan igral [PP^{CP} s_j det'mi_i (so)_j vsemi t_i / (s) etimi t_i t_j t_j t_i].
 Ivan played with kids.Inst (with) all.Instr.PI/(with) these.Instr.PI.
 'Ivan played with all the kids.'

Another crucial ingredient of my analysis is the observation in Progovac (2005) that adjunct PPs of manner (9a) and reason (9b) but not time (10c) and place (10d) can have their own NegP² in Serbian.

- (9)a. Rekao je to sa n-i-malo zlobe. (Progovac 2005)
Said.3sg. Aux that with not-even-little malice
'He said that with no malice.'
- b. On plače zbog ničega. (Progovac 2005)
He cries for nothing
'He is crying for nothing/without a reason.'
- c. On *(ne) zastaje nijednog trenutka. (Based on Progovac 2005)
He Neg pauses no moment
'He doesn't pause for a minute.'
- b. On *(ne) ide ni na jednu konferenciju.
He Neg goes no at one conference
'He doesn't go to a single conference.'

Progovac concludes that since adjunct PPs of manner and reason admit freestanding n-words, they must contain a functional projection whose head licenses them, NegP. PPs of time and place, in contrast, cannot have a NegP.

Based on these considerations, the structure of an extended PP (PP^{CP}) in Russian is (at least) (10a). (10b,c) are partial structures of sentences containing a PP^{CP} with an n-word complement. In (10b), the n-word is licensed by SN, in (10c) the n-word is licensed by \emptyset_{Neg} .

- (10) a. [PP^{CP} [PREDP \emptyset_{Pred} [PP ...]]]
b. NC: [... *ne* V [PP^{CP} [PREDP \emptyset_{Pred} [PP P n-word]]]]]
c. DN: [... *ne* V [PP^{CP} [NEGP \emptyset_{Neg} [PREDP \emptyset_{Pred} [PP P n-word]]]]]

What evidence is there that Russian PP^{CP}s can have a NegP headed by \emptyset_{NEG} ? First, similarly to Serbo-Croatian, Russian PP^{CP}s admit freestanding n-words (3c), (11a).³ Moreover, if SN is present in a sentence

² For Progovac (2005), it is a Pol(arity)P, but the difference does not affect my argument.

³ Notice that in contrast to Serbo-Croatian, in Russian the option of licensing freestanding n-words is not limited to adjuncts.

containing a PP^{CP} with a freestanding n-word complement, DN reading results (11b). The DN reading indicates the presence of \emptyset_{NEG} , see (11c):

- (11) a. *Krupnye predprijatija pojavljajutsja iz niotkuda.*
 large factories appear from n-where
 ‘Large factories come from nowhere.’
- b. *Krupnye predprijatija ne pojavljajutsja iz niotkuda.*
 large factories Neg appear from n-where
 ‘Large factories don’t come from nowhere’ *NC, DN
- c. $[TP \dots [NEGP \textit{ne} \dots [PP^{CP} [NEGP \emptyset_{Neg} [PREDP \emptyset_{Pred} [PP \textit{iz} [NP \textit{niotkuda}]]]]]]]]]$

Note that NegP is not required in a PP^{CP} ; in fact, n-word in a PP^{CP} can be licensed by SN. The resulting reading is NC, as in (12).

- (12) a. *Ivan ne govorit gadostej ni pro kogo.*
 Ivan Neg says bad things n about who
 ‘Ivan does not say bad things about anybody.’ NC, *DN
- b. $[TP \textit{Ivan ne govorit gadostej} [PP^{CP} [PREDP [PP \textit{ni pro kogo}]]]]]$

2.3 Negative Heads and the Meaning of Freestanding N-words

Having two different negative heads gives two advantages. First, we do not need to postulate that Russian freestanding n-words carry negative force. Second, we can now explain the fact that Russian freestanding n-words sometimes have a derogatory or mysterious shade of meaning, but n-words licensed by SN never do. For illustration, consider (13). (13a) has a derogatory flavor: in Vanja’s opinion, Ira is a worthless person. (13b) has a flavor of mystery: the points of departure and destination resist description. (13c) is neutral; the destination is unidentified.

- (13) a. *Vanja sčital Iru nikem.*
 Vanja considered Ira.Acc n-who
 ‘Vanja considered Ira a nobody.’
- b. *Doroga vela iz niotkuda v nikuda.*
 Road led from n-where to n-where
 ‘The road went from nowhere to nowhere.’
- c. *Sem’ju Prokof’evyx vyseljaut v nikuda.*
 Family.Acc Prokofiev.Pl.Gen evict.pl into n-where
 ‘The Prokofiev family are being evicted and have nowhere to go.’

It is reasonable to trace this difference in meaning to the different licensors. We have seen that the relationship of n-words with SN results in NC readings. Their relationship with \emptyset_{Neg} must be more complicated. Suppose that \emptyset_{Neg} not only licenses n-words, but also introduces a restriction on the quantifier to entities that are identified⁴. As a consequence, in the discourse freestanding n-words can acquire a derogatory or mysterious flavor because the entities they refer to are not in the domain of identified objects.

I suggest that this ability to restrict the quantifier to identified individuals is a lexical property of \emptyset_{Neg} . It is crucially not a property of n-words themselves⁵. This explains why, for instance, (14) is not a grammatical sentence meaning that the music will grow old at an unidentified point in time or space.

- (14) *Eta muzyka nikogda/nigde ustareet.
 This music n-when/n-where become old-fashioned

2.4 Difference between PP^{CP} s and Small Clauses

Notice that there is a sharp contrast between small clauses and PP^{CP} s: only small clauses are ambiguous between NC and DN readings when the matrix clause is negated (15), (16).

- (15) Vanja ne sčital Iru nikem.
 Vanja Neg considered Ira.Acc n-who.Instr
 ‘Vanja did not consider Ira a nobody.’ DN
 ‘Vanja did not consider Ira anybody’ NC

- (16) a. Krupnye predprijatija ne pojavljajutsja iz niotkuda.
 Large factories Neg appear from n-where
 b. ‘Large factories don’t come from nowhere.’ DN
 c. *‘Large factories don’t come from anywhere.’ *NC

⁴ The idea that restriction to identified entities can be seen as restriction on the quantifier was suggested by Jon Gajewski (p.c).

⁵ A potential alternative is analyzing Russian freestanding n-words as negative elements with a narrow scope. It faces a serious problem, though, because restricted distribution of freestanding n-words will remain unexplained.

Consider how this contrast is explained on Bošković (2004) and (2007) theory. It is well known that n-words cannot be licensed across a CP in Russian (17).

- (17) *Ivan ne veril, [CP čto Marija ljubit nikogo].
 Ivan NEG believed that Maria loves n-who
 ‘Ivan did not believe that Maria loves nobody.’

Under Bošković’s (2007) analysis, the same is happening in (16): PP^{CP}, being a CP, blocks the licensing of the n-word by the matrix SN⁶:

- (18) Krupnye predprijatija ne pojavljajutsja iz niotkuda.
 Large factories NEG appear from n-where
 [AGRSP ... [NEGP ne [TP ... [PP^{CP} ... [NEGP \emptyset_{Neg} [PREDP ... [PP iz niotkuda ... DN
 [AGRSP ... [NEGP ne [TP ... [PP^{CP} ... [PREDP ... [PP iz niotkuda ... *NC

In contrast to PP^{CP}s, SCs are smaller than CPs⁷, so no C-intervention effect takes place. The n-word in the small clause predicate can thus be licensed by the matrix negation or by \emptyset_{Neg}

⁶ The availability of NC and DN readings for sentences containing n-words as complements of P appears linked to whether or not the *ni* morpheme is separated by P from the wh-stem. The generalization can be formulated as a one-way implication (mainly because not all Russian n-words allow *ni*-movement): if in the presence of SN the order is *ni* + P+ wh-stem, NC readings are preferred. This effect is explained if *ni* moves to Spec, CP, obviating the C intervention effect. In this case, the n-word can be licensed by the matrix SN, as in (12) above repeated here as (i).

- (i) a. Ivan ne govorit gadostej ni pro kogo.
 Ivan Neg says bad things n about who
 ‘Ivan does not say bad things about anybody.’ NC, *DN
 b. [TP Ivan [NEGP ne govorit gadostej [CP ni_j [C pro_i [PREDP [PP t_j t_i kogo]]]]]]]

For a discussion of P+*ni*-wh-stem and *ni*+P+wh-stem order, see Billings (1997) and Harves (1998).

⁷ Given that the matrix verb exceptionally Case-marks the subject of the SC, the SC in fact cannot be a CP or this Case assignment would be blocked.

3 Accounting for the Restricted Distribution of \emptyset_{Neg}

The distribution of \emptyset_{Neg} is restricted – most notably, \emptyset_{Neg} is banned from tensed clauses (19).

- (19) Ivan *ne*/* \emptyset_{Neg} *poceloval* *nikogo*.
 Ivan Neg/Neg kissed n-who
 ‘Ivan did not kiss anyone.’

This observation correlates with an important empirical finding in Zanuttini (1996). Zanuttini shows for Romance languages that NegP can only occur in a sentence that has TP. The empirical generalization that there exists a one-way correlation between SN and tense appears robust cross-linguistically (Zeijlstra 2005, among others). I will refer to this relation as co-occurrence, without making a claim as to its exact nature.

The Russian SN head *ne* appears in a clause headed by a verb, including infinitives, subjunctives and imperatives. Imperatives and subjunctives have been analyzed as having a TP (Khomitsevich 2007, Jensen 2003). As for infinitives, Stowell (1982) and Martin (2001) propose that control but not ECM infinitives are specified for Tense. Brecht (1974) observed that Russian, unlike English, does not license infinitival complements with a lexical subject. This difference between English and Russian was discussed in Lasnik (1998), who states that ECM is blocked in Russian infinitivals. Based on this conclusion, I assume that Russian lacks ECM infinitives, so all Russian infinitives are specified for Tense. Given the above discussion, it is reasonable to conclude that Russian SN co-occurs with TP.

What about small clauses and PP^{CP}s? Small clauses have been argued by a number of authors not to have Tense (Chomsky 1981, among others). As for PP^{CP}s, according to Baker (2003), they are incompatible with Tense. Small clauses and PP^{CP}s are then the only two clause types in Russian that do not have TP. Small clauses and PP^{CP}s are also the only clauses in which freestanding n-words, hence \emptyset_{Neg} , are possible. It is, then, reasonable to conclude that the SN head *ne* co-occurs with TP, and \emptyset_{Neg} is the elsewhere case.

4 N-words Cross-linguistically: Some Contrasts Between Russian and Spanish

Herburger (2001) discusses three approaches to Spanish n-words: n-words are treated as inherently negative, inherently non-negative and, as Herburger herself argues, ambiguous between negative and non-negative. I will discuss one group of Spanish examples that appear to provide evidence for the n-words as negative or ambiguous elements approach⁸ and suggest that in these examples negative meaning comes from metalinguistic negation. If true, this conclusion will provide an argument for the approach that treats Spanish n-words as non-negative and advance our understanding of Spanish and Russian NC.

4.1 Negative Concord in Spanish

The following examples from Herburger (2001) illustrate the basic Spanish NC paradigm. Preverbal n-words do not co-occur with SN (20a), but post-verbal ones do so obligatorily (20b); a preverbal n-word licenses a postverbal n-word (20c). Brown (1999) captures this paradigm the same way she captures the Russian one, i.e. assuming that n-words themselves are not negative. Her account dovetails with Bošković's (2001)⁹ account of the distribution of SN *no* in Spanish. On Bošković's theory, Spanish SN is a phonologically null PF affix, and only n-words can serve as its host. If there is no n-word available, *no* is inserted as last resort.

- (20) a. Nadie vino.
 n-body came
 'Nobody came.'
- b. No vino nadie.
 Neg came n-body
 'Nobody came.'
- c. Nadie miraba a nadie.
 n-body looked at n-body
 'Nobody looked at anybody.'

⁸ There exists a vast body of research on Spanish n-words, and due to space limitations I cannot do it justice. The reader is referred to Herburger (2001) and references cited there.

⁹ See Martín-González (2002) for a very similar theory. The main difference is that the formal deficiency of *no* is syntactic, not phonological.

Nevertheless, Spanish is not Russian with a phonologically null PF affix SN. The following ambiguity is not attested in Russian and resists explanation in terms of Brown (1999), because for DN readings to arise, n-words have to be able to carry iF_{NEG} .

(21) Nadie miraba a nadie.

n-body looked at n-body

‘Nobody looked at anybody/ nobody.’ (according to my informants)

We thus face the following contrast: Russian n-words carry only uF_{NEG} , whereas Spanish n-words carry uF_{NEG} or iF_{NEG} (as argued in Herburger 2001). In this section, I pursue the hypothesis that Spanish n-words carry uF_{NEG} even on the DN reading in (21). The account is tentative at this point, but if true, it would advance our understanding of NC.

4.2 Metalinguistic negation signaled by intonation

I propose that the DN reading in (21) is due to MN – disagreeing with an entire utterance ‘on any grounds whatever’ (Horn 1989). In Spanish, MN is signaled by intonation, whereas in Russian in comparable situations MN is expressed overtly.

Since at least Herburger (2001), it has been known that to get a DN reading for (21), one needs a special intonation with emphasis on the n-word or SN. Alonso-Ovalle and Guerzoni (2004) investigate a similar case: Italian n-words in the context of denial. (22) is their example where a sentence with an n-word that would normally get the NC interpretation (22A), gets a DN interpretation (22B).

(22)A: Maria stara’ morendo di fame, non ha mangiato niente

Mary will be starving , Neg has eaten n-thing

all day

tutto il giorno.

NC

‘Mary is probably starving, she has not eaten anything all day.’

B: **Non ha mangiato NIENTE**, ha mangiato un panino! DN

Neg has eaten N-THING, she ate a sandwich

‘It is not correct that she didn’t eat anything: she ate

a sandwich!’

According to Alonso-Ovalle and Guerzoni's (2004), the DN interpretation of (22B) arises because the n-word in (22A) contributes a negative implicature, and (22B) disagrees with this implicature. (22B) is thus an instance of MN on top of the truth-conditional negation supplied by SN.

In the judgment of some of my Spanish consultants, one can convey MN of any sentence with the same emphatic intonation. There do not have to be n-words in this sentence, as the following example illustrates:

(23) A: (My Dad is very rich and does not have to work,
 pero cuando era joven trabajaba 18 horas al día.
 But when he.was young he.worked 18 hours a day
 '... but when he was young he worked 18 hours a day.'

B: Trabajaba 18 horas al día.
 He worked 18 hours a day
 '(Yeah, right) he worked 18 hours a day.'

Likewise, Spanish (21) can be used in two situations. In the first one, the intonation is neutral and the only reading is NC; in the second one, by using the emphatic intonation, speaker B rejects A's utterance (DN):

(24) Nadie miraba a nadie.
 n-body looked at n-body

Situation #1: You went to a party where all the guests were either Red Sox or Yankees fans. The fans insulted each other, felt ashamed and tried to avoid looking into other guests' eyes. On the next day, you tell your friend, 'It was not a good party. Nobody looked at anybody.'

Situation #2: You went to a party where guests played a game with their eyes blindfolded. They had to recognize each other by touching each other's face, without looking. You were surprised that everyone but you guessed right. Later, you (A) and your friend (B) have the following conversation:

A: Everybody guessed right, and nobody looked at anybody. (Nadie miraba a nadie.)

B: No way nobody looked at anybody! (Nadie miraba a **nadie**).

I suggest that MN is a property of C. It has been extensively argued that C affects the truth value of the clause (see, for ex. Progovac 2005 and references cited there). The emphatic intonation correlates with what I call non-affirmative $C_{\text{non-aff}}$, which, if its complement clause is negated, leads to a DN interpretation (25a). The C that corresponds to neutral intonation is the affirmative C_{aff} , and if its complement clause is negated, the interpretation is simple negation (25b). $C_{\text{non-aff}}$ in the Spanish and Italian cases above is signaled only by intonation - it is phonologically null and nothing moves to it.

- (25) a. [$CP C_{\text{non-aff}}$ [$NEGP...$ (n-word) Neg ...]]
 b. [$CP C_{\text{aff}}$ [$NEGP...$ (n-word) Neg ...]]

If this account is on the right track, it should be possible to embed the sentences in (20a,b) under $C_{\text{non-aff}}$ and get a DN reading. Indeed, (20b) can be used in situation (26) and receive a DN reading.

- (20b) No vino nadie. NC
 Neg came n-body

- (26) *Situation:* Your friend tells you that the anti-war demonstration got canceled because nobody came. You know that a number of people were definitely going there.
 You: (with the emphatic intonation) No vino nadie. DN

Russian has a number of expressions of MN. Russian examples (27), (28), (29) are parallel to (22), (23), (24) above. In all these cases, expressions of MN are overt, carry an emphatic intonation and have to be sentence-initial. They must be overt instances of $C_{\text{non-aff}}$.

- (27) A: Maša naverno s goloda umiraet, ona ves' den'
 Masha probably with hunger dies, she all day
 ničego ne ela. NC, *NC
 n-what Neg ate
 'Masha must be starving, she has not eaten anything all day.'
 B: Da nu/Da prjam/ Konečno ničego ne ela! A buterbrod? *NC, DN
 Are you kidding (no way)/surely n-what Neg ate! but sandwich?
 'No way she ate nothing! What about the sandwich?'

- (28) A: (My Dad is very rich and does not have to work,) Affirmative
 No v molodosti on rabotal po 18 časov v den'.
 But in youth he worked on 18 hours in day
 'But when he was young he worked 18 hours a day.'
- B: Čërta s dva on rabotal po 18 časov v den'! 'no way'
 Devil.with.two he worked on 18 hours a day
 'He worked 18 hours a day my ass!'
- (29) A: (Everyone's eyes were blindfolded and) NC, *DN
 Nikto ni na kogo ne smotrel.
 n-who n-on-who Neg looked
 'Nobody looked at anybody.'
- B: Da nu/Da prjam/Konečno/ Čërta s dva nikto
 Are you kidding (no way)/surely/ Devil.with.two n-who!
 ni na kogo ne smotrel! *NC, DN
 at n--who Neg looked
 'Nobody looked at anybody my ass!'

The contrast between Russian and Spanish summarized in the end of sub-section 4.1 may, then, reflect a difference in the expression of MN, not in the negativity of n-words. In Spanish, $C_{\text{non-aff}}$ is phonologically null, but in Russian it is filled by overt material.

5 Conclusion

I have established the empirical generalization that freestanding n-words occur in Russian in small clause predicates and as complements of Ps. To explain this generalization, I have argued that there are two negative heads in Russian, SN *ne* and \emptyset_{Neg} , and freestanding n-words are in fact licensed by \emptyset_{Neg} . I have also argued, following Zanuttini (1996), that the SN head *ne* co-occurs with TP, whereas \emptyset_{Neg} is the elsewhere case.

I have also proposed that the difference in negativity between Russian and Spanish n-words may be apparent. The real difference is the way MN is expressed in the two languages.

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Interface Constraints and Frequency in Russian Compound Stress*

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This paper has two goals. The first is to describe the patterns of secondary stress assignment in Russian compounds. Russian lexical stress is famously complex, and secondary stress in compounds reveals previously unnoticed properties of the system. An understanding of compound stress may resolve some debates in the analyses of Russian stress. Our second goal is to contribute to the study of how frequency interacts with phonological markedness. There is an oft-noted correlation between high frequency and relative phonological unmarkedness (Zipf 1949, Martin 2007, and others). Russian presents a correlation of a different variety: phonological markedness signals morphological complexity. Specifically, secondary stress, which is an anomalous feature for Russian words, is more likely to occur on low-frequency words, and we argue that its placement encodes morphological complexity. Low frequency requires a more robust indication of morphological complexity. We analyze the interaction between frequency and morphological complexity in Russian compound stress in terms of constraint indexation in Optimality Theory (Prince and Smolensky 2004). An analysis of Russian requires that indexation be available for morphological interface constraints, not just for faithfulness constraints (see also Flack 2007, Gouskova 2007, Pater 2008).

The paper is organized as follows. Section 1 overviews the morphology of Russian compounds. §2.1 provides a bit of background

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on Russian primary stress. §2.2 lays out the patterns of secondary stress in compounds that we found in our study. The phonological analysis is presented in §3. Finally, §4 concludes.

1 Morphology of compounds

1.1 *Kinds of Russian compounds*

Russian has three types of compounds: coordinating, truncated, and subordinating (Townsend 1975: 201-207, Molinsky 1973). Coordinating compounds consist of at least two whole words, with each bearing its own inflection: [gús-i-lébed-i] ‘geese_{NOM.PL} and swans_{NOM.PL}’.¹ Stress in these appears on each constituent. Truncated compounds consist of at least two bases truncated from the right, typically to one closed syllable. A single inflection for the whole compound appears on the rightmost stem: [kol-xóz] ‘collective farm’ (from [kolektívnoje] ‘collective’ and [xoz’ájstvo] ‘farm’), the company name [vněš-pròm-tèx-obmén] (from [vněšnij] ‘external’, [promýšlennyj] ‘industrial’, [texničeskij] ‘technical’, and [obmén] ‘exchange’). Stress in these appears on each stem, but in older, frequent compounds such as [kolxóz], there is only one stress, on the rightmost stem. In subordinating compounds, which are our primary focus, stems are combined with a theme vowel (orthographic *-e* - or *-o-*, similar to Greek (Nespor and Ralli 1996)): [oboròn-o-sposóbnost’] ‘defense capability’ (from [oborón-a] ‘defense’ and [sposóbnost’] ‘capability’). The morphological head is the rightmost stem, which also bears the inflection for the whole compound. The rightmost stem is always stressed, which we attribute to a requirement for morphological heads to be stressed (Revithiadou 1999: 28). This requirement is never violated in compounds. The presence of secondary stress on the first stem depends on complex conditions (discussed in §2.2). The generalizations concerning stress and frequency seem to apply both to truncated and subordinating compounds. Our analysis accounts for both.

¹ We use a fairly broad transcription: stress is transcribed throughout (primary as an acute [á], and secondary as a grave [à]), but we do not systematically mark vowel reduction, devoicing, or palatalization.

1.2 Morphological and prosodic structure

Our assumptions about the morphological and prosodic structure of Russian compounds are as follows. Morphosyntactically, coordinating compounds consist of separate syntactic words, and prosodically, they are concatenations of prosodic words (ω) into a phonological phrase (Φ), as in $[\{g\acute{u}si\}_\omega \{l\acute{e}bedi\}_\omega]_\Phi$. In subordinating and truncated compounds, on the other hand, the stems are combined into a single syntactic word, which contains at least two stems and a linker morpheme. Phonologically, therefore, these compounds constitute single, non-recursive prosodic words, though some of them may have more than one foot: the name of the film studio $\{(m\acute{o}s)_{Ft} (fil'm)_{Ft}\}_\omega$ (cf. [moskvá] ‘Moscow’ and [fil'm] ‘film’) and $\{go.lo(vo.lóm)_{Ft}ka\}_\omega$ ‘puzzle’ (cf. [golová] ‘head’ and [lomátj] ‘to break’).

- (1) Morphological and prosodic structures for Russian truncated and subordinating compounds

<p>a. Truncated compounds</p>	<p>b. Subordinating compounds</p>

We assume that the theme vowel *-e/-o-* forms a morphological constituent with the left-hand stem. Phonologically, this vowel is clearly syllabified with the last consonant of the left-hand stem: root-final consonants retain a voicing contrast in left-hand compound stems (/goloy-o-lom-k-a/ → [go.lo.vo.lom.ka], not *[go.lof.o...] ‘puzzle’). Since Russian has devoicing at the ends of prosodic words, the consonant is not prosodic-word-final. The theme vowel is also not prosodic-word-final

based on reduction patterns.² The morphological affiliation of the vowel is harder to determine: we are not aware of morphosyntactic evidence that points either way in Russian (though Krott et al. 2001 find that the left-hand stem has a greater effect than the right-hand stem on the choice of linking element in Dutch compounds). Some work on Greek linking vowels makes the same assumption, though others assume that the vowel is epenthetic and not morphological (see Ralli (2003) for an overview). The epenthetic analysis does not seem appropriate for Russian, since the theme vowel sometimes appears in hiatus contexts (see (2)).

With this background on the morphology of Russian compounds, we now move on to the phonology of stress.

2 Secondary stress in Russian compounds

2.1 Background on main stress placement

Russian stress is lexically contrastive, and its position cannot be predicted from the phonological shape of the word. It is also strongly culminative: in single-root words, there is only one main stress, regardless of the number of syllables: e.g., [v'ý-kristal-iz-ova-t's'ja] 'to crystallize.' Compounds present the only robust context for secondary

² We ascertained that the theme vowel *-o-* reduces to [ə] when it is not pretonic but to [ʌ] in pretonic position. The reduction pattern in pretonic position would indicate that the vowel is footed into an iamb with the following stressed syllable (Crosswhite 1999): if there were a prosodic word boundary separating the two syllables, we would expect the vowel to reduce to schwa. Alternatively, the pretonic vowel could have different quality due to tone spreading from the stressed syllable (Bethin 2006), but there is still no evidence that there is a strong prosodic boundary between the theme vowel and the following stem. In true word-final positions (e.g., oborón[ə] góroda 'defense of the city'), vowel reduction does not seem to depend on where the stress falls in the following word, but this is something that should be investigated further.

stress.³ Main stress in compounds always falls on the last stem, and its position is determined by the accentual properties of the root and affixes (see Roon 2006). To understand how secondary stress is assigned, we have to present some background on main stress placement, since the lexical subclass of the first compound stem determines to some extent whether it will bear secondary stress.

As reported by Zaliznjak (1977), a majority (~92%) of nominal stems in Russian have fixed stress on some syllable of the stem throughout the inflectional paradigm (Pattern A, [tetrád'-Ø]~[tetrád-i] 'notebook_{NOM.SG~GEN/DAT/LOC.SG}'). About 6% of stems have stress on the inflectional suffix, and if there is no overt suffix, on the last syllable of the stem (Pattern B, [čért-á]~[čért-Ø] 'feature_{NOM.SG~GEN.PL}'). The remainder (about 2%) of the stems have mobile stress, which alternates between inflection stress and either initial (Pattern C, [kólokol]~[kolokol-á] 'bell_{NOM.SG~NOM.PL}') or stem-final stress (Pattern D, [kolbas-á]~[kolbás-y] 'sausage_{NOM.SG~NOM.PL}').⁴

In analyses of Russian stress (Halle 1973, Halle and Vergnaud 1987, Melvold 1990, Idsardi 1992, Halle 1996, Alderete 1999), three positions compete for default status: initial, post-stem, and final or desinence. There is no consensus in the literature as to the default (see Crosswhite et al. 2003)—all analyses have to appeal to lexical exceptions, suggesting that no one generalization can be made over the entire system. Regardless of what default is posited, every analysis treats stems with fixed stress on the 2nd or 3rd syllable as underlyingly accented, so we will take this to be the strongest generalization emerging from the literature. We will also assume that all Pattern A stems have underlying stress, and that Patterns B, C, and D do not.

³ The other context for secondary stress is certain foreign prefixes (*súper-*, *psévdo-*, *óper-*). We analyze these as lexical exceptions to the "one-stress-per-word" generalization (see §3): these are lexically accented prefixes whose accents cannot be deleted even if this means that the word ends up with two stresses. Alternatively, one could posit that these are stems (or roots) in their own right, as Peperkamp (1997) does for Italian. We would like to avoid this route, since there is no evidence that these morphemes have root status—for one thing, they cannot head words of their own. Positing that they are stems based on stress alone amounts to circularity. Our analysis does not explain, however, why prefixes but not suffixes can bear secondary stress.

⁴ In subsequent examples, we indicate the stress patterns of stems with subscripts A-D.

2.2 Secondary stress

Existing descriptions of secondary stress in Russian compounds (Avanesov 1964, Yoo 1992, Kuznetsova 2006) rely on the intuitions of individual native speakers, and since the patterns are variable and involve some optionality, the works do not always transcribe secondary stress consistently. We investigated them more systematically in a production study. Three native Russian speakers from Moscow read a list of 144 compounds. Each speaker read the list twice. The words were placed in the frame *napísano* ____ *p'át' ráz* 'X is written five times', chosen to avoid potential stress clash effects on the left-hand side. The words were transcribed for the presence of secondary stress by both authors, who consulted in cases of disagreement. The generalizations we extracted from the data are summarized below.

Normally, two requirements must be met for secondary stress to appear. First, the left-hand stem must have fixed stress (Pattern A, as described in §2.1). Second, there must be at least two unstressed syllables between the syllables bearing primary and secondary stress. As shown in (2a), secondary stress does not surface if the syllables are too close to each other.

(2) Patterns of secondary stress in Russian compounds

a. No secondary stress: one syllable would separate stresses

kanat-o-xódets	'tightrope walker'	kanát _A	'tightrope'
ver-o-lómstvo	'treachery'	vér-a _A	'faith'

b. Secondary stress: two syllables separate stresses

vèr-o-ispovedánije	'denomination'	vér-a _A	'faith'
oboròn-o-sposóbnost' ^l	'defense capability'	oborón-a _A	'defense'
bòmb-o-ubéžišče	'bomb shelter'	bómb-a _A	'bomb'

Secondary stress normally does not appear on Pattern B and Pattern C stems even if there is enough room for two unstressed syllables to separate the stresses:

(3) Pattern B and C stems do not have secondary stress

golov-o-kružénije	'vertigo'	cf. golov-ác	'head'
ogn-e-tušítel' ^l	'fire extinguisher'	cf. ogón' _B	'fire'
korabl-e-kružénije	'shipwreck'	cf. koráb' _B	'ship'

There are exceptions to the rhythmic generalization (as noted also by Avanesov 1964, Yoo 1992). In low-frequency words, secondary stress may appear even when there is only one syllable separating the stresses (see (4)). Crucially, in many of these low-frequency words, secondary stress surfaces in a position that does not correspond to an underlying accent. For example, none of the analyses of Russian stress assume that [jestestv-ó] ‘nature’ is underlyingly stressed on the second syllable.

(4) Low-frequency stems get secondary stress

jestèstv-o-védenije ‘natural science’ cf. jestestv-ó_B ‘nature’
 kukurúz-o-vód ‘maize grower’ cf. kukurúz-a_A ‘maize, corn’

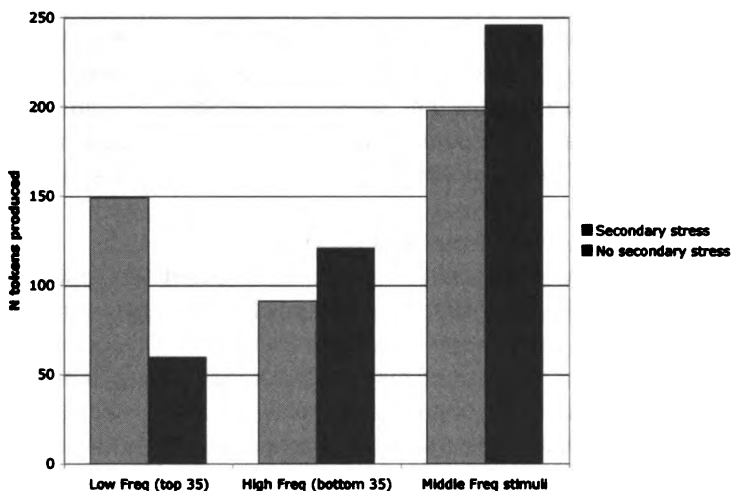
Moreover, secondary stress may even surface in a syllable *adjacent* to primary stress: in compounds with vowelless (yer) stems, the theme vowel bears secondary stress (see (5)). Compounds with ‘linen’ and ‘ice’ tend to be infrequent words, so it is impossible to tell *a priori* whether these compounds have secondary stress because of low frequency or for another reason, for example because they contain relatively marked consonant clusters. We are currently investigating this question in a follow-up study.

(5) Yer stems get stress

ʲd-ò-búr ‘ice breaker’ cf. ʲód_B ‘ice’
 ʲn-ò-zavód ‘linen factory’ cf. ʲón_B ‘linen’

The effect of frequency on secondary stress realization is shown in Figure 1 for the 150 compounds we recorded. Each stimulus compound was classified according to its frequency in the Russian-language search

Figure 1: Effect of frequency on secondary stress realization



engine Yandex (<http://yandex.ru>).⁵ High frequency words were the 35 most frequent stimuli, low frequency words were the 35 least frequent, and the rest were classified as middle frequency.

As shown in the graph, the patterns of secondary stress realization are more or less the same in the high and middle frequency compounds, but they are reversed in the low frequency compounds.

3 Analysis

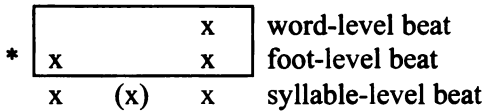
We assume that by default, compounds have two prominences—one for each root-based stem. Rhythmic and faithfulness constraints may override this default, so not all compounds will surface with secondary stress. For low-frequency words, however, the requirement for each stem to have a prominence is ranked higher, so it overrides the rhythmic and faithfulness constraints. This pattern arises through the interaction of the

⁵ Yandex includes inflected forms of each compound in the total number of hits, whereas Google treats case forms such as *golovolomk-a* and *golovolomk-i* as different words.

following constraints.⁶ In (6), we define an interface constraint *STEM*→*PROM*, which requires each morphological stem to contain at least one segment that projects a phonological prominence (cf. Alderete’s 1999 *POST-STEM-PROM*, also Revithiadou 1999). Since stems are often nested inside each other, the constraint must apply at the level of the maximal projection for each stem. This constraint conflicts with markedness constraints on rhythm (see (7)). These include a modified anti-clash constraint **STRONGCLASH* (following Nespor and Vogel 1989; cf. **FTFT* of Kager 1994) and some constraints whose interaction favors words with just one prominence, including *ENDRULE-L*. *ENDRULE-R* is never violated in Russian, since the main stress is always the rightmost and usually the only stress in the word.

- (6) Morphology-phonology interface constraint
STEM→*PROM* (*ST*→*PR*): “For each stem, some segment affiliated with the stem projects a prominence on the grid.”
(One instantiation, STEM→*PROM_L*, indexed to low-frequency words; the other applies to all.)

- (7) Prosodic markedness constraints
 - a. **STRONGCLASH* (**S-CLASH*): “assign a violation mark for every pair of adjacent columns of strong beats”



- b. *ENDRULE-L* (*ER-L*): “A word-level prominence is not preceded by another prominence at the word level.” (after Prince 1983; see also McCarthy 2003)

Finally, faithfulness is also active in the pattern. We adopt Alderete’s (1999) accentual faithfulness, defined informally as follows.

⁶ We assume a bracketed grid representation for stress (Hayes 1995). We also assume that Headedness “a PrWd dominates a Foot” is not violated, so each word has to have at least one stress.

(8) Faithfulness to accent

MAX(Accent): “No deletion of accent”

DEP(Accent): “No insertion of accent”

NOFLOP(Accent): “No movement of accent”

We start with the phonology of normal compounds. These compounds are by default required to have two stresses—unlike non-compounds, which can only surface with one stress even if more than one morpheme is accented underlyingly. This is because ENDRULE-L dominates MAX, requiring that the main stress be the only stress in non-compounds. STEM→PROM in turn dominates ENDRULE-L, and so two stresses surface in compounds:⁷

Tableau 1: Compounds project two prominences, whereas non-compounds project one

/vý-, kristál _A , -iz-, -ova-, -t ^l -, -s ^l a/	ST→PR	ER-L	MAX
a. σ výkristalizovat ^l s ^l a			*
b. v ^l ykristalizovat ^l s ^l a		*!W	L
/rabót _A -, -o-, sposób-, nost ^l /			
c. σ rabót-o-sposóbnost ^l		*	
d. rabót-o-sposóbnost ^l	*!W	L	*W

ST→PR will be violated when the underlying position of the stress on the left-hand stem is too close to the main stress. This would violate *STRONG-CLASH, so stress must be deleted in such words:

Tableau 2: Compounds normally do not have stress clashes; underlying accent is deleted to avoid clash

/rabót _A -, -o-, dat-, e ^l /	*S-CLASH	ST→PR	ER-L	MAX
a. σ rabót-o-dáte ^l		*		*
b. rabót-o-dáte ^l	*!W	L	*W	L

An underlying stress could in principle be realized somewhere other than its underlying location, but this option is ruled out by an

⁷ We use comparative tableaux (Prince 2000). Readers not familiar with this format should ignore “W” and “L.”

undominated NOFLOP(Accent).

Thus far, we have accounted for Pattern A stems, which we assume have underlying stress. For roots that lack underlying stress, ST→PR cannot be satisfied by inserting stress. This suggests that DEP(Accent) dominates ST→PR:

Tableau 3: Stress cannot be inserted on underlyingly unaccented stems

/golov _C -, -o-, kruž-, énije/	DEP	ST→PR
a. σ golov-o-kružénije		*
b. golòv-o-kružénije	*!W	L

We now turn to low-frequency compounds, which satisfy ST→PR for each stem even if it means inserting stress and violating rhythm. ST→PR is doubly instantiated in the hierarchy, and the higher-ranked indexed STEM→PROM_L applies to low-frequency compounds.

This constraint is ranked above DEP(Accent), so an accent must be inserted even if one is not present underlyingly:

Tableau 4: Low-frequency stems have prominence, even if it is inserted

/jestestv _B -, -o-, ispytánije/ _L	ST→PR _L	DEP
a. σ jestèstv-o-ispytánije		*
b. jestestv-o-ispytánije	*!W	L

Under this analysis, even stems containing vowelless roots should have stress, which is placed on the only available syllable: the one with the theme vowel as its nucleus (recall from §1 that we take the theme vowel to be part of the first stem). This placement of accent violates both DEP(Accent) and *STRONG-CLASH:

Tableau 5: Theme vowel may be stressed in low-frequency compounds

/ʃd _B -, o-, bur/ _{LEX}	ST→PR _L	DEP	*S-CLASH
a. σ ʃd-ò-búr		*	*
b. ʃd-o-búr	*!W	L	L

Forms such as [ʃdòbúr] and [jestèstvoispytánije] present essential evidence for our argument that this pattern is driven by a morpho-phonological interface constraint rather than by indexed faithfulness.

Since these forms lack stress underlyingly, their stress patterns cannot be due to the promotion of MAX(Accent) to the top of the hierarchy. These forms violate faithfulness in order to satisfy the interface constraint.

Although we have been talking about this pattern in terms of indexation to frequency, we believe this is a proxy for a more abstract distinction. The grammar provides two different instantiations of the constraint in the hierarchy, but whether the relevant property is low frequency or formal register may be determined outside the grammar proper. It may even be that the indexation is quite arbitrary. This would explain forms such as [zèml-e-délets] ‘farmer’ (from [zemlʲ-á]_C ‘earth’ and *del-* ‘to do, make’), which unexpectedly surface with secondary stress in violation of both DEP(Accent) and *STRONG-CLASH. These pattern with low-frequency compounds—an option made available by generic indexation. The prediction of this analysis is that accent can be inserted on such stems, but it will not be deleted on Pattern A stems.

Finally, our analysis has nothing to say about the location of inserted secondary stress. Why, for example, is [jestéstv-o-ispytánije] stressed on the second syllable and not on the first? There are many possible explanations for this, which we cannot treat fully here, but we mention a few. One possibility is that the same principles are at work here as elsewhere in the language: in the genitive plural and in derived affixed forms (e.g., [jestéstvenno] ‘naturally’), the stress in this stem is on the last syllable, just as in the compound. Another possibility is that stress placement is determined by some related output form, which serves as a transderivational correspondence base for the compound (Benua 1997). This seems initially plausible for some forms, but even a cursory look at the left-hand stems suggests that the choice of base is not a simple matter. It is also possible that some of the mobile stress stems (Patterns B, C, and D) actually have underlying stress, which the grammar treats differently from Pattern A stress.

4 Conclusion

Russian compound stress is sensitive to two factors. First, a left constituent will surface with secondary stress if it is underlyingly accented and secondary stress does not create a stress clash. Second, low-frequency compounds are more likely to surface with secondary stress than higher-frequency compounds. We have accounted for this by

proposing a morpho-phonological constraint requiring each morphological stem to project a prominence on the metrical grid. This constraint is indexed to low-frequency compounds. Its ranking above rhythmic and faithfulness constraints requires low-frequency compounds to have secondary stress even if they are underlyingly unaccented or if there is a stress clash. Secondary stress thus encodes morphological complexity in Russian compounds.

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Null Prepositional Complementizers and the Dative of Obligation in Russian*

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This paper investigates the argument structure and case-marking mechanism in the Russian dative-infinitive deontic modal construction (henceforth DIM), consisting of a dative argument, an auxiliary *be*, and an infinitive, as exemplified in (1).¹

- (1) Gde nam e/bylo spat'?'²
where US_{DAT} be_{(PRST)/PST.N.SG} sleep_{INF}
'Where do/did we have to sleep?'

The discussion of the syntactic organization of the DIM construction has mainly focused on (i) the subject-status of the dative argument; (ii) the thematic structure in the context of raising and control; and (iii) the licensing of the dative of obligation (Greenberg and Franks 1991, Kondrashova 1994, Franks 1995, Komar 1999, Moore and Perlmutter 2000, Sigurdsson 2002, Fleisher 2006, among others). This paper

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¹ Gilbert Rappaport and an anonymous FASL reviewer pointed out to me that the DIM often has the epistemic semantics, in particular, under negation (see Section 1.2). While having no objection to this point, I nevertheless maintain the label "deontic" in this paper, as long as the construction *may* represent deontic modality. One aim of this paper is to show that the DIM construction *with* a deontic reading contains a raising structure. For this purpose, sentences that can (but not necessarily exclusively) denote deontic modality have been carefully selected for inclusion.

² All my informants (13 out of 13) rejected the DIM with the overt future tense copula *budet* while most of them (11 out of 13) accepted the past tense copula *bylo*.

addresses the last two questions. Assuming a bi-clausal structure for the DIM construction (*à la* Sigursson 2002, Fleisher 2006), I argue for an ECM (Exceptional Case Marking) analysis of this construction and propose an underlying structure, in which the dative argument is licensed by an embedded null prepositional complementizer.³⁴ The proposed structure, motivated by the cross-linguistic parallel between possessive and obligation constructions, not only accounts for apparent control properties of this construction but also shows how infinitival datives in Russian are licensed in general.

1 The argument structure of DIM sentences

A crucial question regarding the argument structure of the DIM sentence is whether this construction contains two thematic roles (control structure) or only one role (raising structure). Deontic modality has been thought to involve either a control structure, containing an experiencer argument in addition to the argument from the embedded infinitive (Ross 1969, Zubizarreta 1982, Roberts 1985, among others) or a raising structure only with the argument originating from the infinitive (Bhatt 1997, Wurmbrand 1999, and others). It has also been proposed that deontic modality involves both control and raising (Brennan 1993). For the DIM construction in Russian, a control structure has often been

³ Moore and Perlmutter (1999, 2000) identify the DIM construction as mono-clausal and construe the overt auxiliary *bylo* ‘was’ as a “temporal particle”. However, the notion of “temporal particle” is neither independently justified in the DIM nor elsewhere in Russian. As Sigurdsson (2002) correctly points out, the morphological pattern of *byt’* ‘be’ in the DIM sentence conforms to that in Russian copular sentences without a nominative argument (covert in the present tense and neuter singular in the past). In addition, Fleisher (2006) argues that the location of negation, limited to the post-copula position as in (i), shows that the tense auxiliary is located outside the infinitival clause.

- (i) Gruzovikam *ne bylo ne proexat’.
 Truck_{DAT} NEG be_{PST} NEG pass-by_{INF}.
 ‘It was not for trucks to pass-by.’

⁴ I assume that ECM is a subtype of raising, in that ECM involves only one thematic argument and one case. The only difference between ECM and raising is the locus of case marking.

posited (e.g. Sigurdsson 2002, Fleisher 2006). However, the Russian DIM sentence actually shows both control and raising properties.

1.1 Control analysis

Fleisher (2006) argues that the DIM construction in Russian is a control structure, as represented in (2), on the basis of the incompatibility of a null expletive subject with this sentence, as shown in (3a-b).

(2) [TP Subj_{DAT} T ... [TP_{non-finite} PRO_i T [_{vP} t_i v [VP]]]]

- (3) a. Menja tošnit.
 me_{ACC} sicken_{3.SG}
 ‘I feel nauseous.’
 b. *Menja tošnit’.
 me_{ACC} sicken_{INF}
 Intended: ‘It is for me to feel nauseous.’

In (3a) what causes the experiencer to feel nauseated is not given, and therefore the verb *tošnit* ‘sicken’ appears in a default 3rd person singular form. It may be posited that a null expletive occupies the subject position. As shown in (3b), the impersonal sentence in (3a) cannot be transformed into a DIM construction. Fleisher argues that the ungrammaticality of a null expletive subject in (3b) indicates the presence of a covert thematic argument, i.e., PRO, as represented in (4).

(4) *Menja_i (expl_j) [PRO_j tošnit’ t_i].

Another syntactic peculiarity pertaining to the syntactic structure of the DIM construction is that the dative argument cannot be embedded as PRO under a control verb, such as *xotet* ‘want’, as illustrated in (5a-b).

- (5) a. Teper’ mne e ujti?
 now me_{DAT} (be_{PRST}) leave_{INF}
 ‘Now do I have to leave?’
 b. *Ja_i ne xoču [PRO_i byt’ ujti/uxodit’]
 I_{NOM} NEG want_{PRST} be_{INF} leave_{INF}
 Intended: ‘I don’t want to have to leave.’

The dative argument's inability to be embedded as PRO may indicate the non-subject status of this constituent (Sigurdsson 2002, Fleisher 2006). When a subject-to-subject movement is assumed for a raising operation, the non-subject status of the dative argument would lend indirect support to the control analysis: If the DIM involves raising, it is unclear how a base-generated subject could raise to and be case-marked in a non-subject position, based on the recent minimalist assumption that a Case feature does not motivate movement (Chomsky 2000).⁵ Alternatively, if the dative argument merges, for instance, as an applicative that controls PRO preceding the infinitive, the unembeddability of the dative argument as PRO is naturally accounted for.⁶

1.2 Raising analysis

Despite the arguments supporting the control analysis above, the Russian DIM sentence also assumes typical raising properties. First, the embedded verb may be passivized without causing changes in the arguments' semantic roles. The embedded infinitive *opublikovat'* 'publish' in (6) is passivized in (7).

- (6) Počemu že nam ne opublikovat' etu stat'ju zdes'?'
 why Prtcl u_{DAT} NEG publish_{INF} this article_{ACC} here
 a. 'Why shouldn't we publish this article here?' *deontic*
 b. 'Why can't we publish this article here?' *epistemic*

⁵ Jakab (2001) proposes that the dative case is licensed to a raised external argument by a complex head [Mod + Infinitive]. I reject Jakab's argument since it is unclear why another raising modal adjectival predicate *dolžn-* has a nominative subject, as shown in (i), given that this predicate also selects an infinitival clause as its complement.

- (i) Eta rabota dolžna byt' zakončena segodnja.
 this work_{NOM.F.SG} must_{F.SG} be_{INF} finished_{PART.F.SG} today
 'This work must be finished today.'

⁶ I reserve a definitive remark on the exact position of the dative argument in this construction. While assuming some subject properties such as subject-oriented reflexive binding, the dative argument does not pass other subjecthood tests such as being embedded as PRO, raising, etc., as discussed by Sigurdsson (2002). I speculate that this might be accounted for by assuming different types of subject positions, e.g., Logical Phrase (LP), as suggested by Williams (2006). The underlying structure put forward in Section 2.2 is indifferent on this issue.

- (7) Počemu že etoj stat'je ne byt' opublikovanoj zdes'?
- why Prtcl this article_{DAT} NEG be_{INF} published_{PART} here
- a. 'Why shouldn't this article be published here?' *deontic*
- b. 'Why can't this article be published here?' *epistemic*

Four of my thirteen informants considered both (6) and (7) to essentially have the same deontic meaning. Another four informants accepted the deontic reading for (6) but preferred the epistemic reading for (7). Two considered that both (6) and (7) are epistemic. The remaining three reported that both (6) and (7) are ambiguous between the two readings, although the sentences describe the same situation.

This variation is not surprising. As Fleisher (2006) notes, the sense of inevitability closely linked to the obligation semantics (also see van der Auwera and Plungian 1998 and references therein). The lack of overt modal predicates in the DIM could also facilitate this semantic flexibility. If we assume a raising structure with a single thematic role for the DIM construction with the deontic reading, the ambiguity of (6) and (7) between the two readings can be easily accounted for, since the epistemic semantics always involves a raising structure. Alternatively, if the DIM involved two thematic roles under a deontic reading, the ambiguity of (6) and (7) would not have arisen since passivization would clearly distinguish the epistemic and deontic semantics by associating different thematic structures with them.

Second, the dative argument is not necessarily the bearer of obligation. In (7) the dative argument *etoj stat'je* 'this article' cannot be the bearer of obligation. The bearer of obligation may be either designated by an instrumental phrase or simply implied by the context. This shows that there is no syntactically projected experiencer argument besides the argument that originates from the embedded infinitive.

Finally, the narrow scope reading of the dative argument in (8) indicates the raising structure in this sentence.

- (8) Začem dvum rossijskim sportsmenam ešče pobeždat' zavtra,
 why two Russian players_{DAT} also win_{INF} tomorrow
 esli sbornaja vse ravno vyigraet čempionat.
 if picked (team) anyway win championship
 a. (#) 'There are two Russian players. Why do they also have to
 win tomorrow if the national team wins the championship
 anyway?' 2 > be
 b. 'Why do any two Russian players also have to win
 tomorrow if the national team wins the championship
 anyway?' be > 2

Wurmbrand (1999), following May (1977, 1985), argues that only raising constructions allow the subject to take a narrow scope. The interpretation of (8) is ambiguous between the marginal wide scope reading in (a) and the narrow scope reading in (b).⁷ If sentence (8) contained a control structure, the narrow scope reading in (b) would be impossible, contrary to the fact.

In light of (6-8), the DIM construction appears as a raising structure.

2 Null prepositional complementizers

2.1 Distributional constraint of PRO and null expletives

Given the conflicting control and raising properties of the DIM, as illustrated above, it should be noted that the aforementioned control properties are reduced to a single distributional property of null expletives and PRO in Russian, namely, an exclusion from an overt Case position. The exclusion of PRO from this position is illustrated by (9a-b):

- (9) a. Ja sčitaju [sc Ivana umnym].
 I_{NOM} consider Ivan_{ACC} wise_{INST.M.SG}
 'I consider Ivan wise.'

⁷ An anonymous FASL reviewers pointed out that it is very difficult to distinguish the specific indefinite reading (a) from the definite one since Russian lacks articles. However, crucial to the diagnosis of a raising structure is the availability of the non-specific indefinite reading in (b), which most of the informants agreed on.

b.*Ja sčitaju [sc PRO umnym].

In (9a), a small clause includes an overt NP, case-marked by the immediately c-commanding verb. PRO is excluded from this position, as shown in (9b). The ungrammaticality of a PRO subject in (5b) may also be due to overt Case and not the non-subject status of the dative argument.

The ungrammaticality of null expletives in the DIM can also be accounted for in the same manner. Let us compare (10) to (9a) and (9b).

(10) *Ja sčitaju [sc *expl* xolodno/xolodnym].
 I_{NOM} consider cold_{NOM/INST.N.SG}
 'I consider it cold.'

(10) contains a small clause with a null expletive. The ungrammaticality of (10) shows that a null expletive, just like PRO, cannot appear in an overt Case position in Russian.

To summarize, the ungrammaticality of PRO and null expletive subjects may derive from the same condition: Neither PRO nor null expletives can appear in an overt Case position. In the next sections, I will propose an underlying structure for the DIM construction, which provides this environment.

2.2 Proposal of the underlying structure

2.2.1 Parallel between possessive and obligation constructions

My proposal of the structure of the DIM construction is crucially based on the structural parallel between possessive and obligation constructions, which has been widely recognized in the literature. As illustrated in (11-12), in *be*-possessive languages such as Russian and Hindi both possessive and obligation sentences consist of an oblique argument and the verb *be*.

(11) Hindi: Bhatt 1997
 a. John-ko sirdard hai.
 John_{DAT} headache be_{PRST}
 'John has a headache.'

b. John-ko seb khaa-naa hai
 John_{DAT} apple eat_{GER} be_{PRST}
 ‘John has to eat the apple.’

(12) Russian

a. U menja byla kniga.
 at me_{GEN} be_{PST.F.SG} book_{NOM.F.SG}
 ‘I had a book.’

b. Kuda mne bylo ujti?
 where me_{DAT} be_{PST.N.SG} leave_{INF}
 ‘Where did I have to leave for?’

The same type of parallel is also seen in *have*-possessive languages (e.g. Eng. *I have a book* vs. *I have to read a book*). This parallel is also seen between possessive and perfect constructions. The perfect construction often appears as an extension of the possessive construction (e.g. Eng. *I have read a book* vs. *I have a book*). On the basis of Freeze’s proposal on the derivation of possessives as a kind of existentials involving *be* and preposition (1992), Kayne (1993) and Bhatt (1997) formalize the parallel between the possessive and the perfect/obligation constructions, as illustrated in (13a-b).⁸

- (13) a. Possessive. [TP T [BEP BE [DP P [_{NP} Subj [*n* NP]]]]]
 b. Perfect/obligation. [TP T [BEP BE [DP/CP P [_{VP} Subj [*v* VP]]]]]

In (13a-b) the possessive and perfect/obligation constructions appear in a parametric variation in terms of the nature of the embedded clause. While the possessive embeds a purely nominal DP, in the perfect construction a mixed structure DP is embedded. The obligation construction embeds a verbal projection CP. The DP and CP projections

⁸ Some notational adaptations in (13) are mine. I changed AgrP in the original structures to *nP/vP* in (13). I also modified Bhatt’s obligation structure so that BE may embed a CP and not a DP since the Russian DIM sentence contains an infinitive. In Hindi modal construction (11b), the non-finite morphology *-naa* is construed either as infinitival (Mahajan 1990) or as gerundive (Bhatt 1997).

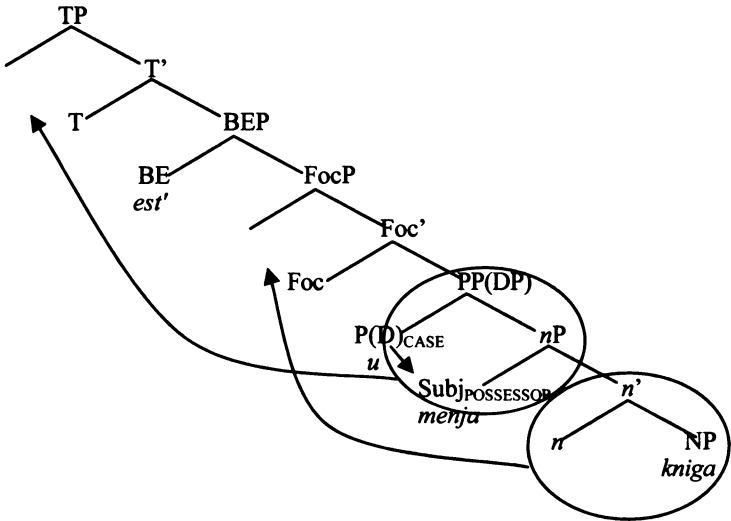
are headed by prepositions, responsible for the oblique case on the subject.⁹

2.2.2 Null prepositional complementizers as the source of the dative of obligation

In order to account for the derivation of Russian possessive and obligation constructions, I make some adaptations to the structures of Kayne (1993) and Bhatt (1997) in terms of case-licensing mechanism, as illustrated in (14a-b).

(14) a. Possessive

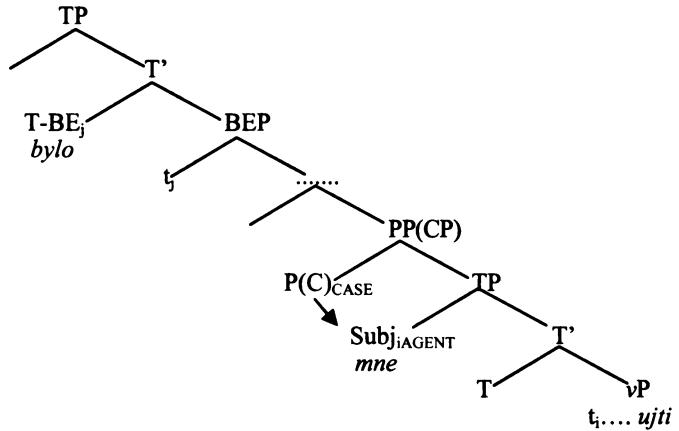
U menja est' kniga.
 at me_{GEN} be_{PRST} book_{NOM}
 'I have a book.'



⁹ A similar proposal of the possessive structure, in which the preposition is the source of the Case of the possessor, is found in Harley (1995). However, the structure in (13a) is distinct from Harley's (1995: 112) in that the possessor is base-generated as an external argument. Harley construes the possessor as an internal argument. See fn 10 for a related discussion.

b. Deontic Modal

Kuda mne bylo ujti?
 where me_{DAT} be_{PST} leave_{INF}
 ‘Where did I have to leave for?’



Let us first consider the possessive structure in (14a). The possessor is base-generated as the external argument in the embedded DP while the possessed NP is the predicate.¹⁰ In Kayne 1993 and Bhatt 1997, the

¹⁰ This argument structure conforms to the proposals of Kayne (1993) and Bhatt (1997) and differs from that of Freeze (1992) who posits a single underlying structure for existential, possessive, and locative constructions, in which the theme NP c-commands the location/possessor.

Harley’s proposal on the syntax of existential, locative, and possessive constructions in Tagalog (1995:120-123) has bearing on the analysis of the argument structure of the Russian possessive construction. Harley distinguishes languages based on whether the possessive construction patterns with the locative, in which the theme NP c-commands the location. In Tagalog, existential and locative constructions differ in terms of the type of copula and the order of the theme NP and the location. Tagalog possessives pattern either with locatives or existentials, depending on the specificity of the possessee. Assuming that the specificity restriction forces this variation, Harley concludes that the Tagalog possessive has the same underlying structure as the locative.

Russian, at first glance, seems very similar to Tagalog, having different copula types (*est’* vs. zero) and word order (location-theme vs. theme-location) in existential and locative sentences. The copula in the possessive construction is either overt (*est’*) or covert, depending on the specificity/definiteness of the possessee. However, the Russian possessive construction, in a neutral discourse, shows the same word order as the

embedded subject moves to Spec,PP, is marked with an oblique case by P, and further moves to the Spec of the matrix TP for EPP. I posit instead that the Case feature of the possessor is valued in situ by the c-commanding P, which is empirically justified by the overt PP (*u* 'at' + GEN). In Russian, narrow focus is fixed in the sentence-final position, which is syntactically mapped as a low focus phrase, similarly to Belletti's proposal of IP-internal focus in Italian (1999, 2001, 2004).¹¹ In the possessive construction in (14a) the possessed NP is attracted by low focus since it is new information. After the possessed NP moves to Spec,FocP, the PP including the possessor undergoes remnant movement to Spec,TP (or Spec,LP in Williams' sense (2006)). The possessed NP in Spec,FocP agrees with Tense and has its Case valued by Tense.

This analysis is entirely applicable to the DIM construction. In (14b) the embedded clause is an infinitival CP with a null prepositional complementizer. The external argument is base-generated in the Spec,vP of the embedded CP and subsequently moves to Spec,TP in the embedded CP for EPP. The embedded subject is case-marked by the immediately c-commanding prepositional complementizer across the TP boundary (ECM). Further derivation involves the merge of a FocP and remnant movement of the CP/PP containing the dative argument to the Spec of the matrix TP (or LP) to satisfy EPP. This case-licensing scheme is also observed in obligation sentences with overt prepositional complementizers in languages such as English and French (e.g. Eng. *It is for him to decide*; Fr. *C'est à moi de partir* 'It is to me to leave.')

existential, regardless of copula type. This indicates that the argument structure of the possessive patterns with the existential, distinct from the locative construction. If we assume that the overt copula *est*' derives solely from the existential operator, following Kondrashova (1996), we do not have to conclude that distinct copula types reflect different argument structures.

Another independent argument in favor of the argument structure in (13a/14a) comes from different degree of degradation of *wh*-extraction from the possessor and the possessee in Russian. For a detailed discussion, see Jung (2008).

¹¹ The presence of low focus in the Russian possessive construction is independently justified by the Theme-Rheme structure in this type of construction proposed by Babby (1980) and by the Perspective Structure posited by Borschev and Partee (2002).

2.2.3 *Prepositional complementizers and the lack of PRO/expletives*

The structure in (14b), in which the Case on the external argument of the embedded TP is licensed by the immediately c-commanding preposition, is construed as an ECM structure. The dative case is licensed on the embedded subject structurally without any semantic contribution. This structure resolves the problem of the incompatibility of null expletives as illustrated in (3b) and the ungrammaticality of PRO dative argument in (5b). Let us recall that these two apparent control features derive from the distributional nature of PRO and null expletives: both are excluded from an overt Case position. In the proposed structure in (14b), a null expletive cannot appear in the Spec of the embedded TP, since in this position a constituent must be overtly case-marked by the prepositional complementizer. In this line of analysis, the lack of expletive in the given construction cannot be considered as evidence of a control structure.

The ungrammaticality of the PRO dative argument is also accounted for by this structure. In structure (14b), the subject of the embedded clause is case-marked by the prepositional complementizer that immediately c-commands it, and therefore must be overtly realized. The unembeddability of the dative argument as PRO in this construction may be paralleled by the ungrammaticality of the English prepositional complementizer *for* combined with PRO (**for PRO to Inf*).¹² In this line of analysis, it is not the dative argument's non-subject status but the immediately c-commanding prepositional complementizer that prevents the external argument from appearing as PRO.¹³

¹² See Henry (1995) for the grammatical *for to* in Belfast English (e.g., *I want them for to win*).

¹³ The analysis in (14b) may be extended to possessive and possessive-related constructions cross-linguistically. Any constructions that share the underlying structure in (14b) would not be embedded with a PRO subject. This prediction is borne out by the Russian possessive construction and the Hindi possessive and obligation sentences, as shown in (i-iii).

- (i) *Ja_i xoču [PRO_i byt' kniga]
 I_{NOM} want be_{INF} book
 Intended: 'I want to have a book.'
 - (ii) *Ram_i [PRO_i kai kitaabeN ho-naa] caah-taa hai.
 Ram many books be_{INF} want is
 Intended: 'Ram wants to have many books.'
- [p.c. R. Bhatt]

Given that the structure in (14b) accounts for why the construction is incompatible with covert expletive and PRO subjects, the raising analysis of the obligation construction remains on solid ground.

3 The distribution of infinitival datives in Russian

In the previous sections, I have proposed that the overt dative subject of infinitive is licensed by a null prepositional complementizer. In this section, I examine if this proposal adequately accounts for the distributional peculiarities of infinitival datives in general.

The first problem with respect to the distribution of infinitival datives is that an infinitival dative can optionally appear along with an overt complementizer *čtoby* ‘in order to’, as shown in (15a-b).

- (15) a. On prišel [*čtoby* ej ne obedat’ odnoj].
 he came in order her_{DAT} NEG eat_{INF} alone_{DAT}
 ‘He came so that she would not have dinner alone.’
 b. On_i zašel v magazin [*čtoby* PRO_i kupit’ maslo].
 he stopped by to store in order buy_{INF} butter
 ‘He stopped by at the store in order to buy butter.’

Since the complementizer would value the Case feature of the subject obligatorily, the optionality of the dative argument in (15a-b) might be problematic. This is resolved when we consider the exact location of *čtoby*. As shown in (16), the complementizer *čtoby* can also appear with a finite clause. In this respect, *čtoby* is similar to English *whether* in (17).

- (16) On eto skazal, [*čtoby* ona dogadalas’, gde on rabotaet].
 he that said so that she guessed where he works
 ‘He said that so that she would guess where he worked.’
 (17) a. It is not important [*whether* he knows about this].
 b. I_i have to decide [*whether* PRO_i to visit my parents or not].

(iii)*Ram_i [PRO_i yeh kitaab paRh-naa ho-naa] caah-taa hai.
 Ram this book read_{INF} be_{INF} want is
 Intended: ‘Ram wants to have to read this book.’ [p.c. R. Bhatt]

Whether has been conceived to be located in Spec,CP and not under the head C, given that it is compatible both with finite and non-finite clauses. In the detailed structure of the left periphery of the CP layer, suggested by Rizzi (1997), *whether* would be located in Spec,FinP and not under the Fin head. In the same way, *čtoby* must be considered to appear in a specifier position of CP. I assume that it would be Spec,ForceP since a *čtoby*-clause is subjunctive, having an illocutionary force. The null prepositional complementizer merges under the Fin head, whereas *čtoby* is located in Spec,ForceP. *Čtoby* signals the presence of the CP layer but does not participate in the licensing of the dative case. The overt dative case is licensed by an optional prepositional complementizer (cf. the optional *for* in English).

Another distributive peculiarity of the infinitival dative is its optional occurrence with infinitival imperative, as in (18).

- (18) Vsem vstat'!
 all_{DAT} stand up_{INF}
 '(You) all stand up!'

There are two possibilities to account for (18). First, since the infinitival construction in (18) is imperative, the illocutionary force of the sentence indicates the presence of ForceP. Thus, FiniteP must also be present in this sentence. In case the prepositional complementizer merges under the Finite head, the dative case is licensed. Alternatively, the sentence in (18) may be construed as a DIM sentence with a covert *be*.¹⁴

¹⁴ How is the proposed dative licensing scheme related to the dative PRO in an infinitival construction? Sentences (ia-c) exemplify the dative pronominal *odnomu* (alone), which is traditionally called the Second Dative.

- (i) a. Mne očen' važno [PRO/*emu prijti odnomu].
 me_{DAT} very important him_{DAT} come_{INF} alone_{DAT}
 'PRO/for him to come alone is very important to me.'
 b. Ja poprosil Ivana_i [PRO_i/*sestre_j prijti odnomu_i/*odnoj_j].
 I asked Ivan_{ACC} sister_{DAT} come_{INF} alone_{DAT.M/DAT.F}
 'I asked Ivan PRO_i/for the sister to come alone.'
 c. Ivan_i pošel domoj, [CP čtoby PRO_i/ej_j ne obedat' odnomu_i/odnoj_j].
 Ivan went home in order her_{DAT} NEG eat_{INF} alone_{DAT.MF}
 'Ivan went home PRO_i/for her not to eat dinner alone.'

4 Conclusion

Thus far, I have shown that the DIM construction with *be* in Russian is construed as a raising structure. I have proposed an underlying structure that can reconcile the possessive and dative obligation constructions. In this structure, the dative argument is licensed by the null prepositional complementizer in an ECM fashion within the embedded clause before it raises to a position in the matrix clause. This case-licensing strategy accounts for the apparent control properties such as the ungrammaticality of null expletive and PRO subjects in this construction, since both elements are excluded from the embedded subject position that is immediately c-commanded by a prepositional complementizer. I have shown that this proposal also adequately accounts for infinitival datives in general.

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It has been argued that the Second Dative results from agreement between the dative PRO and the pronominal (Comrie 1974, Babby 1998, Franks 2005). I do not attempt to spell out the source of the dative on PRO here due to limited space. However, the source of the dative on PRO must be different from that of the overt dative since the Second Dative can occur where overt dative arguments are excluded, i.e., in case there is no CP layer, as shown in (ia-b).

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Intensional Genitive Case and Existential Commitment

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In this paper, I investigate the semantics of Intensional Genitive Case in Russian, a phenomenon whereby certain intensional verbs can take genitive objects, as well as accusative ones. These verbs include *ždat'* (wait for), *zasluživat'* (deserve), *trebovat'* (demand), *prosit'* (ask for), etc. Both genitive and accusative Case-assignment with such verbs is exemplified in (1):

- (1) a. On ždal čuda / Dimu.
he waited miracle_{GEN} Dima_{ACC}
'He was waiting for a miracle / for Dima.'
- b. Ty zasluživaeš medali / medal'.
You deserve medal_{GEN/ACC}
'You deserve a medal.'

It can be seen that with some verb-object combinations, accusative Case-marking is obligatory, with some, the Case is obligatorily genitive, and yet with others, both Case-assignment options are available. In the latter case, considerable variation in native speakers' judgments is found as to which Case is preferable or even possible in a given sentence. The variation in judgments is partly due to a process of language change taking place in Russian whereby accusative Case is being used with increasing frequency (Neidle 1988). The judgments and tendencies I will be assuming are based on the answers to a questionnaire that was distributed to twenty native speakers of Russian.

1 Restrictions on Genitive Case-Assignment: Descriptive Facts

1.1 Semantic Properties of the NP

It has been pointed out in the literature that the choice of Case with intensional verbs is sensitive to a number of semantic properties of the NP, which leads to certain tendencies in Case-assignment (Neidle 1988, Bailyn 2004, Borshev et al. 2008, Kagan 2005, 2007). Thus, it has been shown that Intensional Genitive is more likely to be assigned to abstract NPs than to concrete ones, and to plural NPs, rather than singular ones. It also tends to be assigned to indefinite, rather than definite, objects, and within definite NPs, proper names are less likely to be genitive than NPs headed by common nouns. (See Kagan 2005, 2007 for a more detailed discussion.)

Below, I discuss in some detail two additional semantic properties, scope and existential commitment. These properties are especially strongly related to the choice of Case, since they seem to constitute a necessary (even though not a sufficient) condition for the licensing of Intensional Genitive.

Firstly, genitive objects are consistently interpreted within the scope of intensional verbs. In contrast, their accusative counterparts can take both wide and narrow scope.

- (2) a. Dima iščet švedskije marki.
 Dima seeks [Swedish stamps]_{ACC PL}
 'Dima is looking for Swedish stamps.'
- b. načal'nik trebujet pribyli.
 boss demands profit_{GEN}
 'The boss demands profit.'

Thus, (2a) may mean either that there is a particular set of stamps that Dima is looking for (wide scope reading) or that he is looking for *any* Swedish stamps (narrow scope reading). In this sentence, genitive Case-marking is unavailable. Here, we see that minimal (genitive/accusative) pairs are often unavailable within the phenomenon under discussion. In turn, (2b) can only mean that the boss demands that the employees work in such a way that there be profit. Namely, the genitive NP does not denote an entity that exists in the actual world (w_0) but rather gets

interpreted within the scope of the intensional predicate. Crucially, it cannot be used to refer to a sum of money which constitutes an already existing profit and which the boss wants to be given to him.

Indeed, the second and strongly related property is that genitive NPs are consistently characterized by lack of existential commitment (EC). Thus, EC is absent in (2b): the sentence does not entail that the profit already exists. EC is also absent in (3):

(3) Ja budu s neterpeniem ždat' vašix novyx rasskazov.

I will with impatience wait [your new stories]_{GEN PL}
'I will be waiting impatiently for your new stories.'

(3) means that the speaker will be waiting for the addressee's new stories *to be written*; the object NP need not have a referent in the actual world at the time of speech. EC is absent.

As noted above, scope and EC are especially closely related to the choice of Case, since genitive NPs consistently take narrow scope and lack EC. However, these properties are still insufficient to account for the alternation. First, accusative NPs may take both wide and narrow scope, and may but need not carry existential commitment. Still more importantly, sometimes, a narrow scope NP that lacks existential commitment is *obligatorily* assigned accusative Case. Intensional Genitive is unavailable. This is illustrated in (4):

(4) Dima iščet živuju vodu / *živoj vody / rusalku / *rusalki.

Dima seeks [alive water]_{ACC/GEN} mermaid_{ACC SG/GEN SG}
'Dima is seeking life-giving water / a mermaid.'

The speaker is most likely not to be committed to the existence of mermaids or of life-giving water; still, the NPs cannot appear in Intensional Genitive.

Partee and Borshev (2004) and Kagan (2005) propose that NPs that appear in this Case denote properties and are of the semantic type $\langle s, \langle e, t \rangle \rangle$. This analysis accounts for a wide range of facts, including the association between genitive Case and the indefinite, narrow scope interpretation. I believe that the property approach is correct. However, it is insufficient to account for such sentences as (4), in which the object

NP is analyzed as property-denoting under the influential Zimmermann's (1993) approach, but genitive Case-assignment is still unavailable.

1.2 Two Types of Intensional Verbs

An additional puzzle regarding the assignment of Intensional Genitive has to do with the fact that not all intensional verbs license genitive objects. With some of them, the object is always accusative, independently of any semantic properties. For instance, a verb like *imagine* does not license Intensional Genitive, and so the object in (5) is accusative, even though this is an abstract, indefinite NP that takes narrow scope and could probably be analyzed as property-denoting:

- (5) Maša predstavljajet (sebe) burju / *buri.
 Masha imagines herself storm_{ACC SG/GEN SG}
 'Masha imagines / is imagining a storm.'

Table 1 contains a (not exhaustive) list of Russian intensional verbs that take nominal complements. The verbs listed in the left column license Intensional Genitive; the ones that appear in the right column do not.

Table 1

Intensional Verbs that License Genitive Objects	Intensional Verbs that do not License Genitive Objects
<i>xotet'</i> (want), <i>želat'</i> (wish), <i>žaždat'</i> (thirst for), <i>trebovat'</i> (demand), <i>prosit'</i> (ask for), <i>ždat'</i> (wait), <i>oždat'</i> (wait, expect), <i>iskat'</i> (look for, seek), <i>izbegat'</i> (avoid), <i>zasluživat'</i> (deserve), <i>stoit'</i> (cost, be worth), <i>bojat'sja</i> (be afraid of)	<i>predvidet'</i> (foresee), <i>predskazyvat'</i> (foretell), <i>predstavljat'</i> (imagine), <i>voobražat'</i> (imagine), <i>risovat'</i> (paint), <i>izobražat'</i> (picture), <i>napominat'</i> (remind, resemble), <i>planirovat'</i> (plan), <i>obeščat'</i> (promise), <i>pridumyvav'</i> (invent)

Thus, we see that the ability to license Intensional Genitive divides intensional verbs into two groups. Crucially, the same or a very close distinction between two types of intensional verbs has already been made in the literature, in the context of what looks like a very different phenomenon – subjunctive mood. In particular, all those verbs that license Intensional Genitive also license subjunctive mood – either in their complement clause or in a relative clause embedded under them. In

turn, the verbs that appear in the right column do not license the subjunctive. Thus, the licensing of Intensional Genitive appears to correlate with the licensing of subjunctive mood. In what follows, I will argue that this correlation is not accidental. I will first consider an account that has been proposed for the distribution of subjunctive mood. Then, I will propose an analysis of Intensional Genitive under which this Case is treated as a nominal counterpart of subjunctive mood. In other words, I will propose that the semantic contribution of subjunctive mood to a clause is analogous to the semantic contribution of genitive Case-marking to an NP.

2 Subjunctive Mood: Farkas (2003)

For the purposes of this paper, I will assume the analysis of the subjunctive proposed by Farkas (2003). This analysis is formulated within the framework of dynamic semantics. Farkas proposes that a complement clause is subjunctive if it is characterized by the – Decided feature. Translating the basic idea into a non-dynamic framework, we can say that a clause is subjunctive as long as the proposition it contributes is neither entailed nor presupposed to be true. Crucially, this lack of commitment to truth must hold not only relative to the actual world but also relative to the set of worlds that is introduced by the intensional verb. For instance, consider epistemic predicates, such as *think* and *believe*. These predicates introduce the set of worlds that represents the worldview of the subject (or her epistemic state). This is the set of worlds that are compatible with the subject's vision of reality. Crucially, the proposition embedded under these verbs is entailed to be true in these worlds. Consider, for example, the sentence in (6):

(6) Mary believes that a unicorn entered her house.

This sentence entails that in every possible world that conforms to Mary's beliefs, the proposition *A unicorn entered Mary's house* is true. In other words, the embedded proposition is entailed to hold in the set of worlds introduced by the verb *believes*.

For this reason, epistemic predicates do not license subjunctive mood in Romance languages, as well as in Russian; their complement clauses

are obligatorily indicative, since commitment to truth is present (relative to the worlds introduced by the verb, or the *embedded context*).

Farkas demonstrates that an analogous situation holds for fiction predicates, such as *imagine*. These predicates introduce sets of worlds that represent a certain fictional version of reality, and the embedded proposition is entailed to be true in these worlds. As a result, the embedded clauses are obligatorily indicative.

In contrast, desideratives, such as *want* and *wish*, and directives (*order*, *request*) do license subjunctive mood. Farkas states that clausal complements of these predicates are not asserted to hold in any given set of possible worlds. Rather, she assumes the approach to desideratives proposed by Heim (1992). Heim argues against Hintikka (1969)-style view according to which these verbs introduce the set of the subject's want-worlds, i.e. worlds in which all the wishes of the subject are realized. (Had this been the case, we would expect these verbs to be very similar to epistemic and fiction predicates.) An important piece of evidence against this view comes from the fact that an individual may hold contradictory wishes. For instance, Heim (1992:195) points out that (7) may be true even if, in those worlds that conform to everything the speaker desires, she does not teach at all.

(7) I want to teach Tuesdays and Thursdays next semester.

By analogy with an individual's epistemic state, the set of worlds compatible with everything the subject desires should constitute an intersection of all the propositions that represent the wishes of the subject. If an individual has contradictory wishes, which is definitely possible, as illustrated above, the set of her want-worlds follows to be empty. This is an undesirable and counterintuitive result, since the individual clearly does have wishes.

For further evidence against the want-worlds approach, see Heim (1992). Crucially for our purposes, Heim rejects this view and proposes an alternative along the following lines. Verbs like *want* introduce an accessibility relation to the epistemic state of the subject, similarly to *believe*. However, the complement of the desiderative, unlike the complement of *believe*, is not asserted to hold in these worlds. Thus, *John wants to find a unicorn* clearly does not assert that the proposition *John finds a unicorn* is true in every possible world that conforms to

John's beliefs about *reality*. Rather, desiderative predicates trigger a world ranking, as is represented in (8).

(8) 'a wants φ ' is true in w iff

for every $w' \in E^{a,w}$:

every φ -world maximally similar to w' is more desirable to a in w than any non- φ -world maximally similar to w' .

For every world w' that belongs to the epistemic state of the subject, the worlds maximally similar to w' in which the embedded proposition is true are ordered higher than those worlds maximally similar to w' in which it is false.

To illustrate, the sentence *John wants to find a unicorn* roughly asserts that, as far as John is concerned, those worlds, maximally similar to reality, in which the proposition *John finds a unicorn* is true are ranked higher than the ones in which it is not. Essentially, this means that worlds in which the embedded proposition holds are more desirable in John's view than the ones in which it does not.

Crucially, it is not the case that a verb like *want* introduces a set of possible worlds in which the embedded proposition is entailed to hold. Rather, it is merely asserted that those worlds in which the proposition holds are ranked higher than the ones in which it does not. Therefore, subjunctive mood is licensed.

3 Intensional Genitive: The Proposal

Let us now turn back to genitive NPs. I propose that Intensional Genitive Case is subject to essentially the same restriction as subjunctive mood, although the former is sensitive to the properties of an NP and the latter, of a clause. Subjunctive mood signals the absence of commitment to the truth of the proposition contributed by a clause – in any given set of accessible worlds introduced in the sentence. Similarly, Intensional Genitive is only licensed in the absence of commitment to existence – again, not only in w_0 but also relative to any alternative version(s) of reality that are introduced by an intensional operator, including an epistemic state of the subject.

Let us consider again the notion of existential commitment. By default, a wide scope NP carries commitment to existence in the actual

world. For instance, (9a) entails and (9b) presupposes (9'), i.e. the existence of at least one green dog in w_0 .

- (9) a. Mary patted a green dog.
 b. Mary patted the green dog.
 (9') $\exists x [\text{dog}(x) \wedge \text{green}(x)]$

In the presence of an intensional or non-veridical operator, commitment to existence in the actual world may be cancelled. However, in most cases, it will be substituted by a commitment that the NP in question has a referent in some alternative possible world which is introduced in the sentence.

For instance, (6), repeated below for the sake of convenience, does not entail that unicorns exist in the actual world. However, the verb *believes* introduces the set of worlds that conform to Mary's worldview, and the sentence does entail that in these worlds, a unicorn exists.

- (6) Mary believes that a unicorn entered her house.

In order to capture the contrast between (9) and (6), let us introduce a distinction between two types of EC. *Absolute Existential Commitment* (AEC) is commitment to existence in the actual world. In turn, *Relative Existential Commitment* (REC) is commitment to existence in w_0 or in any alternative version of reality that is introduced in the sentence. (For our purposes, what is relevant is the set of worlds made accessible by the intensional verb.) In the definition (10), all such worlds are subsumed under the set W^S . Essentially, REC is commitment to existence in those possible worlds about which an assertion is being made in the sentence, typically, in our case, the actual world and the worlds introduced by the intensional verb.

- (10) Let S be a sentence with propositional content p. Let NP be a noun phrase that contributes the property P. Let w_0 be the actual world. Let \rightsquigarrow encode entailment and/or presupposition relation.

- a. An occurrence of an NP in S carries Absolute Existential Commitment iff
 $p \rightsquigarrow \exists x P(x, w_0)$

- b. An occurrence of an NP in S carries Relative Existential Commitment iff

$$\exists w [w \in W^S \wedge p \rightsquigarrow \exists x P(x,w)]$$

(where W^S contains the reference world and those worlds that stand to it in an accessibility relation introduced in the sentence.)

I propose that Intensional Genitive is only assigned in the absence of REC. In other words, it is only assigned to those NPs that lack EC relative to the actual world, as well as relative to the worlds introduced by the intensional verb. The restriction is formulated in (11):

- (11) An NP that appears in the direct object position in a sentence S may be assigned Intensional Genitive Case iff it lacks REC.

(11) predicts that genitive NPs must lack commitment to existence in the relativized sense, similarly to a large degree to the way in which subjunctive clauses lack commitment to truth.

4 Accounting for the Distribution of Genitive Objects

4.1 Two Types of Intensional Verbs

We are now in a position to account for the fact that some intensional verbs license Intensional Genitive, while others do not. Let us begin with the verbs whose complement clause is obligatorily indicative (*weak intensional verbs* in the terminology of Farkas 1985.) For instance, these include fiction predicates, such as *imagine* and *foresee*, which introduce a set of worlds that represents a fictional context. If they take a complement clause, the proposition it contributes is entailed to be true in these worlds. Therefore, subjunctive mood is not licensed. Analogously, if these verbs take an NP complement, it is entailed to exist in the introduced worlds, and, therefore, Intensional Genitive is unavailable. For instance, (12) entails that in the worlds that conform to Dima's imagination, the proposition *Lena left* is true. Similarly, (13) entails that in the worlds that conform to Dima's imagination, there exists a storm.

- (12) Dima predstavil sebe, čto Lena ujexala.
 Dima imagined himself that Lena left.
 'Dima imagined that Lena had left.'

- (13) Dima predstavil sebe burju.
 Dima imagined himself storm_{ACC SG}
 'Dima imagined a storm.'

Let us now turn to predicates that license the subjunctive and the genitive, such as desideratives and directives (*strong intensional verbs*). These verbs license subjunctive mood because their complement clause is not entailed to be true in the set of worlds they introduce. For instance, (14) does not entail that the proposition *Something changes* is true in any given set of worlds introduced in the sentence, including the set of worlds that conform to Dima's beliefs about reality.

- (14) Dima xočet / želajet, čtoby čto-nibud' izmenilos'
 Dima wants / wishes that-subj something change_{PAST}
 'Dima wants / wishes for something to change.'

Analogously, when these verbs take an NP complement, it need not carry existential commitment relative to any given world. Thus, (15) does not entail that the relevant changes actually take place either in the actual world or within Dima's vision of reality.

- (15) Dima xočet / ždjot / žaždet peremen.
 Dima wants / waits-for / thirsts-for changes_{GEN PL}
 'Dima wants / is waiting for / thirsts for changes.'

Thus, we have an explanation of the fact that Intensional Genitive is licensed only by a restricted group of intensional verbs, as well as of the correlation between the licensing of genitive Case and subjunctive mood.

4.2 Intensional Genitive with Strong Intensional Verbs

Finally, the last question to be addressed is how we account for the Case alternation with *strong intensional verbs*, those verbs that do license Intensional Genitive. Why is genitive Case not always licensed with the verbs in question?

For instance, it is not licensed on NPs that receive a wide scope interpretation. This fact is not surprising. An NP that takes wide scope relative to an intensional verb does carry REC, and so it is predicted to

be accusative. However, what about the NPs in (4), repeated below? Why cannot such NPs appear in Intensional Genitive?

- (4) Dima iščet živuju vodu / *živoj vody / rusalku / *rusalki.
 Dima seeks [alive water]_{ACC/GEN} mermaid_{ACC SG/GEN SG}
 'Dima is seeking life-giving water / a mermaid.'

It is important to point out that the factors governing the choice of Case are very complex. There is variation in judgments, and a number of semantic factors seem to be at work. The complexity results to a large degree from language change that has been mentioned in the Introduction. Intensional Genitive used to be the default Case of objects of strong intensional verbs. Currently, accusative is taking over, but different verbs still behave in somewhat different ways in this respect. With some verbs, e.g. *izbegat'* (avoid) or *bojat'sja* (be afraid), genitive is the default Case; with others (e.g. *iskat'* (seek)), accusative is the default, and yet with others, such as *ždat'* (wait), it is unclear which Case is more marked, and this may partly depend on the individual speaker. Different factors, not all of them semantic in nature, contribute to this complex state of affairs. For instance, *bojat'sja* contains the reflexive suffix *-sja* whose presence normally rules out accusative Case-assignment. Interestingly, with this verb, accusative objects are sometimes possible, but it is non-surprising that the dominant Case is genitive. What we see is that in certain instances, genitive Case-marking is present for reasons that are not semantic but rather etymological or syntactic in nature, which have to be separately investigated. (This point is made regarding certain types of genitive objects in Borshev et al. 2008.) The scope of this paper does not allow a detailed discussion of all the relevant issues. In the remainder of this section, I will discuss a certain distinction which accounts for a large portion of facts, including the unacceptability of the genitive variants of (4), and further reveals the relevance of REC.

Sentences in which a strong intensional verb takes an NP complement can have two different types of readings. If a person wants / asks / waits for something, she may be waiting for two different types of changes to take place in the world. First, she may be waiting for an entity that she believes to exist to come to occupy the same location as herself, or come to be under her possession. Thus, according to the sentence *John is waiting for Mary*, John wants for an already existing individual to

undergo a change of location. The same kind of interpretation is available with indefinite, narrow scope NPs. For instance, consider the sentence *A hunter is waiting for a wolf*. The hunter may be waiting for *any* wolf, not a specific animal. But, crucially, he must believe that wolves exist and be waiting for one of the *existing* wolves to move to the location he is occupying. I will refer to sentences of this type as exhibiting *Location-Oriented Attitude*.

Alternatively, a person may wait for or want for an entity that does not currently exist *to be instantiated*, to come into existence in the world. For instance, if it is true that *Dima is waiting for a miracle*, this does not mean that he believes that the miracle is already taking place and just wants for it to move to his location. Rather, he wants for the property *miracle* to be instantiated. He wants for the world to change in such a way that it would come to contain a new (abstract) object. I will refer to this type as *Instantiation-Oriented Attitude*.

Crucially, it appears that Case-assignment in Russian is sensitive to the Location-Oriented / Instantiation-Oriented contrast. There is no one-to-one relationship, since the relation between this distinction and Case assignment is indirect, and also for the reasons to be discussed at the end of this section, but a strong correlation is definitely present. In the case of Location-Oriented Attitude, the subject typically believes that some entity exists in the actual world, and is waiting for this existing entity to undergo change of location. Thus, REC is present, and accusative Case strongly tends to be assigned. In contrast, under Instantiation-Oriented Attitude, the subject wants for a new entity to come into existence, so there is no commitment on her part that the entity already exists in the world, REC is absent, and genitive Case is assigned. We can now account for the facts in (4). The sentence does not mean that Dima wishes for a new mermaid, or for life-giving water, to be created. This reading is absent. Rather, according to the sentence, Dima believes that mermaids exist (or at least considers this likely), and is trying to locate one of them (an analogous reading arises with *life-giving water* as the object)¹. Thus, we deal with Location-Oriented Attitude, REC is present, and consequently, the NP is obligatorily accusative.

¹ With *seek*, the object is not expected to undergo a change of location; rather, the subject attempts to come to occupy the same location as the object, or at least to identify the location of the latter. This difference between *seek* and other verbs will not be crucial for our purposes.

This approach makes it possible to account for a wide range of facts as far as Case-assignment by strong intensional verbs is concerned. For instance, it accounts for the fact that (2b) above, which can be translated as "The boss demands profit", where "profit" appears in the genitive Case, may only mean that the boss demands that the employees work in such a way that there be profit. Under this reading, REC is absent. With an accusative object, the sentence would mean that the boss demands that the money that constitutes the actual profit be given to him. Under this reading, Location-Oriented Attitude is involved, and REC is present. Analogously, as we have seen, "I will be waiting for your new stories" with a genitive object means "I will be waiting for your new stories to be written" (3). Here, Instantiation-Oriented Attitude is involved, and REC is absent. An additional example is provided in (16):

(16) Dima iščet ubežišče / ubežišča v etom dome.

Dima seeks shelter_{ACC SG / GEN SG} in this house
 'Dima is seeking shelter / a shelter in this house.'

Under its accusative variant, the sentence means that Dima is trying to locate an already existing shelter (probably a bomb shelter). Location-Oriented Attitude is thus exhibited. In turn, the genitive variant means that Dima wants for the house to become shelter for him. He wishes for the property *shelter* to come to be instantiated. REC is absent.

The analysis also sheds light on the fact that the verb *iskat'* (seek) tends to take accusative objects. This verb can be analyzed as having two related senses. Under the more basic sense, it denotes a relation between an individual and an object which the individual believes to exist and is trying to locate. This sense of the verb is found in sentences like *Dima is looking for a newspaper / a mermaid* and is associated with REC and, therefore, obligatory accusative Case-marking. Under its second sense, the verb means roughly *try to bring about, behave as to bring about, or even crave for*. This meaning is present in such phrases as *seek love* and *seek adventures*. Under this sense, the verb denotes a relation between an individual and a property which that individual wants to be instantiated (or behaves in such a way as to cause it to be instantiated). When the verb is used under this meaning, it obligatorily takes a genitive object. Since the first sense of *iskat'* discussed above seems to be prevalent, the verb appears to tend to take accusative complements.

Further, consider (17), in which many speakers accept genitive Case-assignment. This sentence seems to involve Location-Oriented Attitude. Still, genitive Case is licensed because a person who is waiting for a letter need not be committed that the letter already exists. Note that this is true even if the object is definite. Thus, REC is absent.

- (17) Maša ždjot (etogo) pis'ma.
 Masha waits [this letter]_{GEN SG}
 'Masha is waiting for (this) letter.'

Indeed, we can now account for the interaction between the choice of Case and definiteness. I propose that there is no inherent incompatibility between Intensional Genitive and definiteness per se. Rather, the relation between the two factors is mediated via EC. Definite NPs often carry existential presupposition, and are thus characterized by EC; therefore, they tend to appear in the accusative Case. However, sometimes, in the presence of a strong intensional verb, presupposition of existence may be absent, and in that case, Intensional Genitive becomes perfectly acceptable. This is illustrated in (17), as well as in (18) below. (18) exhibits Instantiation-Oriented Attitude, which means that the subject is not committed that the meeting has already taken place. As a result, genitive Case-assignment is acceptable, despite the object being definite.

- (18) Ja ždu etoj vstreči.
 I wait [this meeting]_{GEN SG}
 'I am waiting for this meeting.'

In addition, the proposed analysis makes it possible to relate Intensional Genitive to another phenomenon that involves the genitive/accusative alternation in the Case of the object, Genitive of Negation. As argued in Kagan (2007), under negation, genitive Case strongly tends to be assigned to objects that lack EC. Intensional Genitive is similar to Genitive of Negation in that it reveals the sensitivity of object Case-marking to the notion of existence.

While the proposed analysis accounts for a considerable portion of facts, further research is needed in order to explain the choice of Case in certain sentences that involve strong intensional verbs. Below I provide

one example that is not straightforwardly accounted for at this point and propose a number of possible directions for its analysis.

- (19) Lena ždjot avtobus / tramvaj / avtobusa / tramvaja.
 Lena waits bus_{ACC SG} tram_{ACC SG} bus_{GEN SG} tram_{GEN SG}
 'Lena is waiting for a bus / for a tram.'

In (19), Location-Oriented Attitude is involved, and REC is presumably present. Judgments regarding such sentences vary considerably and depend on the individual speaker as well as on the object: one of my informants accepts genitive Case-marking on *avtobus* but not *tramvaj*. How do we account for the fact that genitive marking is possible in some cases²?

Firstly, note that what Lena is actually waiting for is not the object *bus/tram* per se, but rather the means to get somewhere. If, for example, a bus arrives at the station and stays there due to a certain malfunction, intuitively, Lena's wish will not be satisfied. Thus, the complement NP corresponds not merely to an existing physical object but largely to the function that objects of this kind normally fulfill, or to an event that is associated with such objects³. From this perspective, (19) may be viewed as involving Instantiation-Oriented Attitude: Lena is waiting for the possibility of going somewhere, which is not yet available.

Secondly, it is possible that in (19), REC is not entailed but rather contributed by knowledge of the world. It is our knowledge of the world that tells us that a person who is waiting for a letter need not be committed to its existence, whereas a person who is waiting for a bus

² Judgments are clearly affected by the process of language change mentioned at the beginning of this section. Genitive Case-assignment in (18) could constitute a reflex of the older rule, which treats genitive as the default Case and which is still in competition with (11). A related possibility is that with *ždat'* (wait), Intensional Genitive is still close to being the default Case; it is certainly less marked semantically with this verb than with *iskat'* (seek).

³ In (i) below, the complement NP is clearly interpreted not as a physical object of the type normally denoted by the noun but rather as an event associated with such an object. The sentence means that Ivan deserves being executed by means of a guillotine, and thus exhibits Instantiation-Oriented Attitude.

(i) Ivan zasluživaet gil'otiny.
 Ivan deserves guillotine_{GEN SG}

believes that a relevant bus exists. This suggests that in some sentences, including (19), REC is not part of the compositional semantics, but is rather provided by the context or knowledge of the world. In such a case, Intensional Genitive is possible. (See Kagan (2007:147-150) for a more detailed discussion.) Whether or not REC is entailed under Location-Oriented Attitude is possibly dependent on the particular intensional verb involved. I leave further investigation of this issue to future research.

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Trills and Palatalization: Consequences for Sound Change

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It has been long noticed that it is difficult to maintain both trilling and palatalization as a secondary articulation (Brok 1910, Shevelov 1979, Ladefoged & Maddieson 1996, Kavitskaya 1997, among others). Various suggestions as to why this should be the case have been made in the literature. The general idea present in most accounts is that trilling and palatalization involve different constraints that make conflicting demands and are thus incompatible. For instance, Ladefoged & Maddieson (1996) claim that the raising of the blade and front of the tongue required for palatalization interferes with the aerodynamic conditions necessary for trilling. However, no phonetic studies have been attempted to clarify the exact nature of the incompatibility between trilling and palatalization.

We propose that conflicting physical constraints on the tongue dorsum can be held responsible for the sound changes that involve depalatalization of Proto-Slavic palatalized trilled /rʲ/. We show that palatalization, trilling, and different phonological environments impose conflicting demands on the dorsum, resulting in a physical instability that has phonological consequences.

1 Depalatalization of the trill in modern Slavic languages

Slavic languages provide a rich test case for the study of the depalatalization of the trill. The palatalization of the Proto-Slavic trilled /rʲ/ is affected to a different degree in almost all Slavic languages. Table

1 shows the reflexes of the plain and palatalized trill in modern Slavic (see also Kavitskaya 1997).

Proto-Slavic		r ^j	r
East Slavic	Russian	+	[r]
	Belarusian	–	[r]
	Ukrainian	±	[r]
West Slavic	Polish	[ʒ]	[r]
	Czech	[r]	[r]
	Slovak	–	[r]
	Upper Sorbian	±	[r] or [R]
	Lower Sorbian	+	[r] or [R]
South Slavic	Slovenian	[rj]	[r]
	Serbian	–	[r]
	Croatian	–	[r]
	Macedonian	–	[r]
	Bulgarian	±	[r]

Palatalization

- + still present in all environments
- entirely lost
- ± partially lost

Table 1. Reflexes of the Proto-Slavic trill (adapted from Carlton 1991)

While /r/ is preserved in all Slavic languages, /r^j/ is retained in only a few of them. Table 1 demonstrates that the palatalized trill is either completely lost, as in Belarusian (East Slavic), Polish, Czech, and Slovak (West Slavic), and Serbian, Croatian and Macedonian (South Slavic), partially lost, as in Ukrainian (East Slavic), Upper Sorbian (West Slavic), and Bulgarian (South Slavic), or fully preserved, as in Russian (East Slavic) and Lower Sorbian (West Slavic). Note that it is evident from

Table 1 that the depalatalization of the trill occurred independently in different Slavic languages and is not a proto-Slavic sound change.

Belarusian provides an example of a language in which /r^j/ underwent depalatalization in most dialects. The sound change happened in the period from the 12th to the 14th century. However, the /r/-/r^j/ opposition was subsequently restored in some areas because of the Russian influence (Wexler 1977). The data in (1) show that the nature of the /r^j/ in Belarusian is indeed restorative since it is not attested in the words like 'glad' and 'crawfish' in either pre-Belarusian or modern Russian cognates.

(1)	Belarusian	pre-Belarusian	Russian	
	r ^j at	radu	rad	'glad'
	r ^j ak	raku	rak	'crawfish'

Partial depalatalization is exemplified by the dialects of Ukrainian. While in the Carpathian region the original distribution of /r/ and /r^j/ is preserved, palatalization is completely lost in the areas from Volhynia to Podolia in the 15th century. However, there are intermediate dialects where palatalization of a trill is lost only partially, depending on the environment. For instance, in the Lviv area, there are dialects where /r^j/ is lost everywhere except before /i/, everywhere except before /a/, only syllable-finally, and only in unstressed syllables. The palatalization loss can be dated around the end of the 16th century. In Standard Ukrainian, /r^j/ is limited to the prevocalic position (Shevelov 1979).

In West Slavic, specifically in Czech and Polish, the palatalization of the trill was resolved through fricativization. In Czech, /r^j/ underwent spirantization, becoming a trilled fricative, as in (2). The change was completed around the 13th century.

(2) Spirantization of palatalized trill in Czech: *r^j > r̥

The examples in (3) show reflexes of the palatalized trill in modern Czech with the corresponding Russian cognates.

(3)	Czech	Russian	
	[rat]	[r ^j at]	'row'

[rɛka]	[rʲɛka]	‘river’
[parʲit]	[parʲit]	‘steams’

In Polish, the sound change went one step further, resulting in the detrillization of the trilled fricative (Stieber 1973), as in (4). This change is also dated around the 13th century.

(4) Detrillization of trilled fricatives in Polish: $r > ʒ$

In summary, Proto-Slavic /rʲ/ has a diverse set of reflexes in modern Slavic languages. That is, these languages seem to be sensitive to some incompatibility between the component features of /rʲ/. Palatalization does not seem to freely combine with trills, in the same way that it combines with stops, nasals, or fricatives. It is possible that the diversity of reflexes of /rʲ/ is simply an accident of Slavic diachrony. However, that is not likely due to the historical independence of the development of different reflexes in different Slavic languages, as shown in Table 1.

2 Phonetic study

2.1 Hypothesis: *physical conflict between palatalization and trilling*

The hypothesis we pursue is that there is *physical* conflict between trilling and palatalization, culminating in an instability of the segment /rʲ/. This instability is then resolved in different ways by the various Slavic languages discussed earlier. The hypothesis of physical incompatibility is supported by similar difficulties that other languages encounter in combining various rhotics with palatal articulations. Hamann (2003) shows that retroflexion and palatalization are cross-linguistically incompatible, and that previously cited counter-examples of palatalized retroflexes in Toda and Kashmiri are not phonetically realized as palatalized retroflexes. She argues that for both languages, what is sometimes transcribed as a retroflex with a secondary palatalization is really a sequence of a rhotic and a palatal. In a study of alveolar taps and trills in Catalan, Recasens (1991) showed that trills have greater coarticulatory resistance to /i/ than do taps, suggesting an incompatibility between the palatal articulation of /i/ and trilling. Moreover, Hall (2000) has shown through a study of secondary palatalization of various apical rhotics that there is a general ban on

palatalized apical rhotics. His data come from a wide variety of language families. There is, therefore, cross-linguistic evidence for the instability of palatalized rhotics.

Russian is a language that is reported to have preserved the palatalized trill /rʲ/, unlike most other Slavic languages. Therefore, Russian provides an excellent test-bed for seeing how potential conflicts are resolved. We have conducted an acoustic and an articulatory study to investigate the phonetic realization of /rʲ/ in Russian. The acoustic study focused on the occurrence of vibration in /rʲ/ vs. /r/, since that is one of the most distinguishing features of trills (Lindau 1985). If palatalized trills in Russian are truly trilled, we would expect similar frequencies of vibration for /r/ and /rʲ/. The articulatory study focused on the involvement of the dorsum of the tongue in the articulation of trills, as compared to other alveolar segments. The dorsum is important, since if it is retracted in trills, such retraction would be incompatible with palatalization, which requires dorsum fronting. In addition, the tongue back and dorsum have been shown to retract for other rhotics, like retroflex and bunched articulations in American English (Delattre and Freeman 1968), and has been argued to underlie the incompatibility of retroflexes and palatalization (Hamann 2003).

Even though several studies have discussed the interaction of rhotics and palatalization, and some have implicated the tongue dorsum as the site of interaction, we do not know of articulatory or acoustic studies that focus on this issue. The current contribution, through an acoustic and articulatory analysis, aims to investigate the interaction of trilling and palatalization through physical conflicts on the configuration of the tongue dorsum.

2.2 *Methods*

Data were collected from 5 native speakers of Russian (4 Female, 1 Male). The Haskins Digital Ultrasound System (Noiray et al. 2008) was used to image the tongue at 127 Hz. The probe was spring loaded to allow for free motion of the probe under the jaw. Acoustic data were simultaneously collected and synchronized with the tongue motion data, using a synchronization trigger pulse. Ultrasound was chosen, since it shows the entire tongue dorsum, the focus of this study. One and two syllable words were recorded, with /r/, /rʲ/, /t/, /tʲ/, /s/, /sʲ/, /l/, and /lʲ/ in

the following environments: word-initial, word-medial, and word-final, flanked by the vowels /a/, /e/, /u/, /i/. Multiple consonants were recorded in order to compare the positioning of the dorsum in the rhotic segments with that in other coronal segments. One limitation of the Haskins Digital Ultrasound System is that data can only be collected for 10-12 seconds per trial, with 2-3 seconds in between trials. The words were therefore collected in randomized lists, without a frame sentence, since a frame sentence would have made the experiment length prohibitively long. Four repetitions were collected from each speaker. A total of 384 tokens (8 Consonants x 3 Positions x 4 Vowels) were recorded. Example words for /r-r^j/ pairs with the vowel /a/ are given in (5).

(5) a. Word-initial

rat	'glad'	r ^j at	'row'
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b. Word-medial

pa ¹ rat	'parade'	pa ¹ r ^j at	'soar-3PL'
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c. Word-final

par	'steam'	par ^j	'steam-IMP'
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Since the focus of the acoustic study is on the difference in frequency of vibration between /r/ and /r^j/, only the data for those two consonants are included. Figure 1 shows spectrograms of the male Russian speaker's pronunciation of the words [rat] 'glad' and [r^jat] 'row'.

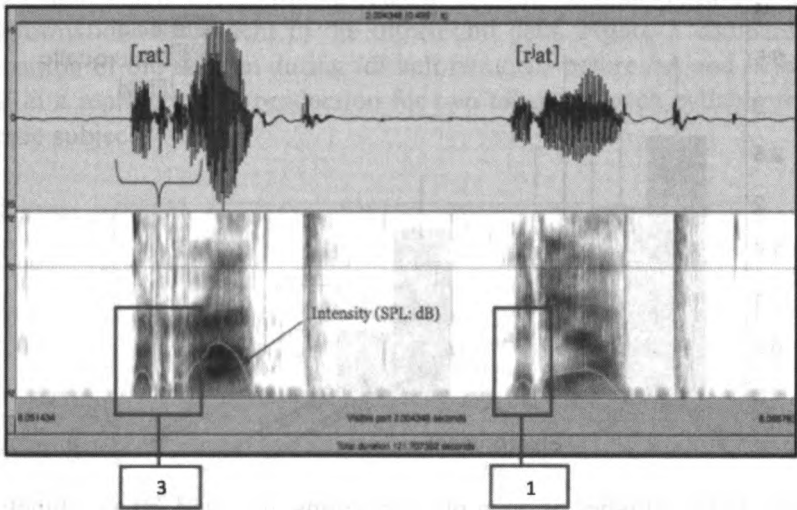


Figure 1. Spectrograms of the words [rat] ‘glad’ and [rⁱat] ‘row’

A trill contains portions where the vocal tract is briefly closed (tap-like articulations), which will here be called “open phase”, interspersed with portions where vocal tract resonances can be seen, which will here be called “open phase.” As can be seen in the Figure, [r] contains 3 open phase portions, whereas [rⁱ] contains only one. The same pattern is seen throughout the rest of the data.

2.3 Results

The first goal of this study was to determine the effect of palatalization and word position on trills. Figure 2 shows a bar plot of the mean and standard deviations of the number of open phase portions in the two rhotics across different environments.

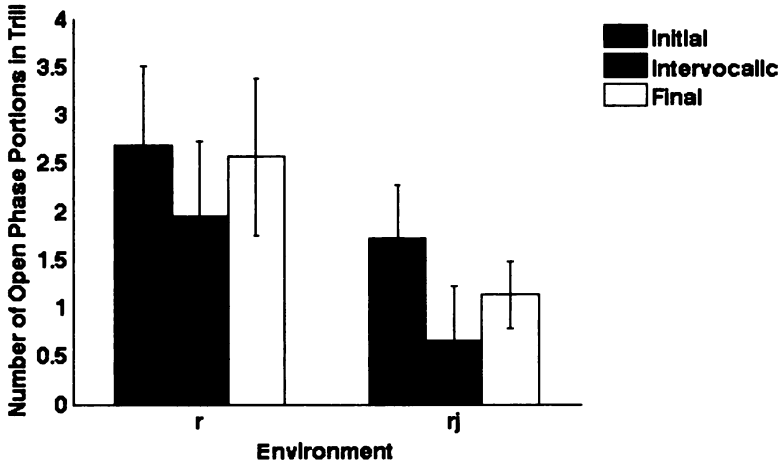


Figure 2. The number of open phase portions in /r/ and /r^j/ as a function of environment (word-initial, intervocalic, word-final)

For /r/, the mean number of open phase portions are 2.68 (0.82), 1.95 (0.77), 2.56 (0.81) in initial, intervocalic, and final positions, respectively. For /r^j/ the means and standard deviations are 1.7 (0.54), 0.65 (0.56), and 1.13 (0.34). As can be seen from the descriptive statistics, /r^j/ always has, on average, fewer open phase portions than /r/. Moreover, intervocalic position exhibits fewer open phase portions than initial and final position, for both categories. A repeated measures ANOVA revealed that /r/ has significantly more open phase portions than /r^j/ ($p < .001$, $F(1,262) = 168.35$). Environment (Initial vs. Intervocalic vs. Final) also had a significant effect on the number of open phase portions ($p < .001$, $F(2,261) = 21.54$), and a Tukey post hoc test confirmed that the mean for the intervocalic environment is lower than the other two.

The second goal of this study was to determine the role of the tongue dorsum in palatalized vs. non-palatalized trills. Ultrasound was used, since it allows a full view of the dorsum. In the first ultrasound experiment, we used B-Mode ultrasound, which images the entire tongue from blade to near the hyoid at 127 Hz. After edge detection, the configuration of the tongue at the most extreme position for each vowel

and consonant were found, based on the tongue back's greatest deformation, as evident in the ultrasound data. Figure 3 compares the position of the dorsum during /d/ before /a/, /r/ before /a/, and /r/ before /i/ in a representative production for two tokens of each syllable for the male subject.

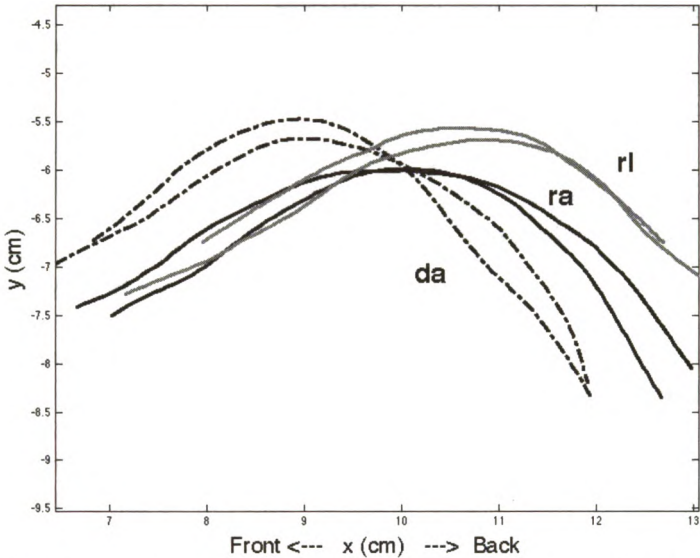


Figure 3. Comparison of tongue configurations during /r/ before /a/ and /i/ and /d/ before /a/.

As can be seen from the figure, /r/ shows a retracted dorsum. The /a/ following /d/ would be expected to apply a backward force on the dorsum during the /d/, through coarticulation, and the same coarticulatory process applies to the /r/ preceding /a/. But the dorsum retraction during /r/ is a great deal more than that during the /d/, and is unlikely to be due to coarticulation only. If the retraction of the dorsum for /r/ in /ra/ were due only to the /a/, then we would not predict that the dorsum would also be retracted for /r/ in /ri/, as is the case in Figure 3.

In the second experiment we used M-Mode ultrasound to investigate the changes in the vocal tract cross-section in the velar-uvular region, in /r/ vs. /r^l/, since it is this section that is expected to exhibit the greatest

difference for the non-palatalized vs. palatalized trill. In M-Mode imaging, the experimenter chooses a vocal section, and the scanner shows the change in the midsagittal distance across time in that section. Figure 4 shows what occurs in the velar-uvular region in /ara/ vs. /ar^ja/.

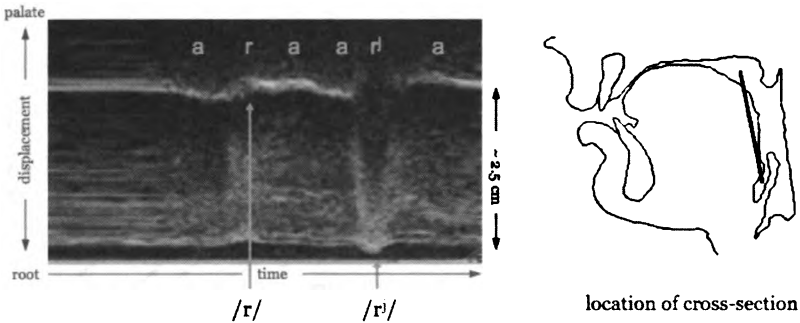


Figure 4. M-Mode comparison of the midsagittal distance function of /r/ and /r^j/ in the uvular region.

The right panel of the figure shows the cross-section selected. The upper bright white time series in the left panel shows the changes in that section, through the changes in the air layer right above the tongue (the white layer). During /ara/, the cross-sectional aperture is slightly higher during the /r/, than during the /a/. In contrast, during /r^j/, the tongue dorsum advances to such an extent that the cross sectional aperture at this location increases by almost 2.5 cm. During the /r/, the tongue is retracted, but during /r^j/, the root is strongly advanced, making the uvular region vertically continuous with the pharynx. This is an indication of the extent of the effect of palatalization on the tongue dorsum. Electromagnetic Midsagittal Articulography data on Russian palatalized trills confirm this finding (Kochetov 2005).

3 Discussion

Our interpretation of the results of the acoustic study is that the amount of trilling is gradient, when comparing /r/ and /r^j/ in different environments. Within each environment, /r/ has more trill vibration than

/r^j/, and for both segments, word initial and final environments exhibit a higher frequency of trill vibration than intervocalic environment. It therefore seems that there are two factors that weaken trilling, palatalization and intervocalic environment. Our claim is that conflicting demands on the tongue dorsum explain both the effect of the V_V environment and palatalization on trilling.

Even though the tongue tip is the primary articulator in the production of Russian trills, the tongue back seems to be necessarily retracted, as shown in the ultrasound data in the previous section, as well as in the Recasens (1991) study of Catalan trills. To understand the need for dorsum retraction during tongue tip trills, it is necessary to consider the physical state of the tongue tip required for the initiation of trilling. McGowan (1992) has shown through simulation that the tongue tip has to be of a very specific effective mass, so that velocity of air above the tip would allow the tip to flutter. The muscles of the tongue contract in such a way as to manage the effective mass of the tongue that will collaborate with the aerodynamic conditions required for trilling. The purpose of tongue back retraction during the tongue tip trill is to stabilize the tongue dorsum. Retraction immobilizes the dorsum, so that trilling can affect only the front portion of the tongue. If the entire tongue is mobile and has the same effective mass, a great deal of the vibration energy would be dissipated in the by the more massive dorsum, inhibiting the vibration of the tip. Immobilization through retraction renders the dorsum highly massive and incapable of flutter.

Two factors can conflict with trilling by inhibiting the retraction of the dorsum. First, palatalization requires the dorsum of the tongue to be fronted into the palatal region. Palatalization therefore weakens, and may totally inhibit, trilling due to its fronting of the tongue back. Second, vowel-to-vowel articulation in a VCV environment requires the dorsum position to be managed more by the vowels than by the intervening consonant. Öhman (1966) showed that tongue dorsum motion in VCV sequences is continuous, with the consonant acting as a perturbation on the smooth V_V motion. Perkell (1969) attributed the vowel-wave and consonant-perturbation notion to different muscular systems being active in vowel and consonant production. Since the trill does not have as much control of the tongue back in a VCV environment, as in a CV or VC environment, we would expect weaker trilling in VCV, as evident in the

data in Figure 2. There are data from other languages in support of this hypothesis. In Farsi, the rhotic surfaces as a tap intervocalically, as in [berid] ‘go’ vs. trill elsewhere, as in [rah] ‘road,’ [æɾteʃ] ‘army,’ [qædri] ‘a little bit,’ [ʃir] ‘lion’ (Lazard 1992).

As discussed earlier, /r^j/ is a segment that has a diverse set of reflexes in the modern Slavic languages. Trilling requires the dorsum to be retracted, while palatalization requires it to be fronted, and the surrounding vowel(s) pull the dorsum to their preferred position due to coarticulation. The competition between trilling, palatalization, and the surrounding vowels on the dorsum in /r^j/ is a plausible reason for the instability of the segment in the diachronic development of Slavic, and perhaps other languages.

4 Conclusions

In this paper, we have shown that conflicting articulatory constraints on the dorsum constitute the source of the instability of palatalized /r^j/. The instability has phonetic consequences in Russian and provides evidence for our hypothesis that this physical conflict is a part of an explanation for the depalatalization of /r^j/ in Slavic.¹

This paper represents only the beginning of a larger research project. In the future, we plan to collect more articulatory and acoustic data on Russian which will allow us to study the dynamics of /r^j/ in various contexts in more detail. We also plan to extend the Russian study to other modern Slavic languages that exhibit the contextual conditioning of depalatalization and study the various resolutions of the physical conflict in question. Specifically, since fricativization can be a resolution of the instability of /r^j/, as in Czech and Polish, a separate study is called for. Finally, the future study of Slavic palatalized trills will allow us to consider implications of the proposed type of explanation in other language families e.g., Romance or Bantu, where the instability of /r/ in the environment of front vowels has been reported.

¹ Note, however, that another part of the explanation is potentially connected to the acoustics of trills: e.g., word-final trills depalatalize in some dialects of Ukrainian since the cues for palatalization are in the following vowel. It is outside of the scope of this paper to deal with these effects.

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Latent Consonant Harmony in Russian: Experimental Evidence for *Agreement by Correspondence**

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It has been recently proposed that phonological constraints enforcing consonant harmony (long-distance consonant assimilation) are grounded in functional exigencies of speech production. Specifically, the *Agreement by Correspondence* approach (Walker 2000; Hansson 2001, 2007; Rose & Walker 2004) hypothesizes that patterns of consonant harmony originate in difficulties at the level of phonological planning and phonetic implementation of featurally similar consonants.

One interesting prediction of this approach is that harmony-like patterns may arise spontaneously, under certain conditions, even in languages that do not exhibit consonant harmony as a phonological process. In this study we test this prediction experimentally, by examining patterns of errors involving sibilant fricatives in Russian, a language that does not exhibit consonant harmony as a phonological process.

1 Consonant Harmony and Agreement by Correspondence

Consonant harmony, or long-distance assimilation of consonants, is characterized by a number of salient properties. Consonants participating in harmony are featurally similar to each other, and intervening segments are apparently unaffected, skipped over. Harmony may involve various

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consonantal features: laryngeal, place, nasality, etc., and can be manifested as alternations or morpheme structure constraints (Hansson 2001; Rose & Walker 2004; but see Gafos 1999 for a different approach). The most common sub-type of consonant harmony is coronal sibilant harmony (Hansson 2001).¹

A prototypical example of sibilant consonant harmony, from Sarcee (Athapaskan), is given in (1). Only sibilant obstruents (/s ts' ʃ tʃ tʃ'/) interact in the process, showing agreement in the feature [+anterior]; intervening vowels and consonants are not apparently affected. The harmony is asymmetric in several respects: it is regressive (right-to-left) rather than progressive (left-to-right); [+anterior] sibilants (/s ts'/) rather than [-anterior] sibilants are the targets (undergoers) of the process; [-anterior] sibilants (/ʃ tʃ/) are the triggers of the process. These directionality and target/trigger asymmetries are representative of most sibilant harmony systems (Hansson 2001).²

(1) Sibilant harmony in Sarcee (Cook 1984, cited in Hansson 2001)

/si-tʃogo/	→ [ʃi-tʃogo]	'my flank'
/si-tʃiz-aʔ/	→ [ʃi-tʃiɬ-aʔ]	'my duck'
/na-s-ɣatʃ/	→ [na-ʃ-ɣatʃ]	'I killed them again'
/sa-ts'i-gu-si-ni-s-jaj/	→ [sa-ts'i-gu-si-ni-ʃaj]	
	→ [ʃa-tʃ'i-gu-ʃi-ni-ʃaj]	'you forgot me'

The *Agreement by Correspondence* approach (ABC: Walker 2000; Hansson 2001, 2007; Rose & Walker 2004) captures properties of consonant harmony systems using a set of Correspondence C↔C constraints, Identity[F] CC constraints, and the traditional Identity[F] Input/Output constraints. Correspondence C↔C constraints impose a correspondence relation on two segments cooccurring in an output string. For example, the constraint Corr S↔Š requires that sibilant fricatives are in correspondence relation, regardless of their position in the string (e.g. [s...ʃ]). Fixed rankings of such correspondence encode similarity relations, for example, Corr S↔Š (sibilant fricatives, [s...ʃ]) » Corr S↔F (all fricatives, [s...f], [ʃ...x], etc.). Identity[F] CC constraints require

¹ Hansson (2001) identifies 46 languages exhibiting sibilant harmony, as alternations and/or morpheme structure constraints.

² All cases of progressive (left-to-right) application of sibilant harmony appear to involve root/stem control; in some systems both [+anterior] and [-anterior] sibilants are targets; there is only one case where [-anterior] sibilants are targets to the exclusion of [+anterior] sibilants (see Hansson 2001 for details).

featural identity of segments in correspondence relations. For example, Ident-CC (Place) requires that a pair of segments [s_i...f_j] correspond to each other. Such constraints can also encode directionality, for example, the ranking Ident-C_RC_L(PI) » Ident-C_LC_R (PI) ensures regressive (right-to-left) direction of harmony in [s_i...f_j] (→ [f_i...s_j]) and no change in [f_i...s_j]. Finally, the traditional Identity[F] Input/Output constraints can encode relative faithfulness to feature values. For example, the ranking of the faithfulness Input-Output constraint to [-anterior] above the faithfulness Input-Output constraint to [+anterior] (Ident IO[-anterior] » Ident IO[+anterior]) ensures that [-anterior] is always a trigger and not a target in the process ([s_i...f_j] → [f_i...s_j], but not → [s_i...s_j]). The tableau in (2) illustrates a partial agreement by correspondence analysis of Sarcee sibilant harmony.

(2)

	/si-tʃogo/	Id-C _R C _L (Place)	Id-IO [-ant]	Corr S↔Č	Id-IO [+ant]	Id- C _L C _R (Place)
a.	s _x itʃ _y ogo			*!		
b.	s _x itʃ _x ogo	*!				*
c.	ʃ _x itʃ _x ogo				*	
d.	s _x its _x ogo		*!			

The Agreement by Correspondence approach hypothesizes that the phonological constraints enforcing consonant harmony are grounded in functional exigencies of speech production – difficulties at the level of phonological planning and phonetic implementation of featurally similar consonants (Hansson 2001; Rose & Walker 2004). Some evidence for functional grounding of agreement constraints comes from psycholinguistic and phonetic research on speech errors. In particular, studies of speech errors have identified asymmetries similar to consonant harmony patterns: palatal bias ([+anterior] → [-anterior]) and anticipatory (regressive) directionality (Fromkin 1971; Shattuck-Hufnagel & Klatt 1979; Stemberger 1991; Frisch 1996, on English). Such errors were found to be either categorical or gradient (partial gestural intrusions: Pouplier & Goldstein 2005; cf. Mowrey & MacKay 1990; Frisch & Wright 2002; Goldrick & Blumstein 2006; Goldstein et al. 2007; Pouplier 2008; but see Stemberger 2007 for a different interpretation of gradience).

One prediction based on the phonetic grounding hypothesis is that harmony-like patterns may arise spontaneously, under certain conditions, even in languages that do not exhibit consonant harmony as a phonological process. The goal of this study is to test this prediction experimentally, by examining patterns of errors involving Russian sibilant fricatives.

2 Russian Sibilant Fricatives

2.1 Phonology

Russian exhibits a complex set of sibilant obstruents with a four-way contrast in voiceless fricatives /s s^j ʃ ʃ^j/ (Avanesov 1984; Timberlake 1993), that can be described as phonologically differentiated by the features [±anterior] (anteriority/posteriority /s s^j/ vs. /ʃ ʃ^j/) and secondary articulation [±back] (velarization/palatalization: /s ʃ/ vs. /s^j ʃ^j/) (3).

(3) a.	/s/	sol’	соль	‘salt’
	/s ^j /	sěl	сёл	‘villages, gen.’
	/ʃ/ [ʃ]	šĕlk	шĕлк	‘silk’
	/ʃ ^j / [ʃ ^j]	ščĕlk	щĕлк	‘click’
b.	/s/	sbros	сброс	‘dump’
	/s ^j /	broš’	брось	‘throw, imp.’
	/ʃ/ [ʃ]	broš’	брошь	‘broach’
	/ʃ ^j / [ʃ ^j]	boršč	борщ	‘borsht’

Importantly for the current study, the language shows no apparent restrictions on combinations of sibilant consonants within a word or a root, as shown in (4). (It should be also noted that the four segments differ in terms of their relative frequency (/s/ > /s^j/, /ʃ/ > /ʃ^j/; Kučera & Monroe 1968: 31) and in patterns of alternations (mainly /s/ - /s^j/ and /s/ - /ʃ/; Timberlake 1993)).

(4)	ʃ...s	šustryj	шустрый	‘quick’
	s...ʃ ^j	suščnost’	сущность	‘being’
	s...ʃ	suša	суша	‘land’
	ʃ ^j ...s ^j	sčast’je	счастье	‘happiness’

In terms of the ABC analysis, Russian exhibits a ranking where constraints triggering sibilant harmony are dominated by Input/Output

faithfulness constraints: Ident[±ant] » Id-CC(Place), Corr S↔Š, etc. Yet, rankings of subsets of relevant constraints are presumably the same as in languages with sibilant harmony, since these rankings are assumed to be phonetically/cognitively motivated. Specifically, this refers to the rankings encoding the target/trigger asymmetries (Ident-IO[-anterior] » Ident-IO[+anterior]) and directionality (Ident-C_RC_L(Place) » Ident-C_LC_R(Place)). One may also expect fixed rankings of correspondence constraints referring to segment pairs that differ in similarity, for example, Corr S^F↔Š^F » Corr S↔Š (where C^F↔C^F stands for segments that share secondary articulation features). The tableau in (5) illustrates a relevant subset of the Russian grammar.

(5) Partial ABC analysis of Russian (no sibilant harmony)

	/s ^j ...f/	Id-IO [-ant]	Id-IO [+ant]	Id- C _R C _L (Place)	Corr S ^F ↔Š ^F	Corr S↔Š	Id- C _L C _R (Place)
a.	s ^j _x ...f _y					*	
b.	s ^j _x ...f _x			*!			*
c.	f _x ...f _x		*!				
d.	s ^j _x ...s _x	*!					

2.2 Phonetics

Based on previous descriptions of articulation of Russian fricatives (using x-ray tracings and static palatography: Avanesov 1984; Bolla 1981) and our current work on the dynamic aspects of these sounds using ultrasound (with Tim Bressman, in prep.), we assume the gestural representations for the Russian fricatives (supra-laryngeal gestures) shown in (6). These representations specify articulatory targets of articulatory gestures – linguistically-significant movements of articulators, following Browman & Goldstein (1989).

(6) Articulatory gestures involved in the production of Russian fricative sibilants. TT = Tongue Tip; TB = Tongue Body; [critical], [narrow], and [wide] refer to constriction degrees.

Consonant	Primary constriction gesture	Secondary constriction gesture
/s/	TT [critical, alveolar]	--
/sʲ/	TT [critical, alveolar, down]	TB [narrow, palatal]
/ʃ/ [ʂ]	TT [critical, palatal, up]	TB [narrow, velar]
/ʃʲ/ [ʂʲ:]	TB [critical, palatal] (TT [down])	(TB [narrow, palatal])

Several points in this table deserve special attention. First, the anterior nonpalatalized fricative /s/ is gesturally relatively simple, lacking the tongue body constriction. Second, the anterior palatalized fricative /sʲ/ has a dual articulatory nature; it is similar to /s/ by having an alveolar primary constriction, while being similar to the other fricatives by having a more posterior tongue body constriction. These gestural properties may render /s/ and /sʲ/ relatively dynamically unstable, when featurally similar (and possibly more gesturally complex) consonants are planned and produced in the same utterance (cf. Pouplier & Goldstein 2005 on the English contrast /s/ vs. /ʃ/).

3 Experiment

The goal of this experiment was to investigate patterns of speech errors with Russian fricatives and to test parallels between errors and consonant harmony patterns.

3.1 Method

Four native speakers of Russian participated in the study: two females (S1 and S2) and two males (S3 and S4) from Perm'. The first three speakers were monolinguals recorded in Russia; the last speaker was a late English bilingual (the first author), recorded in Toronto, Canada.

The stimuli were two-word (nonsense) utterances with alternating onset consonants of the type $C_1ap C_2ap$, where C_1/C_2 differed in primary (anterior/posterior) and secondary places (velarized/palatalized). The list of stimuli is given in (7). Each item was presented one at a time in Cyrillic; all instructions were given in Russian. The task employed was the repetition task (cf. Pouplier & Goldstein 2005; Goldstein et al. 2007), where a speaker was asked to repeat each utterance as fast as possible.

To determine the ‘default’ acoustic properties of the four fricatives, the speakers were also asked to produce them in the following nonsense words: a'sa, a's^ja, a'ʃa, a'ʃ^ja (presented in Cyrillic: аса́, асá, ашá, ашá). These will be referred to as ‘control items’.

(7) Target stimuli used in the experiment

C_1	C_2	<i>Item</i>
s [+ant, +bk]	s ^j [+ant, -bk]	sap s ^j ap сап сяп
	ʃ [-ant, +bk]	sap ʃap сап шап
	ʃ ^j [-ant, -bk]	sap ʃ ^j ap сап щап
s ^j [+ant, -bk]	s [+ant, +bk]	s ^j ap sap сяп сап
	ʃ [-ant, +bk]	s ^j ap ʃap сяп шап
	ʃ ^j [-ant, +bk]	s ^j ap ʃ ^j ap сяп щап
ʃ [-ant, +bk]	s ^j [+ant, -bk]	ʃap s ^j ap шап сяп
	ʃ ^j [-ant, +bk]	ʃap ʃ ^j ap шап щап

The recordings of S1-S3 were made directly to a laptop computer using a head-mounted dynamic microphone Shure SM-10A in a quiet room; recordings of S4 were made to a portable digital recorder Fostex FR-2 using a cardioid condenser microphone AT3035 in a sound-attenuated booth at the University of Toronto phonetics lab. The sampling rate was 44 kHz with 16-bit resolution. On average, 178 tokens were collected per speaker, or 22 tokens per each target utterance.

Acoustic analysis of control items included a range of measurements previously used in studies of fricatives (Gordon et al. 2002, Kochetov & Lobanova 2007, Padgett & Zygis 2007, among others): fricative duration (ms), relative intensity of fricative noise (compared to the following vowel, dB), formant transitions to the following vowel - F1, F2, F3 (Hz), and the centre of gravity – mean frequency of fricative noise (COG, Hz). The results showed that COG and F2 distinguished the contrasts most consistently. COG values for males were about 5500-5600 Hz for /s/ and /s^j/, and about 3800 Hz for /ʃ/ and /ʃ^j/; for females, they were about 5600-6100 Hz for /s/ and /s^j/, and about 3700-3900 Hz for /ʃ/ and /ʃ^j/; F2 values for males were about 1400 Hz for /s/ and /ʃ/, and about 1850 Hz for /s^j/ and /ʃ^j/; for females, they were about 1600-1700 Hz for /s/ and /ʃ/, and

about 2050-2100 Hz for /sʲ/ and /ʃ/.³ Figure 1 illustrates the acoustic contrasts among the four fricatives, as produced by Speaker 2 (largely representative of all the participants). The anterior/posterior contrasts correspond to higher or lower COG (high or mid frequency noise, correlated with the length of the front oral cavity); the palatalized/non-palatalized contrasts correspond to higher or lower F2 (correlating with the front/back position of the tongue body).

Given these findings for control items, the acoustic analysis of target utterances was limited to the measurements of COG of fricative noise and F2 at the onset of the following vowel. The details of the token classification into errors and non-errors will be discussed below.

³ All the speakers produced the ‘ш’ sound as a palatalized fricative, consistently with the standard Russian pronunciation (Avanesov 1984: 112–114). For most speakers, this fricative was significantly longer than /ʃ/ and /s/, but not necessarily longer than /sʲ/ (S1, S2, and S4; no any differences for S3). The posterior fricatives tended to have higher intensity than their anterior counterparts: /ʃ/ > /s/ (S1, S2, S4) and /ʃʲ/ > /sʲ/ (S1, S2, S3).

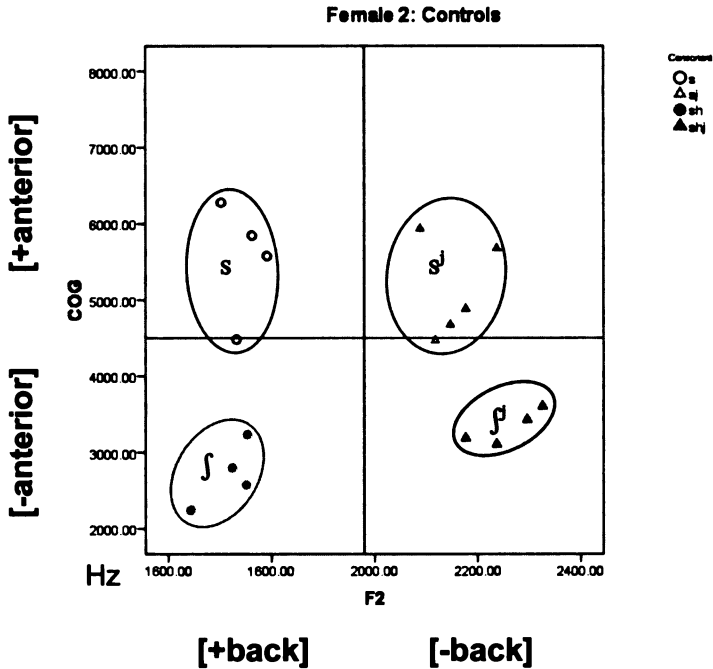


Figure 1. Tokens of the fricatives /s sʲ ʃ ʃʲ/ in control (V_V) utterances produced by speaker 2, plotted by centre of gravity of fricative noise (COG, in Hz) and second formant (F2, in Hz) values at the onset of the following vowel. Vertical and horizontal lines correspond to the means for each parameter.

3.2 Predictions

It was expected that most productions of sibilants would be error-free, given the assumed ranking of relevant constraints for Russian (Ident-IO[±ant] » Ident-CC(Pl), Corr S↔Š; see section 2). Most errors were expected to be assimilatory, rather than dissimilatory or exchange (metathesis-like) errors, since phonological long-distance interactions of sibilants are predominantly assimilatory. With respect to targets and triggers of assimilatory errors in primary place, it was expected that [+anterior] fricatives (/s/ and /sʲ/) would be the primary targets and [-anterior] fricatives (/ʃ/ and /ʃʲ/) would be the primary triggers (given the functionally-motivated ranking Id-IO[-anterior] » Id-IO[+anterior]). This prediction was also based on previous speech error studies with English fricatives /s/ and /ʃ/ (Stemberger 1991, among others).

With respect to directionality, errors were expected to be predominantly regressive (anticipatory) (given the assumed ranking $\text{Id-C}_R\text{C}_L(\text{Place}) \gg \text{Id-C}_L\text{C}_R(\text{Place})$). With respect to similarity, consonants that agreed in secondary articulation ($/s/$ and $/ʃ/$, $/s^j/$ and $/ʃ^j/$) were expected to participate in errors to a greater extent than consonants that did not agree in it ($/s/$ and $/ʃ^j/$, $/s^j/$ and $/ʃ/$) (given the assumed ranking $\text{S}^F \leftrightarrow \check{\text{S}}^F \gg \text{Corr S} \leftrightarrow \check{\text{S}}$).

It was difficult to make specific predictions about errors in secondary place, given the paucity of long-distance assimilation involving secondary articulations (Hansson 2007). Consonants with secondary articulation, especially palatalization, have a strong effect on adjacent vowels; it was therefore hypothesized that errors with palatalized consonants may show some properties of palatal vowel harmony (with [-back] as a trigger and progressive directionality).

Finally, phonetic realization of primary and secondary articulation errors was expected to be both gradient/partial and categorical/complete. It was also expected that phonetic gestural properties (e.g. the relative dynamic instability of $/s/$ and $/s^j/$ in the context of featurally similar consonants) of segments could play a role.

3.3 Results

A preliminary analysis of data identified disfluent productions, i.e., errors that a speaker attempted to correct (e.g. $\text{sap } ʃ^j\text{ap} \rightarrow ʃ\text{-sap } ʃ^j\text{ap}$) or non-errorful hesitations and false starts (e.g. $\text{sap } ʃ\text{ap} \rightarrow \text{s-sap } ʃ\text{ap}$). These accounted on average for 11% of all collected tokens. The focus of this paper, however, will be on fluent productions, that is, utterances without attempted corrections or hesitations (cf. Frisch & Wright 2002).

For each utterance, the last 10-11 tokens of fluent productions were selected for acoustic analysis (more tokens were collected and analyzed for S4). The results of the analysis show that the four categories $/s s^j ʃ ʃ^j/$ were largely kept distinct (based on statistically significant differences between in $/s s^j/$ vs. $/ʃ ʃ^j/$ in COG and $/s ʃ/$ vs. $/s^j ʃ^j/$ in F2, consistent with the findings for control items). However, both categorical and gradient deviations from the expected patterns were often observed, overall and in terms of individual tokens. This is illustrated in Figure 2, which plots all fluent productions of the four consonants by Speaker 2. Note the overall greater within-category variability, compared to the production of the same consonants in control items, whose range is indicated by the circles and vertical/horizontal lines (see Figure 1).

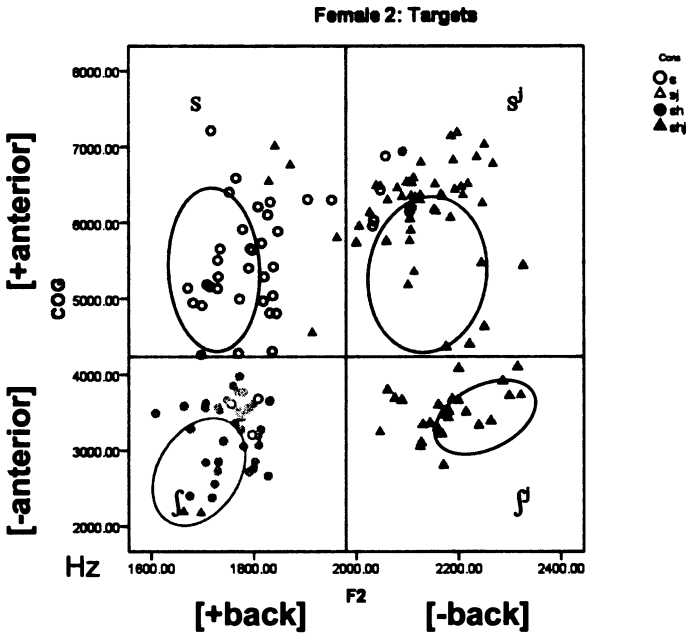


Figure 2. Tokens of the fricatives /s sʲ ʃ ʃʲ/ in target (C₁ap C₂ap) utterances produced by speaker 2, plotted by centre of gravity of fricative noise (COG, in Hz) and second formant (F2, in Hz) values at the onset of the following vowel. Ovals and vertical/horizontal lines correspond to the distribution of the four categories and means for each parameter in control items.

To further analyze the data, it was necessary to consistently classify all productions as errors or non-errors. To do that, we adopted the following error metric: An error was defined based on a midpoint between innerquartile means (IQM) for 2 categories (cf. Pouplier 2008) for either COG or F2. This procedure excludes from consideration 25% of tokens at both ends of the lowest-to-highest continuum, effectively eliminating all outliers. As shown in Figure 3, the threshold for the /s/ vs. /sʲ/ contrast for Speaker 2 was determined as a midpoint between the innerquartile means for both consonants. All tokens of the intended /s/ that had F2 below this threshold (1957 Hz) were classified as non-errors ([+back]) and those above it were classified as errors ([-back]). Similarly, the threshold for the /s/ vs. /ʃ/ contrast was a midpoint between the IQM values for the two consonants. All tokens above the threshold (4458 Hz)

were classified as non-errors ([+anterior]), and all tokens below it as errors ([-anterior]).

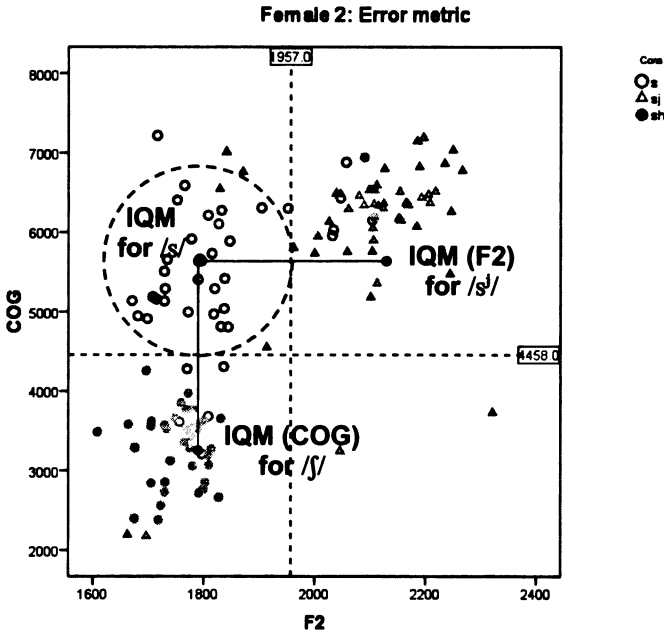


Figure 3. An illustration of the classification procedure where all tokens of the intended /s/ are classified as errors and non-errors based on midpoints between pairs of innerquartile means (IQM) for F2 and COG of the categories /s/, /sʰ/, and /ʃ/. See the text for details.

Errors determined by this procedure were further labeled as either ‘assimilatory’ (e.g. *sap* *ʃap* → *ʃap* *ʃap*, *sʰap* *sap* → *sʰap* *sʰap*), ‘dissimilatory’ (*sap* *sʰap* → *sap* *ʃap*), or ‘exchange errors’ (metathesis-like; e.g. *ʃap* *sap* → *sap* *ʃap*). Such errors could be either categorical or gradient (in the sense of Goldstein et al. 2007); however, no attempt was made to distinguish the two types. Further, tokens that belonged to an intended category but had more extreme COG or F2 values (determined as the distance from IQM to the relevant threshold, taken in the opposite direction) were also considered as dissimilatory errors (gradient; e.g. a more extreme COG value of /s/ in *sap* *ʃap*). Depending on the direction of the change, assimilatory and dissimilatory errors were labeled as

‘regressive’ (anticipatory, e.g. sap ʃap → ʃap ʃap) or ‘progressive’ (perseveratory, e.g. ʃap sap → ʃap ʃap).

Based on the adopted error metric, on average 18% of speakers’ fluent productions were classified as errors (28% for S1, 27% for S2, 11% for S3, and 9% for S4). Figure 4 plots total numbers of errors for each speaker, broken down by assimilatory, dissimilatory, and exchange errors. It is seen that for all four speakers, assimilatory errors were predominant, followed by dissimilatory errors; exchange errors were rather infrequent or absent altogether.

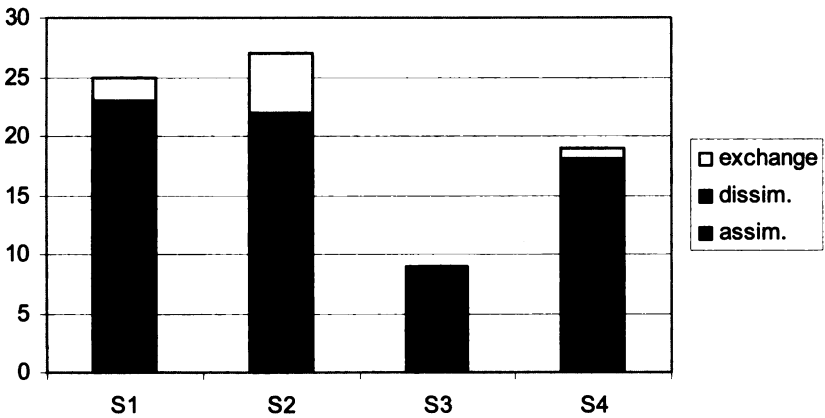


Figure 4. Numbers of errors per speaker (fluent productions), classified by type: assimilatory, dissimilatory, and exchange errors

Figure 5 plots all assimilatory errors (pooled from four speakers), broken down by the acoustic dimension and featural changes. In terms of COG, most errors involved a change from anterior ([+anterior]) to posterior ([-anterior]). In terms of F2, there were more errors involving palatalization ([+back] → [-back]) rather than depalatalization.

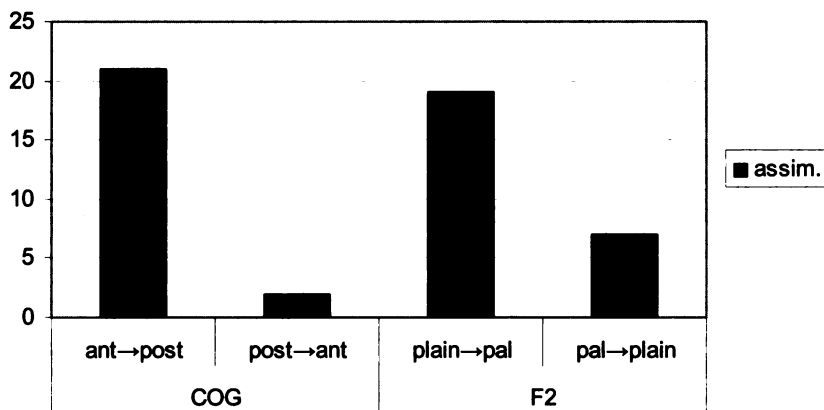
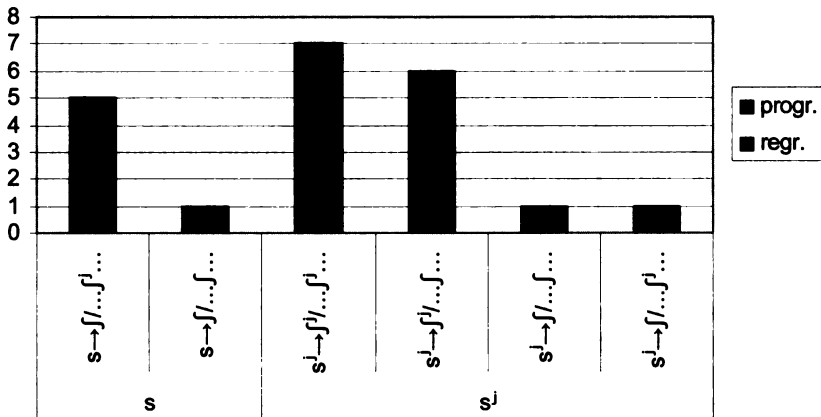
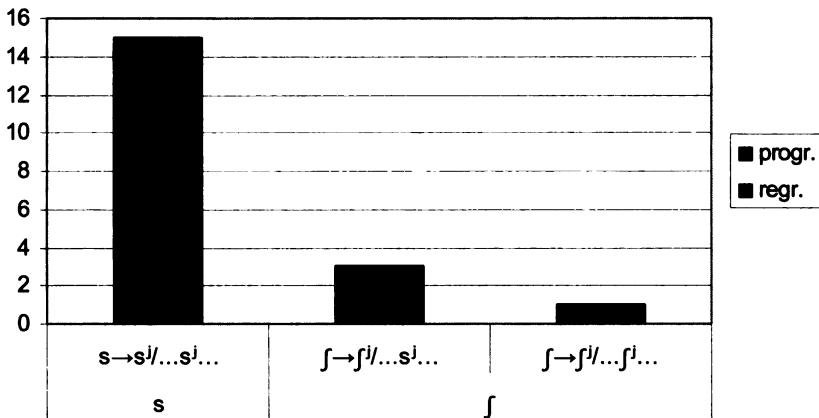


Figure 5. Overall numbers of assimilatory errors (all speakers, fluent productions), classified by the featural change and acoustic parameter

Further exploring the most common changes, [+anterior] → [-anterior] and [+back] → [-back], Figure 6 presents total numbers of errors for each segmental change, broken down by directionality. The first two errors in (a) involve a change of /s/ to [ʃ] before /s/ or /ʃ/; the other four errors involve a change of /s/ to [ʃ] or (less commonly) to [ʒ] before or after /s/ or /ʃ/. The first error in (b) involves a change of /s/ to [sʰ] after or before /s/; the other two errors involve a change of /s/ to [ʃ] after or before /s/ or /ʃ/. It should be noted that /s/ was the most likely target and /ʃ/ was the most likely trigger of primary place errors. In secondary articulation errors, /s/ was the most likely target and /s/ was the most likely trigger. Whether targets and triggers agree or disagree in secondary articulation does not seem to have had an effect, since errors involving both types seemed to be equally frequent. Finally, most primary place errors were regressive (anticipatory), while most secondary articulation errors were progressive (perseveratory).



a.



b.

Figure 6. Anterior → posterior (a) and nonpalatalized → palatalized (b) errors (all speakers), classified by the segmental change and directionality

Like assimilatory errors, category-changing dissimilatory errors in COG involved changes of anterior /s/ and /sʲ/ to posterior /ʃ/ or /ʃʲ/ (e.g. sap sʲap → ʃap sʲap). (Note, however, that the former error may be interpreted as assimilatory, as both output fricatives have some kind of a

posterior constriction.) Unlike assimilatory errors, category-changing dissimilatory errors in F2 were mostly depalatalizing ($s^jap \text{ } \overset{j}{ap} \rightarrow sap \text{ } \overset{j}{ap}$). Gradient dissimilatory errors tended to increase F2 of palatalized fricatives, thus enhancing the contrast in secondary articulation. Three quarters of dissimilatory errors were regressive.

Most exchange (metathesis-like) errors involved consonants that disagreed in secondary articulation (either agreeing or disagreeing in primary place, e.g. $s^jap \text{ } sap \rightarrow sap \text{ } s^jap$, $\overset{j}{ap} \text{ } sap \rightarrow s^jap \text{ } \overset{j}{ap}$).

3.4 Discussion

The results of the experiment support the general predictions that most productions would be error-free and most errors would be assimilatory (harmonic).⁴ The prediction about targets and triggers of assimilatory errors in primary place have also been supported. Indeed, [+anterior] fricatives were the primary targets and [-anterior] fricatives were the primary triggers. As expected, errors in primary place were predominantly regressive (anticipatory). However, the prediction that more similar consonants (agreeing in secondary articulation) would be more likely to participate in errors did not receive consistent support. It appears that featural similarity can be influenced, or even overridden by phonetic, gestural properties of segments, such as the relative dynamic instability of /s/ and /s^j/.

As expected, assimilatory errors in secondary articulation patterned differently from primary place errors. Both features were affected in such errors, with [-back] being a more likely trigger (palatalization). Interestingly, these errors were predominantly progressive, unlike the predominantly regressive errors in primary place. This points to some possible parallels between palatalization errors and palatal vowel harmony and suggests that palatalization errors may have an inherently different mechanism, perhaps involving feature spreading rather than feature correspondence (cf. Gafos 1999; Ní Chiosáin & Padgett 2001).⁵ Caution, however, should be taken when discussing directionality under current experimental conditions, since contextual effects within a given repetition of an utterance could have been confounded by contextual effects of preceding or following repetitions. This question, therefore, merits further research.

⁴ It should be noted that dissimilatory errors were not uncommon, at least for three of the four speakers. This result did not fully follow from the predictions.

⁵ Our preliminary examination of formant values of vowels in tokens with palatalization errors, however, did not provide consistent evidence for the spreading alternative.

Finally, the prediction about the phonetic realization of errors – gradient/partial or categorical/complete was also supported, for both primary place and secondary articulation errors.

It should be noted that other factors may have influenced the speakers' performance, among which are relative phoneme frequency, lexical neighbourhood, patterning of the segments in alternations, and influence of stress.⁶ Possible effects of these factors are currently under investigation.

4 General Discussion

The findings of our speech error experiment are consistent with results of studies of speech errors in English. Recall that these studies also showed some asymmetries in participating features and directionality (Stemberger 1991; Frisch 1996). The findings are also in line with the growing body of work reporting frequent gradient realizations of speech errors (Mowrey & MacKay 1990; Frisch & Wright 2002; Pouplier & Goldstein 2005; Goldrick & Blumstein 2006; Goldstein et al. 2007).

Most important, the patterns of errors are similar to those observed in languages with phonological consonant harmony (e.g. Sarcee). This supports the hypothesized link between consonant harmony and speech production (cf. Walker 2007 on experimental evidence for nasal consonant harmony). These findings suggest that while consonant harmony in languages like Russian is not manifested phonologically, it may become active under certain conditions, triggered by difficulties in planning and implementing similar consonants.

Interestingly, further evidence for the 'latent status' of consonant harmony in Russian comes from sporadic harmonization found in Russian sound changes, loanword adaptation, and dialect formations, as shown in (8) (based on Vasmer 1986-87). These changes involve long-distance assimilation of sibilants in place, mainly regressive assimilation of anterior sibilants to posterior ones.

⁶ An examination of vowel duration showed that, although the speakers produced utterances with both syllables stressed, the primary stress tended to fall on the second syllable (as manifested by longer vowel duration). There were, however, instances of errors in utterances whose syllables did not show stress differences.

- (8) a. s...ʃ → ʃ...ʃ šeršen' 'hornet'
 (< Old Russian сѣршенъ; cf. Slovak sršeň)
 šubaš 'head of police'
 (< Turkish subaşı; cf. Romanian subașă)
 šaška 'sword'
 (< Circassian/Kabardian sešxo)
- b. ʃ...s → ʃ...ʃ šaša dial. 'highway'
 (< French *chaussée*; cf. Standard Russian šosse)
- c. s...tʃ → ʃ...tʃ šmorček dial. 'shorty'
 (< smorček, cf. Standard Russian smorček)
 šljača dial. 'slush'
 (< sljača, cf. Standard Russian sljakot')

5 Conclusion

In this paper we investigated the hypothetical relation between the phonological mechanism of consonant harmony as Agreement by Correspondence and errors in speech production and planning (Hansson 2001; Rose & Walker 2004). The results of the experiment where four Russian speakers produced utterances with various combinations of sibilant fricatives showed that speech errors with fricatives were indeed characterized by some segmental and directionality asymmetries typical of patterns of sibilant harmony. The findings of the study, therefore, provide support for the functional grounding of the mechanism of consonant harmony in difficulties of speech production and planning, while raising some new questions for further research.

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Licensing Modality in Infinitival Structures^{*}

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1 Introductory remarks

Infinitives can mean more than their lexical entry suggests. Surprisingly, even though they are non-finite, infinitives can express tense, in contrast to the other non-finite verbal category, the gerund (Stowell 1982, Pires 2006). Furthermore, infinitives are known to be able to carry some sort of modal reading (Bhatt 1999 *inter alia*), but not in all structures.

Syntactic approaches to tense and modality prompted the view that the "additional" semantic input of the infinitive is somehow related to a position in the structure where quantificational or scopal effects can be realized, i.e. the CP.

In this paper I reexamine the role of the CP in the semantics of the Infinitive by using data from a different language (Russian), and a broader range of structures than has been previously discussed for English, namely, matrix questions, declaratives and imperatives, as well as embedded infinitival purpose and relative clauses, and, finally, subjunctive infinitives.

The findings reveal a strong correlation between syntactic structure and the type of modality expressed by the infinitive. It is proposed that the presence of C plays an important role in licensing infinitival modality, but the source of the modality is the infinitive itself.

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1.1 Infinitival tense: Stowell (1982)

In his seminal paper, Stowell (1982) established a correlation between the "tensed" reading of the infinitive and the presence of a CP. Examples (1a-c, 2a-c), from Stowell (1982), are Control structures and infinitival relative clauses, and, thus, must have a CP (Stowell's CP-infinitives). They are reported to have a "possible Future" reading (also called "unrealized" Tense).

- (1) a. I wonder where to go.
b. We talked about what to do.
c. The table on which to put your coat is in the next room.
- (2) a. The city to visit is Paris.
b. Jenny remembered to bring the wine.
c. Jim reminded Jenny to lock the door.

On the other hand, in the absence of a CP, an independent Tense construal is not available. This is illustrated by examples (3a-c), which are ECM, Raising, and Infinitival Subject structures, respectively (Stowell's IP-infinitives).

- (3) a. Jane showed the solution to be trivial.
b. John appears to like poker.
c. To lock the door was stupid (of me).

The interpretational contrast between CP- and IP-infinitives is explained by Stowell in the following fashion: in order to be interpreted the Tense operator (presumably inherent to any verb) must take scope over the proposition (a clause, in syntactic terms); the landing site for this movement must be a CP; in the absence of a CP, the Tense operator cannot take scope (is "suppressed"), and no tense construal is possible.¹

1.2 Infinitival modality: Bhatt (1999)

By studying modality in infinitival structures, Bhatt (1999) arrived at a similar conclusion, namely, that availability of a modal interpretation depends on the syntactic structure. Examples and paraphrases in (4a-c),

¹ It is not clear how exactly the "suppression" of an operator occurs. We must assume that if the Tense operator cannot take scope overtly it applies vacuously.

from Bhatt (1999), suggest that infinitival Wh complements, non-subject infinitival relatives, and purpose infinitives carry "covert modality". Note that covert modality may have different realizations (deontic or circumstantial) and varying modal force, depending on the context.

- (4) a. Tim knows how to solve the problem.
 (= *Tim knows how one/he could/should solve the problem*)
 b. Jane found a book to draw cartoons in for Sara.
 (= *Jane found a book for Sara one could/should draw cartoons in*)
 c. Sue went to Torino to buy a violin.
 (= *Sue went to Torino so that she could buy a violin*)

According to Bhatt, the source of infinitival Modality in the above structures is C^{+WH} . In structures that lack C^{+WH} modal interpretation may or may not be available. Compare examples (4a-c) to Bhatt's examples of subject infinitival relatives (5a, b).

- (5) a. The man to fix the sink is here.
 b. The first man to walk on the moon visited my school yesterday.

Clearly, (5a) has a different type of modality than the root modal readings exhibited in (4a-c), and the restricted relative in (5b) has no modal interpretation at all. Bhatt assumes that infinitival subject relatives in English are "reduced relatives", i.e. they lack a CP. He proposes that covert modality, with a range of possible root modal interpretations, is only available with a C^{+WH} , and that subject infinitivals (reduced relatives) cannot have any root modal readings due to a lack of C^{+WH} .

Thus, Bhatt's approach to "covert modality" is essentially compatible with Stowell's account of "unrealized tense".

1.3 Goals and methods

The goal of this paper is two-fold. First, we need to determine whether the CP plays a role in the semantics of infinitival clauses in Russian.

Second, we want to find out whether the source of infinitival modality is the C^{+WH} (Bhattian view), or the infinitive *per se* (Stowellian approach²).

To achieve the first, empirical, goal I will examine a number of infinitival structures in Russian, and observe whether the correlation between the presence of CP and modality is robust. If the correlation is absolute, we expect the following statements to be true:

- 1) Modal interpretation of an infinitive is not possible without a CP.
- 2) It is impossible *not* to have a modal interpretation in a CP infinitival clause.

Whether this proves to be true or not is an empirical issue, and will be discussed together with the data.

Using Russian data allows us to distinguish between the two theoretical proposals about the source of tense/modality in infinitival clauses. Russian has a number of infinitive constructions that are specific to Slavic, and are not available in English. They can be covered by an umbrella term "dative-infinitive" structures, and include matrix questions, declaratives, imperatives, subjunctive infinitives, infinitival purpose clauses, and infinitival relatives. Since the range of these infinitival structures in Russian is broader than in English, and includes CP structures with and without [+wh] feature, it is possible to test whether Bhatt's or Stowell's proposal is better suited to handle cross-linguistic data.

2 Dative-Infinitive (DI) structures in Russian³

DI structures, sometimes called "main clause infinitives", present an interesting testing ground for the syntax-based account of infinitival modality. Semantically, they have been described as having an unspecified modal component (Shvedova 1980), usually a root modal

² Although Stowell (1982) does not discuss modality in his paper, his approach is easily extended to include a Modal operator. Further on, I will refer to Stowell's proposal in this broader sense, as applying to both infinitival tense and modality.

³ There is a considerable body of work devoted to these structures in the Generative framework, namely, Greenberg and Franks (1991), Schoorlemmer (1993), Kondrashova (1994, 2007), Komar (1999), Babby (2000), Moore & Perlmutter (2000), Perlmutter & Moore (2002), Sigurdsson (2002), Fleisher (2006). The majority of these papers are concerned with syntactic issues and do not address modality in DIs and its source. Currently, there is no consensus about the internal syntactic structure of DIs.

reading of varying force. Syntactically, they qualify as "infinitival" structures, since their main verb is always an infinitive. They have a number of other interesting properties, the topmost of which is the fact that the thematic subject of the infinitive in these structures is always marked with a Dative case (hence the descriptive label "dative-infinitive"). The subject argument may be omitted, as is common in Russian; for such cases I assume these structures to have a Dative-marked *pro*.

2.1 DIs in basic clause types and their interpretation

DI structures are pervasive in Russian grammar and are used in all basic clause types: declarative, interrogative, and imperative, as illustrated below.

2.1.1 Declaratives

- (6) a. Kole zavtra rabotat'.
 Kolja_{DAT} tomorrow work_{INF}
 'Kolja has to work tomorrow.'
 b. Gruzoviku zdes' budet ne proexat'.
 truck_{DAT} here be_{FUT} Neg drive_{INF}
 'A truck won't be able to get through here.'

Declarative DIs have been noted for the presence of a root modal interpretation (possibility, necessity, etc.), which is shown in the English translation of (6a,b).

2.1.2 Interrogatives

- (7) a. Kak nam reshiti' zadachu?
 how we_{DAT} solve_{INF} problem_{ACC}
 'How can/should we solve the problem?'
 b. S kem Mashe druzhit'?
 with who Masha_{DAT} befriend_{INF}
 'Who can/should Masha be friends with?'
- (8) a. Mne vzjat' zontik?
 me_{DAT} take_{INF} umbrella-A
 'Should I take an umbrella?'

- b. Poexat' chto li v Kanadu?
 go_{INF} Q-part to Canada
 'Maybe I/we should go to Canada?'
- c. Ne pozvat' li nam ix v gosti?
 Neg invite_{INF} Q we_{DAT} they_{ACC} in guests
 'Maybe we should invite them to visit/for dinner?'

Interrogative DIs can be used as Wh-questions (7a,b), as well as yes/no questions (8a-c). In both cases the modal component is clearly present, as is seen from the translations.

2.1.3 Imperatives:

- (9) a. Vsem vstat!
 all_{DAT} stand-up_{INF}
 'Everyone stand up!'
- b. Ne kurit!
 Neg smoke_{INF}
 'No smoking.'
- c. Rukovoditeljam otdelov srochno javit'sja v kabinet direktora.
 heads_{DAT} departments_{GEN} urgently come_{INF} in office director_{GEN}
 'Heads of the Departments report to Director's office immediately.'

The interpretation of imperative DIs (9a-c) is significantly different from that of declaratives and interrogatives. Although it could be argued that the notion of "imperativity" involves modality in a broad sense, it is clear that this type of modality is not the same as the root modal readings of examples (6, 7, and 8). Whereas declaratives and interrogatives may express *necessity*, imperatives express *direct commands*. For example, (9a) does not mean 'it is necessary for everybody to stand up', nor does it mean 'everybody has a moral obligation to stand up'. Although direct commands can *entail* necessity or moral obligation, they do not have such meanings (for a technical account of the distinction between imperative and root modal semantics see Portner (2007)⁴). I conclude that imperative DIs do not have root modal interpretations.

⁴ In Portner (2007) the parallel between the range of readings available for imperatives and root modal expressions is established via the To-Do List discourse semantics (see

2.2 CP-infinitives vs. C-less infinitival clauses

As has been shown in the previous section, DI structures do not always have root modal readings. A question arises whether this interpretational distinction is matched by a syntactic difference, and, more specifically, whether the presence of a CP correlates with availability of root modal readings.

To answer these questions, let us look at several more structures with DI clauses, namely, clausal subjects, purpose clauses, infinitival relatives, and, finally, "cursing" DIs. As a starting point, however, let us compare the structures of declarative, interrogative and imperative DIs.

2.2.1 Imperatives

Both interrogative and declarative DIs, occur in embedded contexts, as is shown in (10a, b). This means that they have a full-fledged syntactic structure with a CP.

- (10) a. Tim sprosil, kak (emu) reshit' zadachu.
 Tim asked how he_{DAT} solve_{INF} problem_{ACC}
 'Tim asked how to solve the problem.'
- b. Masha skazala, chto Kole zavtra rabotat'.
 Masha said that Kolja_{DAT} tomorrow work_{INF}
 'Masha said that Kolja has to work tomorrow.'

In contrast, imperative DIs cannot be embedded with an overt complementizer. Example (11) denotes a reported speech, and not a command, suggesting that imperatives do not have a CP.

- (11) # Masha skazala, chto vsem vstat'.
 Masha said that all_{DAT} stand-up_{INF}
 # 'Masha said that everyone stand up.'
 (*intended*: 'Masha told everyone to stand up.')

Thus, interrogative and declarative DIs have a CP in their structure, and their infinitives also have root modal readings. Imperative DIs are

also Portner 2004). On this approach, both root modals and imperatives add to the To-Do List (both having a performative function), but while imperatives have no other function, modals also play a role in truth-conditional semantics and introduce a modal operator.

likely to have no CP in the structure, and they lack a root modal component in their interpretation.

2.2.2 Clausal subject DIs

Infinitival subjects in Russian are a complex group. DI subjects can be *headless* and *headed*, as shown in (12a, b).

- (12) a. $IP[Kole\ bol'she\ ne\ pit'\ shampanskogo]$ oznachalo smert'.
 Kolja_{DAT} anymore Neg drink_{INF} champagne_{GEN} meant death
 'For Kolja not to drink champagne anymore meant death.'
- b. To, $CP[chto\ IP[Kole\ bol'she\ ne\ pit'\ shampanskogo]]$ znali vse.
 Rel_{head} that Kolja_{DAT} anymore Neg drink_{INF} champagne_{GEN}
 knew all
 'The fact that Kolja was not to drink champagne anymore was known to everyone.'

I assume a relative-clause-like structure for (12b), headed by a determiner *to* with the relative complementizer *chto*. Headed DI subjects clearly have a CP, and their interpretation has a modal component, as shown in translation of (12b). I take headless DI subjects (12a) to be without a CP⁵ (analogous to Bhatt's (1999) reduced subject relatives). Importantly, (12a) does not carry the modal reading, and, therefore, the interpretational contrast between these cases is matched by a difference in the structure.

2.2.3 Purpose clauses and Infinitival relatives

Let us start with DI structures that have overt complementizers. Purpose clauses in Russian use a subjunctive complementizer *chtoby*; examples (13a, b). The same complementizer *chtoby* can sometimes be used in relative clauses with *instrumental-purpose* reading.⁶ The two syntactic structures produce two distinct readings, given in italics.

⁵ That the subject clause of headless DI subjects is likely to be an IP is suggested by the deteriorated status of interrogatives, as in (i), where Wh-movement to the clause-internal CP is not available.

(i) *? [Chego_i $IP[Kole\ bol'she\ ne\ pit'\ t_i]$] oznachalo smert'?'
 what Kolja_{DAT} anymore Neg drink_{INF} meant death

⁶ It must be said that instrumental-purpose interpretation is associated with two constructions in Russian: relative clause, and the preposition *dlya* 'for' with a deverbal

- (13) a. Kolja kupil aparat **chtoby** (samomu) merit' (sebe) davlenie.
 Koljabought device **Comp** himself_{DAT} measure_{INF} self_{DAT}
 pressure_{ACC}
Kolja bought a/the device so that he could take his own blood pressure.
Kolja bought a device for taking one's own blood pressure.
- b. Aparat **chtoby** (samomu) merit' (sebe) davlenie prodaetsja v apteke.
 device **Comp** himself_{DAT} measure_{INF} self_{DAT} pressure_{ACC} is sold
 in pharmacy
#A device, so that one could take one's own blood pressure is sold in pharmacies.
A device for taking one's own blood pressure is sold in pharmacies.

Notice that postverbal *chtoby*-clauses (13a) can be syntactically ambiguous between a purpose clause modifying the predicate (VP), and a relative (purpose) clause headed by a noun (the complement of the verb). In a preverbal position (13b), the DI can only be a subject relative, and, therefore, the modal reading associated with the purpose clause is not available.

Although both purpose clauses and relatives apparently have a CP, there is a noticeable difference in the way modality is realized in these structures. DIs in purpose clauses have the same type of modality that is present in matrix DI sentences. On the other hand, relative DI clauses do not have a root modal interpretation, as seen from (13b), which has an *instrumental-purpose* reading.

2.2.4 Infinitival relatives

Next, consider *bare* infinitivals (14a,b). These structures do not have overt complementizers, and they also lack overt Dative subjects. I

noun. The difference in usage between the two is mostly stylistic. Thus, *apparat dlja izmerenija davlenija* 'device for measuring pressure' is more common than *apparat chtoby merit' davlenie* 'device to measure pressure'. However, since P+noun construction is more formal, in colloquial contexts the relative structure is preferred, cf. *kovshik chtoby nabirat' vodu* 'pitcher to scoop water with' vs. *kovshik dlja nabiranija vody* 'pitcher for scooping water'.

assume that these are truly *reduced* relatives, and not DI structures, where a Dative argument may be dropped, but can always be made overt.

The example (14a) is parallel to (13a) in that it is syntactically ambiguous between predicate-modifying purpose clause and an infinitival relative. Notice, however, that the interpretation of (14a) does not include the root modal reading, it is a *purpose* reading devoid of necessity or ability. The subject relative example (14b) obviously does not have the purpose reading, and is somewhat degraded compared to (13b). The reason for this is not quite clear,⁷ and I will not address it further, since it is not directly relevant to the present discussion. What is important is that the two structures give rise to two familiar interpretations: the *purpose* reading, and the *instrumental-purpose* reading. In this case, however, the *purpose* reading is curiously weakened: it does not have the "ability" component typical of the root modal interpretations, as seen from the translation paraphrases of (14b).

- (14) a. Kolja kupil apparat merit' davlenie.
 Kolja bought device measure_{INF} pressure_{ACC}
Kolja bought a/the device in order to take blood pressure.
 ?? *Kolja bought a device for taking blood pressure.*
- b. ? Apparat merit' davlenie prodaetsja v apteke.
 device measure_{INF} pressure_{ACC} is sold in pharmacy
 * *A device, in order to take blood pressure is sold in pharmacies.*
 ? *A device for taking blood pressure is sold in pharmacies.*

Assuming that bare infinitivals do not have a CP, it is not surprising that they lack the root modal readings of the CP purpose clauses. Interestingly, Russian subject relatives seem to lack the root modal interpretation, regardless of whether they have a CP (13b) or not (14b).

2.2.5 Cursing and Wishing infinitives

DI structures can be used with a subjunctive complementizer to make curses (15a-c) and (more rarely) good wishes (15d). I regard these as having not a root modal interpretation, but rather something like a *future*

⁷ It seems that Russian does not "like" reduced relatives. They can be more acceptable in colloquial speech, however. I can imagine (14b) used in informal spoken Russian, but not in writing.

subjunctive reading, 'may' in the translation clearly not meaning a permission.

- (15) a. Chtob im vsem provalit'sja!
 Comp they_{DAT} all_{DAT} fall-through_{INF}
 'May they all disappear!' = *I wish they may all go to hell!*
- b. Chtob tebe zhit' na odnu zarplatu!
 Comp you_{DAT} live_{INF} on one salary
 'May you live on one salary!' = *May salary be your only income!*
- c. Chtob etim banditam vek svobody ne vidat!
 Comp these_{DAT} bandits_{DAT} century freedom Neg see_{INF}
 'May these bandits not see freedom for a hundred years!'
- d. Chtob vam sto let zhit'!
 Comp you_{DAT} hundred years live_{INF}
 'May you live a hundred years!' = *I wish you live a hundred years!*

The syntactic status of Cursing infinitives is unclear. On the one hand, they have an overt complementizer *chtob* which is expected to be in C; on the other hand, they fail to appear in embedded contexts, as shown in (16a). It might be a selection issue, but it is more likely that they are like exclamatory sentences (16b). Whatever prevents exclamations to be embedded must be responsible for the same behavior of Cursing infinitives.⁸

- (16) a. # Masha pozhelala/ xotela, (chto) chtob im vsem provalit'sja!
 Masha wished / wanted (that) Comp they_{DAT} all_{DAT} fall-through_{INF}
 (*intended*: 'Masha wished/wanted all of them to go to hell.')
- b. # Mary exclaimed/appreciated what a nice day!

Assuming that Cursing infinitives do have a CP, we have a case where a CP-infinitival does not have a modal component.

⁸ It is possible that a yet unknown discourse semantic prohibition prevents Cursing infinitives from being embedded under an overt complementizer.

2. 3 *Summarizing the Russian facts*

In the range of the examined structures in Russian, none of the Infinitival structures without a CP has a root modal component. This is demonstrated in two DI structures: Imperatives and headless Infinitival subjects; and two bare Infinitivals (non-DI): purpose clauses and relatives. This establishes the first part of the empirical correlation: no root modal interpretation is attested without a CP.

On the other hand, infinitival structures with a CP may or may not have root modal semantics. CP-structures that have a root modal component are: DI interrogatives, DI declaratives, headed DI infinitival subjects, and DI purpose clauses. Subject DI relatives and Cursing DIs do not have root modal interpretations. Judgments on object DI relatives are less straightforward due to the structural ambiguity between object relatives and purpose clauses, but I think the evidence is pointing towards the absence of the root modal component. I conclude that the second part of the empirical correlation is not strict: a CP-infinitive can have a root modal interpretation, but does not have to.

3 Discussion

The findings across Russian structures differ from Bhatt's (1999) observations concerning English data in two ways. First, in contrast to Russian, reduced relatives (subject infinitivals) in English can have a modal interpretation, although of a different type. Second, there are structures in Russian that fail to produce a root modal reading, despite the presence of a CP (Cursing infinitives).

The first distinction may be partially due to a terminological mix up. In the present paper I limit the discussion to root modal (in the sense of Portner (2007)) readings that are lexically expressed by 'can', 'must', 'should' in English. Thus, I make a distinction between *root modal* and *purpose* readings (which can be lexically rendered as 'in order to'). It is possible that what I call a *purpose* reading without a root modal component is, in fact, Bhatt's "different modal" reading of the infinitival subject relative. If this is the case, then English and Russian data on subject relatives are quite similar.

However, there is no denying that bare infinitival relatives have a somewhat different semantic distribution in the two languages. Compare

Bhatt's examples (5a,b), repeated here as (17a,b), with their Russian translations (18a,b).

(17) a. The man to fix the sink is here. (+modal)

b. The first man to walk on the moon visited my school yesterday. (-modal)

(18)a. # * Chelovek pochinjat' rakovinu - zdes'.

man_{NOM} repair_{INF} sink_{ACC} here

b. **Pervyj chelovek xodit' / poxodit' po lune vchera byl v nashej shkole.
first man_{NOM} walk_{INFimp} walk_{INFperf} on moon yesterday was in our school

Russian seems to have no *purpose* reading of relatives, instead, it has the *instrumental-purpose* reading, which can be paraphrased as 'intended for'. This is the most likely reason for the deteriorated status of (18a), and, more generally, a tendency to use inanimate nouns as heads in Russian (compare 18a with 14b). In addition, Russian does not allow restricted relative usage of the infinitive, so, for example, there are no Russian equivalents to such English phrases as 'a book to read', 'something to remember', 'the last person to ask'. Thus, (18b) is uninterpretable bad, since both restrictions are violated there.

Remarkably, the Russian data suggest that there is not much difference semantically between relative clauses with or without an overt complementizer. I take this as an invitation to rethink Bhatt's idea that the interpretational difference between Subject and Object relatives (in both cases bare infinitivals) lies in the difference in the structure of the relative clause, Subject relatives being reduced. I think that the difference in the readings may stem from a different structural distinction, namely, a structural ambiguity of infinitival objects between relative vs. purpose clauses. If the semantics is tweaked to exclude the purpose clause reading of the post verbal infinitive, then the infinitival relative has the same interpretation in subject and object positions. Compare, e.g., restrictive relatives in (19a) and (19b); and (19c) and (19d).

(19) a. The first man to walk on the moon visited my school yesterday.

b. Yesterday, I met the first man to walk on the moon.

- c. The man to fix the sink was two hours late.
- d. ?We paid the man to fix the sink after the job was done.

Having said this, it is still unclear why CP infinitival relatives fail to produce the root modal interpretation (at least in Russian). It appears that the presence of a CP is a necessary, but not sufficient condition for licensing infinitival modality.

4 Proposal

According to Bhatt (1999), the source of modality in infinitival clauses is C^{+WH} , and what I call the purpose reading is produced by the infinitive *per se*. I want to maintain this distinction, but I do not agree that C^{+WH} is the source of infinitival modality for at least two reasons. First, the main clause DI structures have a strong modal component irrespective of whether they have a C^{+WH} , as in interrogative DIs, or not, as in declarative DIs. Second, non-infinitival questions do not have modal interpretations without a lexical modal, but they must have a C^{+WH} . In both cases, the projection itself cannot be the source of modality, and the feature [+wh] must be responsible for questions and relative clause movement, but not for modal operator raising.

Therefore, I propose a view that is closer to Stowell's (1982) approach. I think that the infinitive *potentially* carries a Tense and Modal operator, in other words, it has an "unrealized" tense and "covert" modality, and, in addition, the purpose meaning as well. Both tense and modal operators need to take scope over the proposition, but can do so only if a CP is available as a landing site for the respective operator. In the absence of a CP both tense and modality are unrealized. The purpose reading may be lexically inherent to the infinitive and is not realized through an operator movement. As a result, the purpose reading is available in those structures that lack a CP, and, thus, the structural/interpretational correlation is maintained.

Now let us look at the cases where no modality is expressed, despite the presence of a CP. If we allow that an operator can be unrealized (as we do in case of a lack of a CP), then it follows that it may still be prevented from taking scope even if a CP is available. For Cursing infinitivals, modality may be semantically incompatible with the construction (as is the case with exclamations and imperatives), since

there is no proposition to take scope over. In the case of infinitival relatives, since they are incomplete propositions, the operator must take scope over a higher clause, but the operator raising will be prevented by Subjacency.

5 Conclusions

Extending the Stowell-Bhattian approach to the Russian data reveals a strong cross-linguistic similarity in the semantics of infinitival structures. The Russian data are consistent with the original observation that the interpretational contrast found in various types of Infinitivals with respect to Modality correlates with a difference in syntactic structure.

By observing a broader range of structures in Russian, both with and without a C projection, we presented evidence in favor of the original Stowell's idea that the infinitive *per se* can be the source of tense and modality in infinitival structures.

Based on these findings the following claims are made:

- 1) Infinitives carry both unrealized Tense and Modality as part of their semantics.
- 2) Semantic interpretation of "unrealized" Tense and Modality is licensed by an operator movement to C.

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On Two Types of Wackernagel Cliticization in Slavic*

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1 Introduction

Slavic languages display a contrast with respect to two cliticization patterns. On the one hand, Bulgarian and Macedonian have verb-adjacent clitics, on a par with many Romance languages. On the other hand, other Slavic languages with clitics have Wackernagel clitics, which appear after the first constituent. This constituent can be of any category, a head or a phrase; what matters is that it is syntactically mobile. For example, Serbo-Croatian speakers who do not permit conjunct extraction in coordinate structures do not allow clitics after the first conjunct, either.

- (1) a. *Sestra i njen muž će mi ga pokloniti*
sister and her husband will m_{EDAT} it_{ACC} give
'My sister and her husband will give it to me.'
b. **Sestra će mi ga i njen muž pokloniti* (Progovac 1996: 419)

In spite of their uniform placement after the first syntactic unit, second position clitics do not target a designated position in the structure. This is what Bošković (2001) concludes on the basis of potential interpretations of certain adverbs, such as *pravilno* 'correctly' in Serbo-Croatian. This adverb is ambiguous and may have both a sentential and a manner reading in clauses that contain an auxiliary clitic (cf. 2a). If the auxiliary clitic is accompanied by a pronominal clitic, only the manner

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interpretation of the adverb is possible (cf. 2b). Following the standard idea that sentential adverbs are located higher in the structure than manner adverbs, Bošković claims that this means that the auxiliary clitic *su* moves higher when it occurs on its own than when it co-occurs with the pronominal clitic.

- (2) a. Oni *su* pravilno odgovorili Mileni.
 they be_{AUX.3PL} correctly answer_{PART.M.PL} Milena_{DAT}
 ‘They did the right thing in answering Milena.’
 ‘They gave Milena a correct answer.’
- b. Oni *su* joj pravilno odgovorili
 they be_{AUX.3PL} her_{CL.DAT} correctly answer_{PART.M.PL}
 ‘*They did the right thing in answering her.’
 ‘They gave her a correct answer.’ (S-C, Bošković 2001: 39)

This paper will analyze the distribution of Wackernagel clitics in Slavic. It will argue that they do not form a natural class, and that there are two distinct types of Wackernagel cliticization: generalized Wackernagel cliticization, which applies to pronominal and auxiliary clitics and is illustrated in (1) and (2), and operator cliticization, which is found across Slavic and is not limited to the languages with generalized Wackernagel cliticization. Evidence for this distinction will come from the diachronic patterns of cliticization in Old Church Slavonic and the way they evolved in Slavic, which will be described in sections 2 and 3. The paper will also show that operator cliticization may have distinct requirements concerning the syntactic and categorial status of its host (sections 4.1 and 4.2, respectively), and that operator clitics target the second position regardless of whether a language has other Wackernagel clitics (section 4.3). The paper will conclude in section 5 with some remarks on the currently prevalent analyses of cliticization, showing that the mechanism of operator cliticization correspond to the way V2 evolved in Germanic.

2 Diachronic evidence

The traditional claim about cliticization pattern in Old Church Slavonic is that clitics “stand after the first full word of a clause” (Lunt 1974: 65). However, detailed corpus studies (see Radanović-Kocić (1988: 151)) indicate that that only three clitics uniformly occur in the Wackernagel position: the interrogative particle *li*, the complementizer *bo* ‘because’,

and focus particle *že*. They all specify the Illocutionary Force of a clause, and I will term them operator clitics.

- (3) a. Ašte *li* oko tvoe lōkavo bōdetū.
if Q eye your evil be_{PRES.SG.N}
'If your eye should be evil.' (Radanović-Kocić 1988: 151)
- b. I *že* *bo* sę sʔmērītʔ ěko otročę se.
he^{+FOC} because REFL humble_{FUT} like child this
'For who humbles himself like this child.'
(Pancheva et al 2007b)
- c. Elisaveti *že* isplʔni sę vrēmę roditi *ei*.
Elizabeth FOC fulfil_{PAST} REFL time give-birth her_{DAT}
'When it was time for Elizabeth to have her baby.'
(Pancheva et al 2007a)

Pronominal clitics are usually postverbal, as shown for the reflexive accusative clitic *se* and the dative clitic *ei* in (3c). In some cases clitic placement depends on the semantics of the clitic host. For instance, the conditional auxiliary clitic *by/bi* is always right adjacent to the complementizer *a*, so an adverb such as *sʔde* may only follow the clitic (cf. 4). Conversely, *by/bi* need not be adjacent to the complementizer *da*, as in (5), where negation may intervene between the two elements.

- (4) a. A *by* bylʔ sʔde.
if COND.3SG be_{PART.M.SG} here
'If he had been here.'
- b. A *by* sʔde bylʔ. (OCS, Vaillant 1977: 219)
- (5) Dgʔzaaxǔ *i* da [ne *bi*]/[*bi* ne]
held_{3PL} him that NEG COND.3SG NEG
otʔšelʔ otʔ nixʔ.
leave_{PART.M.SG} from them
'And they held him, so that he would not leave them'
(OCS, Willis 2000: 330)

According to Willis (2000: 330), the contrast is related to the semantics of the complementizers: *a*, which obligatorily attracts the clitic, introduces conditional clauses, whereas *da*, which does not require clitic adjacency, introduces declarative (indicative) clauses.

In some Slavic languages (Serbo-Croatian, Burgenland Croatian, Slovene, Czech, and Slovak), pronominal and auxiliary clitics appear in the second position. According to Radanović-Kocić (1988), who investigates Old Serbian, Wackernagel cliticization was generalized into non-operator clitics gradually. Pronominal clitics began to appear in the second position after the 15th century, in the presence of operator clitics (cf. 6a), or independently (cf. 6b). The process was very slow, because examples of clitics that do not appear in the second position and do not cluster are found as late as in the 19th-century texts (cf. 6c).¹

- (6) a. Kto *li ga ime taiti.*
 who Q him_{ACC} have_{3SG} hide_{INF}
 ‘Who will be hiding him?’ (Radanović-Kocić 1988: 158)
- b. Dokle *mu se ne ispravi.*
 until him_{DAT} REFL NEG correct_{PREP.3SG}
 ‘Until it is corrected (for him).’ (R.-Kocić 1988: 158)
- c. Da *su u ono doba molili se.*
 that be_{AUX.3PL} at that time pray_{PART.M.PL} REFL
 ‘That at that time they prayed.’
 (19th c. Serbian, Radanović-Kocić 1988: 174)

It is difficult to account for the observed diachronic change in purely syntactic terms due to its very gradual nature. I will tentatively assume that it involved a reanalysis of PF requirements of the non-operator clitics. At any rate, what is important for the hypothesis adopted in this paper is that generalized Wackernagel cliticization developed later and independently of operator cliticization.

3 Operator cliticization in modern Slavic languages

The subsequent sections will analyze properties of operator clitics in Slavic. As was noted earlier, they form a natural class by specifying the Illocutionary Force of a clause. Unlike pronominal and auxiliary clitics, they do not have non-clitic counterparts. In the literature they are sometimes termed sentential clitics (cf. Kaisse (1982), Radanović-Kocić (1988)). Since by specifying Force they scope over the entire clause, I use the term “operator clitics”; following Tomić (2001), who draws a

¹ Interestingly, an anonymous reviewer points out that Old Slovene had non-operator Wackernagel clitics already in the 11th century, so much earlier than Serbian.

distinction between operator and non-operator clitics in Macedonian.

Most contemporary Slavic languages have retained the OCS operator clitic *li*. Its Force value varies crosslinguistically, but it usually licenses focus on the preceding element (in Bulgarian, Macedonian, Russian, and Serbo-Croatian, cf. 7) or yes-no questions (in Bulgarian and Serbo-Croatian).

- (7) Niz gardinata *li* šetaše?
 through garden-the Q walked_{2SG}
 ‘Were you walking THROUGH THE GARDEN?’
 (Mac, Rudin et al. 1999: 546)

Modern Polish productively uses *że*, which like *li* in the other languages marks focus on the preceding element.² Bański (2000a: 96) claims that it may also be inserted for PF reasons, to facilitate encliticization of the auxiliary onto the host, as in (8), where the host *Katowic* ends in the affricate [ts], and is not an appropriate host for the clitic *-(e)ś*.

- (8) a. Do Katowic-*że-eś* pojechał?
 to Katowice_{GEN+FOC+AUX.2SG} go_{PART.M.SG}
 ‘You went to Katowice?!’
 b. *Do Katowic-*ś* pojechał? (Pl, Migdalski 2006: 235)

Finally, Serbo-Croatian has an ethical dative operator clitic. Unlike the argumental dative clitic, it does not have a non-clitic counterpart, and it performs a pragmatic “endearing” function. It is discussed in section 4.3.

4 Properties of operator clitics

This section will provide evidence for the distinct status of operator clitics in Slavic on the basis of synchronic evidence. It will show that operator clitics impose specific requirements with respect to the syntactic status of the host (subsection 4.1), the category of the host (subsection 4.2) and that they target a uniform position in the structure, typically

² *Że* is also an indicative complementizer in Modern Polish, but this usage is an innovation. In Old Polish *że* was used only as an enclitic focus marker, whereas *ize* was a complementizer. According to Decaux (1955: 208-209), *że* emerged as a complementizer only in the 16th century, when the initial vowel *i* was lost.

following the initial constituent, irrespectively whether a language has other Wackernagel clitics or not (subsection 4.3).

4.1 Syntactic status of the host

Although pronominal and auxiliary clitics in Serbo-Croatian can be preceded by heads and phrases (cf. 9b), the operator clitic *li* is selective about the syntactic status of its host, and may only follow heads.

- (9) a. Skupe (*li*) knjige (**li*) Ana čita?
 expensive Q books Q Ana reads
 ‘Does Ana read expensive books?’
- b. Skupe (*je*) knjige (*je*) Ana čitala.
 expensive be_{AUX.3SG} books be_{AUX.3SG} Ana read
 ‘Ana read expensive books.’ (S-C, cf. Bošković 2001: 27)

The initial head must be syntactically mobile. If it is not, like the first conjunct in the coordinate structure in (10), *li* may not appear neither after the first head nor the first XP, even if the latter is a syntactic unit.

- (10) Kuću (**li*) i auto (**li*) prodaje?
 house Q and car Q sells
 ‘Is s/he selling the house and the car?’
 (S-C, cf. Bošković 2001: 28)

Bošković (2001: 31ff) explains the restriction on the syntactic form of the host by assuming that *li* in Serbo-Croatian is defective in the sense of not being able to support a specifier. Therefore, the focal feature of *li* may only be checked via head movement.^{3,4} Example (11) indicates that

³ This property is also reflected in verb movement across *li* in Serbo-Croatian. As shown in (i), finite verbs may raise to the position in front of *li*, but *l*-participles may not. The contrast receives a straightforward explanation on the assumption that whereas finite verbs in Serbo-Croatian move via head movement, the *l*-participle undergoes XP movement (cf. Migdalski 2006 ch. 2). The *l*-participle may not adjoin to *li*, because *li* is unable to project a Specifier and host phrasal material.

the same requirement concerning the head status of the *li* host holds for Russian, even though its clitic inventory is severely impoverished, as it does not have any clitics except *li*, the conditional auxiliary *b* and the focus particle *že*. This fact indicates that the restriction on the syntactic status of the host is a characteristic property of operator clitics in some languages, unrelated to patterns of generalized cliticization.

- (11) Doroguju *li* knjigu (**li*) ona kupila?
 expensive Q book Q she buy_{PART.F.SG}
 ‘Did she buy an EXPENSIVE book?’
 (Rus, Rudin, King & Izvorski 1998: 215)

Although in Bulgarian *li* can be preceded by heads or phrases alike (cf. 12), *li* is special as it provides the only context in which Left Branch Extraction is possible in this language.

- (12) a. Novata (*li*) kola (*li*) prodade?
 new-the Q car Q sold
 ‘Was it the new car that he/she/you sold?’
 (Bg, Bošković 2001: 226, 231)

Bošković (2001: 232) observes that the Left Branch Extraction is very local, and it may only originate from the position immediately below *li*.

- (13) *Novata *li* Petko prodade kola?
 new-the Q Petko sold car
 ‘Did Petko sell the new car?’ (Bg, Bošković 2001: 232)

- (i) a. Ljubi *li* nju?
 kiss_{PRES.3SG} Q her
 ‘Does he kiss her?’
 b. *Poljubio *li* je nju?
 kiss_{PART.M.SG} Q be_{AUX.3SG} her
 ‘Did he kiss her?’ (S-C, Bošković 1995: 251)

In Bulgarian, where *li* may be preceded by heads and phrases, both *l*-participles and finite verbs may move across *li*.

⁴ Nataša Milićević (p.c.) and an anonymous reviewer remark that PPs and *wh*-words may precede *li* in Serbo-Croatian, which might be a problem for this generalization.

He explains the locality restriction by suggesting that Left Branch Extraction in Bulgarian always proceeds via X^0 movement, while in the languages with unconstrained Left Branch Extraction (that is in all Slavic languages with some variation, except Bulgarian and Macedonian) XP movement is possible. The derivation of (12a) is sketched in (14).

- (14) $[_{CP} [Novatai+li] [t_i \text{ kola}]_j \text{ prodade } t_j]$
 new Q car sold (Bg, Bošković 2001: 227)

Thus, although Bulgarian differs from Serbo-Croatian in permitting the focal feature of *li* to be checked by either X^0 or XP movement, it displays the same restriction concerning the X^0 status of the host in the environment of Left Branch Extraction. This indicates that operator clitics have uniform requirements even if the languages have different cliticization systems otherwise.

Że, the operator clitic found in Polish, also has specific requirements about the syntactic status of its host. Bański (2000b) claims that it may attach only to phrasal material.⁵ In this way *że* is a host for auxiliary affixes, which are compatible only with heads. This is illustrated for VP fronting in (15), which is possible only in the presence of *że*.

- (15) a. [Przyszli tu] *że-ście* już?⁶
 come_{PART.VIR.PL} here _{FOC⁺AUX.2PL} already
 ‘Have you come here yet?’
 b. *[Przyszli tu]-ście już (Pl, Bański 2000b: 24)

4.2 *Categorial status of the host*

Operator clitics may also display requirements concerning the category of its host. For instance, in Czech, which like Serbo-Croatian has generalized Wackernagel cliticization, *li* may only encliticize on finite verbs (cf. 16a). The examples in (16b) are ungrammatical, because *li* is preceded by a noun or an adverb.

⁵ The exception is the *l*-participle, which undergoes head movement in Polish, but may attach to *że*.

- (i) a. *Przyszli-że-ście* już?
 come_{PART.VIR.PL}+_{FOC⁺AUX.2PL} already
 ‘Have you come yet?’

⁶ Bański marks this sentence as “??”, but for me it is completely acceptable.

- (16) a. *Máte-li* pochyby, zatelefonujte na informace.
 have_{2PL}+Q doubts call_{2PL} at information
 ‘If you have doubts, call the information.’
 b. **Pochyby/ *dnes- li máte...*
 doubts / today Q have_{2PL} (Cz, Toman 1996: 508)

Likewise, in Modern Polish *że* may not attach to non-verbal elements, either. It may only adjoin to a verbal form, either an auxiliary or a lexical verb (cf. 17).⁷ In this way *że* shares its restrictions concerning its host with the operator clitic *li* in Czech, although the cliticization patterns are entirely different in these languages.

- (17) a. *Do Katowic-że-ś* pojechał?
 to Katowice_{GEN}+*FOC*+*AUX.2SG* *gO*_{PART.M.SG}
 ‘You went to Katowice?!’
 b. **Do Katowic-że pojechał-eś?*
 (Pl)

4.3 Position in the structure

In contrast to pronominal and auxiliary clitics, which do not target a designated position in the structure (cf. 2), *li* has traditionally been assumed to be in C (cf. Rudin 1986, Rivero 1994). It is difficult to examine the position of *li* in Serbo-Croatian using the test related to the interpretation of adverbs as in (2), because sentential adverbs are incompatible with questions. However, Serbo-Croatian has another kind of operator clitic, which is the ethical dative. It has a pragmatic function of attracting the hearer’s attention and is limited to the 1st and 2nd person pronouns. Bošković (2001: 60) observes that unlike argumental clitics (cf. 2b), ethical datives may appear above sentential adverbs.

⁷ In Old Polish *że* was attached to demonstratives in order to add emphasis. Some of these forms have been lexicalized in Modern Polish into *tenże* ‘this_{GEN}’, *tegoż* ‘this_{GEN}’, *temuż* ‘this_{DAT}’, and *tymże* ‘this_{INSTR}’. Moreover, *że* formed a complex conjunction together with the 3rd person copula *jest* and *li*: *je(st)+że+li*, which has been lexicalized as the complementizer *jeżeli* ‘if/whether’ (see Decaux 1955: 205-206).

- (18) Oni *su ti* pravilno odgovorili Mileni.
they be_{3PL} you_{CL.DAT} correctly answer_{PART.M.PL} Milena_{DAT}
‘They did the right thing in answering Milena.’/‘They gave
Milena a correct answer.’ (S-C, Bošković 2001: 60)

In Bulgarian and Macedonian, which have no second position pronominal or auxiliary clitics (they are verb-adjacent), *li* tends to occupy the second position.⁸ It normally follows the clause initial constituent,⁹ and can be freely separated from the pronominal and auxiliary clitics occurring lower in the sentence.

- (19) Včera *li* Penka *ja* *e* dala
yesterday Q Penka her_{ACC} be_{AUX.3SG} give_{PART.F.SG}
knigata na Petko?
book-the to Petko
‘Was it yesterday that Penka gave the book to Petko?’
(Bg, Tomić 1996: 833)

In addition, in Macedonian *li* exhibits distinct properties concerning the direction of its cliticization. The pronominal and auxiliary clitics procliticize on the verb, but *li* is an enclitic, and needs to be supported by some overt material in front of it, such as the main verb in (20b), which in turn is preceded by the auxiliary and pronominal clitics.

⁸ *Li* is also a second position clitic in Russian, as illustrated in (11).

⁹ This is a slight overgeneralization, because there might be more elements located in front of *li*. For instance, when *li* is preceded by a focused constituent, this constituent may in turn be preceded by a topic. Tomić (1996: 833) provides the example in (i), where the focused adverb *včera* preceding *li* is preceded by the topicalized subject *Penka*.

- (i) Penka včera *li* *ja* *e* dala
Penka yesterday Q her_{CL.ACC} be_{AUX.3SG} give_{PART.F.SG}
knigata na Petko?
book-the to Petko
‘Was it yesterday_{FOC} that Penka_{TOP} gave the book to Petko?’
(Bg, Tomić 1996: 833)

To explain the difference between generalized second position cliticization, which does not tolerate any violations, and operator second position cliticization, I suggest that the former is motivated by PF requirements, while the latter is a syntactic constraint that may be overridden if a relevant syntactic configuration is available in a language. Thus, I assume that operator clitics land in a functional head expressing Illocutionary Force, but this head may be dominated by Foci and Topics projecting above it.

- (20) a. **Li si mu gi dal parite?*
 Q be_{2SG} him_{DAT} them_{ACC} give_{PART.M.SG} money-the
- b. *Si mu gi dal li parite?*
 be_{2SG} him_{DAT} them_{ACC} give_{PART.M.SG} Q money-the
 ‘Did you give him the money?’ (Mc, Rudin et al. 1999: 544)

In Czech, which in contrast to Bulgarian and Macedonian has generalized second position clitics, *li* displays similar requirements concerning the direction of its cliticization. Toman (1996: 507) remarks that depending on a syntactic environment, pronominal clitics in Czech may either encliticize (cf. the first clitic *ji* in the infinitival clause in (21)) or procliticize (cf. the second clitic *ji* in the matrix clause in (21)). The symbol # indicates possible prosodic breaks. However, *li* in Czech may only encliticize, and in addition its host must be a verb (cf. 16 above).

- (21) Poslouchat (*#) *ji* (#) *by* *ji* (*#) *asi nudilo*
 listen_{INF} her_{ACC} would her_{ACC} probably bore
 ‘It would perhaps bore her (e.g. Ann) to listen to her (e.g. Mary).’
 (Cz, Toman 1996: 507)

4.4 Semantics of the host

Pronominal and auxiliary clitics in languages with generalized Wackernagel cliticization target the second position in all contexts without exception. In languages without generalized Wackernagel cliticization some clitics may occur in the second position depending on the semantics of the host. Examples (4) and (5) present this relation with respect to the complementizer and the conditional clitics in Old Church Slavonic. The same relation holds in Polish: the conditional auxiliary *by* is obligatorily attracted by the complementizers expressing condition and potentiality (cf. 22), optative mood (23), and subjunctive mood (cf. 24a).

- (22) a. *Gdy-by-m* *miał* *czas...*
 if+be_{COND}⁺AUX.ISG have_{PART.M.SG} time_{ACC}
 ‘If I had the time...’
 b. **Gdy miał-by-m czas...* (cf. Borsley & Rivero 1994: 418)
- (23) a. *Że-by-ś* *tylko tego nie robił!*
 that_{COND}⁺AUX.2SG only this NEG do_{PART.M.SG}
 ‘May you never do that!’
 b. **Że tylko tego nie robił-by-ś!* (cf. Bański 2000a 113)
- (24) a. *Powiedział, że-by-śmy* *to zrobili. (purpose clause)*
 say_{PART.M.SG} that_{COND}⁺AUX.IPL it do_{PART.M.PL}
 ‘He told/asked us to do it.’
 b. *Powiedział, że to zrobili-by-śmy* (indicative clause)
 say_{PART.M.SG} that it do_{PART.M.PL}⁺COND⁺AUX.IPL
 ‘He said we would do it.’ (Pl, Aguado & Dogil 1989: 105)

The examples in (24) illustrate a case in which the verb in the matrix clause does not require a complement in the subjunctive mood. The auxiliary need not be then adjoined to the complementizer and can be affixed on the *l*-participle. However, only the indicative meaning is then possible.

5 The mechanism of operator cliticization

I suggest that (24) demonstrates the mechanism of operator cliticization. It is used to formally mark that the sentence deviates from declarative (indicative) and to “clause type” it as focused (cf. the structures with the operator clitics *li* and *że*), conditional (cf. 22), optative (cf. 23), etc. This may happen through the merge of an operator clitic (as in the case of *li* and *że*), or through movement of a clitic (such as the conditional auxiliary). I will assume that the clitic is attracted by a Force-related feature located in a functional head in the left periphery of the clause (see e.g. Laka 1994, who postulates a Σ head that specifies Force). This head is possibly the highest one, as the auxiliary always ends up in the second position, adjacent to the complementizer.

This is a different operation than the generalized Wackernagel cliticization. It applies only to a selection of semantically related clitics. They target a designated syntactic position and show restrictions

concerning the categorial and syntactic status of their host. Space limitation prevents me from addressing the syntactic mechanism of generalized cliticization and relating it to operator cliticization in detail, so I will only point out some relevant problematic issues. One of the current analyses of generalized cliticization is the “scattered deletion approach” due to Franks (1998), adopted in a somewhat different version by Stjepanović (1999) and Bošković (2001). It presumes that clitics must raise as high as possible, targeting (on Franks’ version of the analysis) the top-most head position. If there is no overt material filling the Specifier of the highest head, the clitics may not be pronounced there, because they are not phonologically supported to their left. Therefore, the lower, second copy of the clitics is pronounced, while the highest one gets deleted through a PF filtering mechanism. This approach presupposes that all clitics move to the clause-initial position in syntax, but there are serious empirical problems with this idea (for a discussion of theoretical shortcomings of this proposal, see Bošković 2001: 62ff). Namely, there is little evidence for movement of pronominal elements or non-subject NPs to the clause-initial position, even if they are not clitics. If NP or pronominal objects do move to this position, they are interpreted as contrastively focused.

- (25) Mariju/ nju je Petar zagrlio
 Marija_{ACC}/ her_{ACC} be_{AUX.3SG} Petar hug_{PART.M.SG}
 ‘It was Marija/her that Petar hugged.’
 (S-C, Stjepanović 1999:73)

On the assumption that pronominal clitics move to the first position, but are pronounced in the second position due to a PF filter, they should still be interpreted at LF as occurring clause-initially. Given that objects in the first position are interpreted as contrastively focused, all pronominal clitics in Serbo-Croatian are in this scenario expected to have contrastive focus interpretation, contrary to fact.

An alternative is Progovac’s (2005) analysis, who proposes that clitics do not raise on their own, but that their movement is parasitic on the movement of the verb to the verb-second position. She assumes that the verb raises through the projections in which clitics are located, picks them up and drags to the ultimate landing position. The clitics are pronounced in the head of the chain, whereas the verb may be pronounced lower. A problem with this idea is that it assumes that the

clitics are suffixes; that is, they are adjoined to the silent copy of the verb. This implies that at a certain point in the derivation clitics in Serbo-Croatian are verb-adjacent, so they are categorially the same as Bulgarian/Macedonian verb-adjacent clitics, with the only difference pertaining to the fact that the verb can be pronounced lower. If this were so, some fundamental facts concerning the differences in the cliticization patterns between these language groups remain unexplained, such as the impossibility of clitic climbing out of embedded clauses in Bulgarian or the fact the Person Case Constraint holds in Bulgarian and Macedonian, but not in Serbo-Croatian (and other languages with generalized second position cliticization, such as Czech or Slovene). See Bošković (2001 ch. 4) and Migdalski (2006: 216ff) for relevant data and discussion.

The present paper does not provide an alternative account of generalized second position cliticization, but it has demonstrated that there is a subset of distinct cases of Wackernagel cliticization, which are proposed to be driven by the need to mark the Force of a clause. There is in fact ample crosslinguistic evidence for this type of operation, for instance some types of V2. The generalized V2 pattern found in most contemporary Germanic languages is an innovation. Eythórrsson (1995) and Fuss (2003) point out that the V2 order in Old Germanic was limited to Force-related contexts, which correspond to the “residual” V2 in Modern English (i.e. V-to-C movement in *wh*-questions, yes-no questions, and neg-preposing). It seems that second position cliticization in Slavic developed in the same way: in Old Church Slavonic it was restricted to clitics specifying Force, and at a later stage it was generalized to all clitics in some languages. This suggests that the operator cliticization described in this paper is related to the original Wackernagel X2 pattern in found in Early Indo-European languages.

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Evolving Syntax: Small Clauses, Subjacency, and Some Compounds*

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*"Nothing in biology makes sense
except in the light of evolution."
(Dobzhansky 1973)*

Many properties of present-day syntax *look* arbitrary and abstract, including some central postulates of syntactic theory, two of which I focus on in this paper: the small clause core of every clause/sentence (VP-internal subject hypothesis), and Islandhood/Subjacency. Some researchers have used such properties of syntax to claim that a gradualist approach to syntax is impossible – the principles of syntax are just too abstract for evolutionary forces to target them. As put in Lightfoot (1991), "Subjacency has many virtues, but ... it could not have increased the chances of having fruitful sex." My paper stands this argument on its head and proposes that decomposing syntax into intermediate evolutionary layers/steps not only makes syntax compatible with evolutionary forces, but it also renders it more tangible and less arbitrary. My argument proceeds on three fronts. First, I identify a set of marginal

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syntactic constructions available cross-linguistically, which I argue to be ‘living fossils’ from a proto-syntax stage in the evolution of human language (Section 1). Next, there is evidence in present-day syntax that these (proto-syntactic) constructs provide a foundation upon which complex syntactic structures are built, leading to quirks and complexities that best befit a scenario of evolutionary ‘tinkering’ (Section 2).¹ Finally, I seek corroborating evidence for this proposal in the studies of acquisition, aphasia, and language representation in the brain (Section 3).

This gradualist, step-by-step approach to the evolution of syntax is in the spirit of Pinker and Bloom (1990) and Jackendoff (1999, 2002), but my focus here is on the preponderance of well-defined and analyzed linguistic data. I assume with Jackendoff, as well as Bickerton (1990, 1998), that previous stages of evolution left traces/fossils in present-day languages, or continued to live in parallel with more complex constructions, as ‘living fossils.’²

1 ‘Living fossils’ from a proto-syntax stage

‘Living fossils’ of concern here can be characterized as constructions which exhibit rudimentary syntax/semantics, the kind which cannot be accounted for by the principles of modern morphosyntax, but which nonetheless shows continuity with it. In this section I discuss three such constructions: root small clauses, some of them formulaic (Section 1.1), V(erb) N(oun) ‘exocentric’ (non-headed) compounds (1.2), and paratactically combined small clauses, also typically formulaic (1.3).

1.1 *Various Types of Root Small Clauses (RootSCs)*

(1) illustrates English RootSCs and (2) equivalent Serbian RootSCs, which are typically formulaic and/or irrealis in nature:

¹ In the spirit of Darwin, and as elaborated in Jacob (1977), evolution is taken to be a ‘tinkerer,’ rather than an engineer. Unlike engineering, which designs from scratch, with foresight and plan, and with perfection, tinkering works by cobbling together out of bits and pieces that happen to be available, clumsily, with no long-term foresight.

² In biological literature, living fossils are defined as species that have changed little from their fossil ancestors in the distant past, such as lungfish (Ridley 1993).

- (1) Problem solved. Case closed. Mission accomplished. Family first! Everybody out! Me first! Him worry?!
- (2) Ja kriva?! Petar zaljubljen?! Niko nikud!
 I guilty Peter in-love Nobody nowhere
 ‘Me guilty?!’ ‘Peter in love?!’ ‘Nobody go anywhere!’
 Svi napolje!
 ‘Everybody out!’

Serbian has another type of RootSC, unaccusative RootSC (3), which surfaces in the unaccusative VS order, and which also features many formulaic specimens, especially in (3b):

- (3) a. Stigla pošta. / Pala vlada. / Došla zima. /
 arrived_{FSG} mail fallen_{FSG} government come_{FSG} winter
 Pao sneg. / Umro Petar.
 fallen_{MSG} snow died_{FSG} Peter
 ‘The mail has arrived./The government has fallen./The winter has arrived./It has snowed./ Peter has died.’
- b. Proš’o voz. Pala karta.
 gone train fallen card
 ‘The opportunity has passed.’ ‘Card laid, card played.’
 Pukla tikva.
 burst squash
 ‘The friendship/alliance ended.’

As argued in Progovac (2007), this VS word order can be explained only if the unaccusative hypothesis is coupled with the small-clause analysis. The awkwardness of the (otherwise natural) SV(O) order (4a) makes it clear that they are not just abbreviated/elliptical versions of some finite counterparts (4b) (for more details and some statistical data, see Progovac 2007):

- (4) a. ??Pošta stigla. ??Vlada pala. *Karta pala. *Tikva pukla.
 b. Pošta je stigla. Vlada je pala. Karta je pala. Tikva je pukla.

These half-clauses already mark the perfective aspect, and the expression of time/aspect in full counterparts must be redundant given that only past tense auxiliaries are compatible with these participles (for a derivation of

a full counterpart, see Section 2.1.). Agreement properties of full clauses exhibit redundancy and overlap even more obviously: the participle form agrees with the subject in number and gender, but not in person, while the auxiliary agrees with the subject in person and number, but not in gender. It is as though both layers of the clause have their own subject positions (Section 2.1), their own separate agreement properties, which partly overlap, and their own ways of encoding time/aspect, which again partly overlap. This suggests evolutionary tinkering, rather than optimal design (Progovac 2008).

All root small clauses share the following properties. First, they clearly involve a simple predication structure – a predicate (not necessarily verb) combines with its only argument, often theme.³ RootSCs also have a special semantics: they are often formulaic expressions, irrealis expressions, and/or expressions embedded in the here-and-now, conveying a sense of (immediate) urgency/relevance. This would follow if these RootSCs do not project Tense or TP, the conclusion for which there is clear structural evidence (Progovac 2006a, in press). In these clauses, there is no auxiliary in Serbian or English, no agreement in English and no person agreement in Serbian. In addition, the subject does not receive structural case, but rather appears in what looks like default case: accusative in English, and nominative in Serbian. Moreover, RootSCs cannot be manipulated by Move, including by wh-formation (5). This conclusion is further reinforced by the fact that Serbian unaccusative RootSCs surface with the underlying VS word order. Root small clauses in general are also not recursive: they cannot embed one within another (6) (Progovac, to appear).

(5) *Kada stigla pošta? *Ko umro? *When him retire? *Whom worry?
when arrived mail who died

(6) a. *Mislim (da) pala vlada.
think._{1SG} (that) fallen government
b. *Him believe case closed. *Him worry me first?!

³ My discussion in this paper is restricted to intransitive clauses. Transitivity, which necessarily involves an additional, vP layer, may have been a later evolutionary innovation.

It is possible that RootSCs are assembled by an ancient adjunction-like operation, which does not build hierarchical structure, and which can be characterized as ‘Proto-Merge.’ In other words, protosyntactic clauses can be characterized as exocentric (non-hierarchical) constructions which consist of a predicate and an argument, lacking grammatical categories such as tense or structural case, and lacking Move. Clearly, such constructions show continuity with more complex clauses, which also involve predication, and which, as will be argued in Section 3.1, are actually built upon protosyntactic clauses.

The following sub-section considers exocentric compounds, whose very name invokes a non-headed/non-hierarchical strategy, and which, also, must have been put together by a predecessor of Merge.

1.2 Exocentric V(erb) N(oun) compounds

Exocentric Verb-Noun compounds are attested crosslinguistically, even in non-IE languages. Some English examples are given in (7), and some Serbian in (8):

- (7) scare-crow, kill-joy, pick-pocket, cut-purse, spoil-sport, turn-coat, hunch-back, dare-devil, wag-tail, tattle-tale, saw-bones, cut-throat, Shake-speare, Love-lady, Burn-house, Drink-water, Bere-water, Love-joy, Drynk-pany (miser), Pinch-penny (miser)
- (8) ispi-čutura (drunkard), guli-koža (who rips you off), cepi-dlaka (who splits hairs), vuci-batina (good-for-nothing), muti-voda (who muddies waters, trouble-maker), jebi-vetar (fuck-wind, charlatan), probi-svet (break-world, wanderer), seci-kesa (cut-purse), vrti-guz (spin-butt, fidget); vrti-rep (spin-tail, fidget), pali-kuća (who burns houses), Popi-voda (drink-water), Kolji-vratić (cut-throat), Gazi-voda (tread-water)

Like RootSCs discussed in the previous section, VN compounds can also be seen as protosyntactic small clauses, involving predication, but lacking tense, case, or Move. It is important to note that VN compounds are not all analyzable as Verb + Object/Complement structures, as is typically assumed. Serbian (9) (a) could still fall within this description, given that they are unaccusative, but (b) are unergative. English (10) also features a mix of both types.

- (9) a) *duri-baba* ‘sulk-old.woman=who sulks like an old woman’(cf. *worry-wart*)
smrdi-buba ‘stink-bug=a species of bug that stinks; a person who stinks’
Tresi-baba ‘shake-old.woman= a mountain name’ (cf. *rattle-snake; Shake-speare*)
visi-baba ‘hang-old.woman=flower: snowdrop’
- b) *plači-drug* ‘cry-friend, who commiserates with you’
plači-baba ‘cry-old.woman=crybaby’
kaži-prst ‘show/say-finger=index finger’
#striži-buba ‘grate-bug=an insect which pecks trees’
tuži-baba ‘complain-old.woman=who complains like a woman’
trči-laža ‘run-lie=one who spreads lies’
- (10) rattle-snake, catch-word, cry-baby, stink-bug, tumble-weed, worry-wart, copy-cat, skin-flint, blabber-mouth

My argument is that these compounds in fact involve a very basic type of verbal predication, call it proto-predication, characterized by unspecified, vague theta-role assignment, which is possibly correlated with the lack of headedness.⁴ When the noun can (pragmatically) play the role of a subject, the compound is perceived as headed (*kaži-prst*, *stink-bug*, *cry-baby*), but when it is necessarily an internal argument, it is perceived as exocentric (*pick-pocket*, *kill-joy*). The most successful/expressive ones in fact can be doubly-interpreted: *jebi-vetar*, in addition to evoking a metaphor of somebody copulating with the wind, is also just wind, a transient and useless occurrence (charlatan); *dare-devil* is one who dares

⁴ A reviewer points out that even some endocentric compounds, such as N-N compounds, can have vague theta role assignment, e.g. *student films* (films by students) vs. *film festival* (festival showing films). Compounds in general are of interest from an evolutionary point of view in this respect, but what sets VN compounds apart is that they clearly involve a verb, and other types of verbal compounds do not show this kind of ambivalence (cf. e.g. *truck-driver*); see also further discussion in the text.

the devil, and at the same time a devil himself; *pali-drvce* (ignite-stick, matches): is *drvce* here what gets ignited, or what ignites, or both?⁵

In this respect, the grammar of VN compounds resembles that of some ergative intransitive verbs in e.g. Tongan, a Polynesian language (Tchekhoff 1979, 409):

- (11) 'oku kai 'ae iká.
 pres. eat the fish
 'The fish eats. / The fish is eaten.'

Only once a specifically marked agent is introduced (e.g. 'the man') is the thematic role of 'the fish' necessarily specified as theme/patient. The addition of an agent marker (e.g. *-er*) in compounds has a comparable effect on the thematic role of the noun (consider the completely different semantics of e.g. *snake-rattler*; ??*baby-cryer*).

Thus, proto-predication operative in VN compounds can be characterized as the assignment of a thematic role to the argument, but not a specific thematic role. Clearly, proto-predication shows continuity with predication in modern clauses, which also assigns a theta role, but with more precision. The assignment of thematic roles even with present-

⁵ VN compounds in Serbian also show ambivalence in morphological headedness. In a sense, the noun acts as a morphological head for the whole compound, but in another sense, it does not. For example, if the noun is F (e.g. *laža* (lie), *čutura* (flask)), the whole compound declines as simple F nouns would, by taking the characteristic ending *-u* in the accusative (*lažu*, *čuturu*). On the other hand, the choice of the demonstrative is influenced, but not determined, by the F form of the noun: if the noun is F, the demonstrative for the whole compound can be either F or M:

<u>Nominative</u>		<u>Accusative</u>	
<i>ta.F. /taj.M.</i> (this)	<i>trči-laža.F</i>	<i>tu.F /tog.M</i>	<i>trči-laž-u.F</i>
<i>ta/taj</i>	<i>ispi-čutura.F</i>	<i>tog/tu</i>	<i>ispi-čatur-u.F</i>
<i>taj</i>	<i>jebi-vetar.M</i>	<i>tog</i>	<i>jebi-vetr-a.M</i> .Animate
<i>taj</i>	<i>vadi-čep.M</i>	<i>taj</i>	<i>vadi-čep.M</i> .Inanimate
<i>to.N</i>	<i>pali-drvce.N</i>	<i>to.N</i>	<i>pali-drvce.N</i>

A reviewer points out that there are other phenomena in Slavic that show morphological mismatches, such as *taj novi sudija* (that-M new-M judge-F). However, the mismatches in VN compounds cannot be reduced to semantic matters. A compound like *ispi-čutura* can be used with a F demonstrative or adjective, even when referring to a male (i), and this is not possible with nouns like *sudija* (ii).

- (i) Ta (grozna) ispičutura/vucibatina! Taj grozni ispičutura/vucibatina!
 (ii) *Ta grozna sudija! Taj grozni sudija!

day predication is far from precise, and depends on the presence of other arguments in the clause. The process is clearly on a continuum, and its understanding may profit from an evolutionary exploration.

In addition to the proto-predication features illustrated above, VN compounds show additional properties which cannot be captured by the principles of modern morpho-syntax (Progovac 2006b; in submission). First, as their very name suggests, they are non-headed, non-hierarchical creations, which again seem to be put together by an adjunction-like operation, which can be considered as Proto-Merge, that is, as Merge which does not build hierarchical structure (see previous section). Second, and rather surprisingly, the verb in these compounds in Serbian is clearly in the imperative form (many imperative proposals exist also for older exocentric compounds in Romance and Germanic languages; see Progovac 2006b, in submission). Arguably, the imperative form is the least marked verbal form, which precedes other forms in evolution (and perhaps acquisition). Also, as is the case with RootSCs (see previous section), exocentric compounds show no Move or recursion, in contrast to e.g. *-er* compounds in English (*dish-washer user*).

Last but not least, exocentric VN compounds have a special semantics as well: they are striking/expressive metaphors which use simple/basic vocabulary (including body parts and functions) to express abstract human traits, in a playful and humorous manner. VN compounds have been reported for various languages, including English and Romance, to have involved “unquotable coarseness,” partly explaining why thousands of them have been lost, failing to make their way into dictionaries or grammar books (see Section 3.2 for the significance of coarse examples). In addition, their primary function is referential, that of naming, the function proposed to have preceded the propositional stage in the evolution of language (e.g. Rolfe 1996).

In sum, there are several reasons why root small clauses and VN compounds should be considered as living fossils of a previous stage in language evolution. First, they show syntax/semantics which is left unexplained by the principles that account for modern syntax/semantics: (i) underspecified theta role assignment of ‘proto-predication’; (ii) Merge which does not render hierarchical structure or recursion (Proto-Merge); (iii) lack of Move; (iv) unusual semantics. At the same time, they also show continuity with modern-day constructions, and could have, thus, constituted a stepping-stone into modern syntax. For example, proto-

predication still has elements of predication (the assignment of a theta role), and Proto-Merge still has elements of Merge. Finally, there is evidence that these fossils are being built into the very foundation of the modern clause, providing possibly the strongest evidence for continuity (Section 2).

The following sub-section looks at another possible fossil, loose (exocentric) combinations of two small clauses.

1.3 Loose/paratactic combinations of small clauses

Just as small clauses and exocentric compounds can be analyzed as simplest syntactic combinations of an argument and a predicate, structures in (12-13) can be seen as simplest possible combinations of clauses, involving a paratactic/exocentric/non-hierarchical type of attachment, resembling adjunction (for the proposal that adjunction in modern languages is an evolutionary fossil, see Jackendoff 1999, 2002). These constructions, again, do not permit recursion or Move (14-15):

- (12) Serbian:
 Na psu rana, na psu i zarasla. Preko preče, naokolo bliže.
 On dog wound, on dog healed. Across shorter, around closer.
 Magarac u Carigrad, magarac iz Carigrada.
 Donkey into Istanbul, donkey out of Istanbul.
- (13) Nothing ventured, nothing gained. Easy come, easy go. Monkey see, monkey do. Card laid, card played.
- (14) ???Nothing ventured, nothing gained, nothing lost.
- (15) a. *Gde/kako preče, naokolo bliže?
 Where/how shorter, around closer?
 b. *What ventured, nothing gained?

Notice that all the fossils discussed thus far, RootSCs, VN compounds, and paratactically combined small clauses, lack the ability to be manipulated by Move (or recursion). If these are indeed fossils of a proto-syntax stage, then one can begin to see Subjacency effects in a completely different light, “in the light of evolution” (Section 2.2).

2 The fossils 'live'/continue in present-day structures

2.1 Small clauses 'live' inside all clauses/sentences

Small clause fossils are built into the very foundation of a complex clause, providing possibly the strongest argument for continuity, and for the gradualist, step-by-step approach to the evolution of syntax. One reasonably uncontroversial finding of theoretical syntax is that a typical sentence/clause unfolds from an underlying small clause (16-17), and transforms into a (finite) clause/sentence only upon subsequent Merge of Tense (and possibly other functional projections), and subsequent Move of the subject to the specifier of TP (e.g. Stowell 1981, Kitagawa 1986, Koopman and Sportiche 1991, Chomsky 1995 and subsequent Minimalist work). Thus a sentence has at least two layers of structure, two subject positions, and occasionally even two subjects (18-19).

- (16) a. Small clause: [_{SC} pala [_{NP} vlada]] → b. [_{TP} je [_{VP} pala [_{NP} vlada]]]
→ c. [_{TP} vlada [_{T'} je [_{VP} pala t]]]
- (17) a. Small Clause: [_{SC/AP} Sheila sad] → b. [_{TP} is [_{AP} Sheila [_{A'} sad]]] →
c. [_{TP} Sheila [_{T'} is [_{AP} t [_{A'} sad]]]]
- (18) [_{TP} The jurors will [_{VP} all rise]]. (Cf. Small Clause: *All rise!*)
- (19) [_{TP} There were [_{SC} three linguists in the room]].

In this scenario, TP/sentence would not have arisen from scratch, designed in an optimal way (e.g. Chomsky 2005), but rather it would have been superimposed upon (tinkered from) what was already there: the small clause layer. Evolution is said not to throw away/discard a good thing, but rather to build upon it. It is as if the building of the sentence today retraces evolutionary steps (Progovac 2008, in press; to appear). Thus the 'imperfections' of the syntactic system, including Move and multiple subject positions, redundancy in agreement and tense/aspect expression (Section 1.1), as well as rather messy theta-role assignment mechanisms, can all be seen as a consequence of evolutionary tinkering.

In brain stratification accounts (e.g. Vygotsky's and Piaget's work, as well as in the triune brain proposals) the common theme is the

inclusion of attainments of earlier stages in the *structures* of later stages. According to Vygotsky (1979/1960, 155-156) “instinct is not destroyed, but ‘copied’ in conditioned reflexes as a function of the ancient brain, which is now to be found in the new one.” As put in Bickerton (1998, 353) “the creation of a new neural pathway in no way entails the extinction of the previous one.”⁶ In addition to shedding new light on the small clause beginnings of the sentence, this reasoning also opens up a novel way of looking at Subjacency.

2.2 Subjacency in the light of evolution

If indeed the data introduced in Section 1 are illustrative of a proto-syntactic stage, then this stage did not have Move, and neither did it have (recursive) subordination.

However, the persistent view of Subjacency (Minimalism and its predecessors) considers the availability of Move(ment) to be the default option, while Subjacency (restrictions on Move) is treated as a marked option, in need of explanation (Ross 1967, Huang 1982, Chomsky 1986, to appear, Stepanov 2007).⁷ This view feeds the influential language evolution hypothesis, according to which Merge (which subsumes Move) was the only evolutionary breakthrough for syntax: once it emerged, it was able to apply freely and recursively (Hauser, Chomsky and Fitch 2002, Chomsky 2005). In an attempt to reconcile this view with the gradualist approach, Newmeyer (1991) proposes that a grammar with Subjacency was specifically targeted by natural/sexual selection. Lightfoot (1991) counters that “Subjacency has many virtues, but ... it

⁶ Newly emerged patterns become dominant and ‘rework’ older patterns into conformity with them (e.g. Rolfe 1996; Vygotsky 1979). Layering and recency dominance are also observed in the superimposition of timed speech (segments) over ancient prosody. Intonation and prosody, which are modulated analogically, rather than discretely, must have been available before syntax; e.g. they have significant analogs in other species (Deacon 1997; Piattelli-Palmarini and Uriagereka 2004). As put in Deacon (1997, 251), it is as though we haven’t so much shifted control from visceral to voluntary means but superimposed intentional cortical motor behaviors over autonomous subcortical vocal behaviors.

⁷ Technically speaking, in Minimalism, Move needs to be motivated by e.g. a need to check strong features, so, in this sense, it is not completely free. However, once such (strong) features are present in the derivation, the assumption is that Move is able to apply, unless blocked by some syntactic principle. Subjacency effects are thus unexpected and marked, in need of explanation.

could not have increased the chances of having fruitful sex.” Berwick (1998, 338-339) concludes that “there is no possibility of an ‘intermediate’ *syntax* between a non-combinatorial one and full natural language—one either has Merge in all its generative glory, or one has no combinatorial syntax at all ...” (see also Bickerton 1990, 1998).

But there is an alternative possibility, consistent with the data and analysis introduced in the previous sections, that No Move is the default, and performing Move a special/marked option (also mentioned in Cinque 1978, Postal 1997, Boeckx and Grohmann 2007, Progovac, to appear). But why would No Move be the default? My proposal is that proto-syntax, the syntax which was based on small clauses, did not have Move. Move is an innovation which was made possible (or perhaps necessary) only upon the introduction of layered/hierarchical clausal structure and specific functional projections. In fact, the constructions that prohibit Move in modern languages are much more numerous and diverse than those that allow it:

Some (clausal) islands:

- (20) Adjuncts: *Who did Peter resign [after Mary met ~~who~~?]
- (21) Conjunctions: *Who did he hurt ~~who~~ and Mary knows it?
- (22) Subjects: *Where is [that she retired from ~~where~~] fortunate?
- (23) Relative clauses (Complex NP) *Where will the linguist [who just retired from ~~where~~] give a talk?
- (24) Nominal clausal complements (Complex NP) *Where is the suggestion [that she should retire from ~~where~~] crazy?
- (25) Wh-clauses: *Where did she wonder [why she retired from ~~where?~~]

Basically, extraction is possible only out of (a subset of) complements, e.g. verbal (non-wh) complements (26). In other words, environments that allow Move constitute a natural class, but the environments that disallow Move do not constitute a natural class.

- (26) Where does Mary say [that Peter believes [that she will retire from **where**]]?

In addition to the cases typically considered under Subjacency, there are additional contexts in which Move is prohibited:

- (27) Across sentential boundaries: *Who did Mary see the movie. It featured **who**?
- (28) From paratactically (loosely) attached (small) clauses: *What nothing ventured, **what** gained?
- (29) From adjunct small clauses: *Where can her having retired from **where**, we finally relax?
(can be subsumed under Adjunct Islandhood)
- (30) From Root Small Clauses: *Where her retire from **where**?
*Who(m) retire from MIT?!

Since the constructions that prohibit Move have no syntactic property in common, they are usually characterized negatively, as e.g. not being L-marked, or not being a complement of a lexical item (Chomsky 1986).⁸ Even though this has been one of the central topics of syntactic theory since Ross (1967) and Huang (1982), to date, there has been no good analysis of Subjacency (Belletti and Rizzi 2000, Szabolcsi and den Dikken 2003, Boeckx and Grohmann 2007).

My claim is that between the two polar opposites of being completely separate utterances/sentences vs. being syntactically fully integrated (e.g. subordination), there is an intermediate possibility, to be

⁸ Most accounts stipulate which syntactic nodes (S, NP, CP, DP etc.), and/or which combination of nodes, and/or nodes in which syntactic positions, constitute barriers/bounding nodes/phases for Move. Moreover, some of these obstacles are considered weak and some strong (see also Stepanov 2007). Belletti and Rizzi (2000) report an interview with Chomsky, in which he says that “there is no really principled account of many island conditions.” Boeckx and Grohmann (2007) argue that the most recent phase-based approaches fare no better (e.g. Chomsky 2001, to appear): “they are only a recycling/reincarnation of the previous ideas and stipulations, such as bounding nodes and barriers, with no overall improvement.”

loosely attached (adjoined/semi-integrated) into sentential fabric, and this is the case with e.g. clausal adjuncts and conjuncts (see also concatenation of small clauses in Section 1.3). Clausal conjuncts and adjuncts have been repeatedly noted not to be fully integrated into syntactic fabric. First, they are often parsed as separate intonation-phrases (Nespor and Vogel 1986, Selkirk 1978, Stowell 1981, Zec and Inkelas 1990), which is consistent with them sitting in semi-integrated, ‘noncanonical,’ syntactic positions, as put in An (2007). Next, adjuncts have been analyzed as “merging in a different plane” (Chomsky 2001), and conjuncts as sitting on parallel planes (Goodall 1987).

But why should a grammar have this range of constructions? According to e.g. Traugott and Heine (1991) and Deutscher (2000), grammaticalization of subordination (33) proceeds through these three stages, including parataxis (adjunction) (31) and coordination (32). In other words, it proceeds from least syntactically integrated to most integrated:

- (31) He is a linguist—(as) you know. (Parataxis)
 (32) He is a linguist, and you know it. (Coordination)
 (33) You know that he is a linguist. (Subordination)

If comparable stages characterized language evolution, with adjunction and coordination constituting intermediate steps between separate utterances (no syntactic integration, no Move) and subordination (full(er) integration, free(er) Move), then such evolutionary tinkering left us with multiple possibilities which partly overlap in function (31-33). Overlap and (partial) specialization are properties of evolutionary tinkering, rather than of optimal design.⁹

Importantly, in addition to allowing Move, subordination also provides a recursive mechanism for embedding multiple viewpoints one within another, unavailable with either coordination or adjunction, privileging (36) over (34-35):

⁹As put in Carroll (2005, 170-171), “multifunctionality and redundancy create the opportunity for the evolution of specialization through the division of labor...”

- (34) [As you know,] [as Mary knows,] he is a linguist.
- (35) He is a linguist, [and you know it,] [and Mary knows it].
- (36) You know [that Mary knows [that he is a linguist]].

If subordination (as well as Move) is an innovation resulting from evolutionary tinkering, then (recursive) subordination would have significantly increased the expressive power of language, in a concrete and tangible manner, and thus, unlike Subjacency, constitutes a plausible target for natural/sexual selection.¹⁰ In this evolutionary perspective, rather than a system designed from scratch in an optimal way, syntax is seen as a patchwork of structures incorporating various stages of its evolution, giving an impression, or an illusion, of Subjacency.

3 Some corroborating evidence

3.1 Acquisition and Agrammatism

Language acquisition arguably likewise proceeds from a root small clause (or root infinitive) stage to a TP stage (among others, Radford 1990, Lebeaux 1988, Platzak 1990; but see Guasti 2002 for opposing views). According to Studdert-Kennedy (1991) and Rolfe (1996), present-day views of ontogeny/phylogeny warrant the use of ontogeny, development in children, to corroborate hypotheses about phylogeny, development in species (see also Ridley 1993). The emergence of Tense/TP in phylogeny, just as it does in ontogeny, would have created an opportunity for specialization and division of labor between small clauses and e.g. finite clauses, leading to many complexities of syntax. As for VN compounds, Clark, Hecht and Mulford (1986), among others, report that children, at an early stage, consistently produce compounds such as 'grate-cheese' instead of 'cheese-grater,' 'rip-paper' instead of 'paper-ripper'. Moreover, imperative in general is among the first productive verbal forms used by young children (e.g. Bar-Shalom and Snyder 1999).

¹⁰ In response to a reviewer's question regarding why complex syntax evolved, which is taken up in more detail in Section 4.2, I point out that this particular innovation in syntax, subordination, would have provided a communicative advantage.

According to Kolk (2006, and references there), preventive adaptation in agrammatic patients leads to a bias to select simple types of constructions, often subsentential (including small clauses), with control speakers producing about 10% nonfinite clauses and aphasics a much larger percentage, 60% in Kolk and colleagues' studies. A PET study by e.g. Indefrey et al. (2001) shows that nonfinite clauses require less grammatical work (see Kolk 2006 for many references and details).

3.2 Representation in the brain

The data introduced in Section 2, arguably the 'living fossils' of syntax, are often formulaic/stereotypical expressions (e.g. *Case closed. Me first! Pala vlada. Pala karta. Nothing ventured, nothing gained. Preko preče, naokolo bliže.*), and some are vulgar/obscene, as is the case with many VN compounds (*jebi-vetar*, see also below).

Obscene words in general, including "visceral" ones (related to body parts and functions), which are frequently found in vulgar VN compounds, are processed by the more ancient structures of the brain. This is also the case with formulaic speech, found in various root small clauses. According to Code (2005: 317), swearwords, as well as some other stereotypical/ formulaic uses of language, might represent fossilized clues to the evolutionary origins of human communication, given that their processing involves the right hemisphere, basal ganglia, thalamus and limbic structures.¹¹ It has also been reported by many that the use of cursing and dirty words is more common in males than in females (e.g. Jay 1980), and this is true even in language disorders (Code 2005). Strong emotions expressed in animals are those of lust and hostility, and they may have been the first verbal expressions uttered by humans (Code 2005: 322).

It is conceivable that a strategy akin to VN compounding was used in ancient times predominantly by males for display/ritual insult purposes (Progovac and Locke, 2008).¹² It is true, as pointed out by a reviewer,

¹¹ Tourette's Syndrome, a disorder caused by basal ganglia-limbic connection dysfunction, is characterized by involuntary production of obscene speech. Likewise, a stroke to the right basal ganglia can lead to the loss of overlearned/formulaic speech, including swearwords, prayers, and counting.

¹² Throughout recorded history, sexually mature males have issued humorous insults in public and ritual insulting continues even today in a wide range of cultures around the world (see Locke and Bogin, 2006, and many references there).

that obscenities can be expressed even by well-behaved, headed syntactic structures. However, what is intriguing about VN compounds is that they *specialize* for derogatory reference, and I do not know of any other well-defined morpho-syntactic structure that does so. As discussed in Progovac and Locke, the ability to create successful derogatory compounds on the spot could have indeed had an effect on reproduction. It would have enhanced relative status first by derogating rivals and placing prospective rivals on notice; and second by demonstrating verbal skills and quick wittedness.¹³ When it comes to some Serbian VN compounds, preserved in names, it is notable that the vast majority (of obscene ones) target males, e.g. *Poj-kurić* ‘sing-dick’ (womanizer). Even those that seem to describe females are typically used in reference to males, for a doubly insulting effect (Mihajlović, 1992): *Laj-kučka* ‘bark-bitch’ (loud and obnoxious person); *Lezi-baba* ‘lie-old-woman’ (loose woman or man); *plači-pička* ‘cry-cunt’ (vulgar version of *cry-baby*). Not only do these compounds suggest an ancient syntactic strategy, but they also provide potential evidence of sexual selection, selecting for (proto-) syntax.

This discussion barely begins to address a reviewer’s question: why did syntax evolve? First of all, if syntax evolved through common evolutionary forces, through local tinkering, rather than global optimal design (see Footnote 1), then this question can be rephrased as follows. Once a certain trait (in this case syntactic) became available by some evolutionary chance (e.g. mutation, drift, or perhaps cultural innovation), what was so beneficial about this trait that those who had it left more offspring than those who did not have it? Clearly, at this point, nobody has an answer to the great general question of why syntax evolved, but

¹³ Tiny selective advantages are sufficient for evolutionary change: a variant that produces on average 1 per cent more offspring than its alternative allele would increase in frequency from 0.1 per cent to 99.9 per cent of the population in just over 4,000 generations (Pinker and Bloom 1990 and references there). This would still leave plenty of time for language to have evolved: 3.5-5 million years, if early Australopithecines were the first talkers, or, as an absolute minimum, several hundred thousand years in the unlikely event that early *Homo sapiens* was the first. (Fixations of different genes can go in parallel.) Pinker and Bloom (1990) assume the Baldwin Effect for language, the process whereby environmentally-induced responses set up selection pressures for such responses to become innate, triggering conventional Darwinian evolution (see also Deacon 1997).

that does not mean that syntax did not evolve gradually through selection, and that does not mean that one should not investigate smaller, less ambitious questions. As put in Jacob (1977, 1162), “while asking general questions [in science] led to limited answers, asking limited questions turned out to provide more and more general answers.” Understanding how and why syntax evolved has to be a result of an investigation, rather than a prerequisite for it.

What I offer here is a hypothesis for why the ability to create derogatory VN compounds would have been beneficial to our ancestors.¹⁴ It may well be, as suggested by the other reviewer, that such basic combinations also enhanced communication and cooperation. I focus on the sexual selection argument because it is there that these particular data point. This is not to say that other forces were not relevant, or even of primary significance, for the development of syntax in general—this is only to say that given the available VN compound data, we can see some evidence for sexual selection.

The possibility that sexual selection played a role in evolving *some* aspects of syntax is also consistent with the findings reported in e.g. Ullman (2008), and references there, that there is a gender difference when it comes to relying on declarative vs. procedural memory in language processing.¹⁵ Even though the two memories interact and can compensate to some extent for each other’s weaknesses, declarative memory is primarily used for the lexicon and irregular morphology, while procedural memory specializes for syntax and regular morphology. Ullman (2008) reports that males do not use declarative memory to store

¹⁴ In Section 2.2., I mentioned another hypothesis regarding why subordination, as well as Move, might have been beneficial—they provided a means for true recursion, that is, for embedding one viewpoint within another.

¹⁵ Sexual selection sometimes results in marked sexual dimorphism, i.e. marked gender differences, as is the case with the peacock’s tail. A reviewer wonders why women developed syntax at all under the sexual selection scenario. Again, sexual selection may have been only a part of the story, only one aspect of it. Using word combinations (proto-syntax) for communication purposes other than ritual insult would have clearly been beneficial to both men and women. Moreover, as mentioned in e.g. Miller (2000, 89), there is a high genetic correlation between the sexes in humans (Darwin’s 1874, 608 “principle of equal transmission),” which prevents marked dimorphism. Due to this, there is, e.g., a very high genetic correlation between male and female height in humans: female height increases 98% as fast as male height.

regulars, but rather rely solely on the procedural memory, while females use declarative memory to store even regulars. Future research on VN compounds may provide new insight into this matter, given that these compounds straddle the boundary between lexicon and syntax: as names, VN compounds may be stored in the lexicon, but, as analytic morpho-syntactic creations, they might also be processed by procedural memory.

4 Concluding remarks

My claim is that exploring syntax from a gradualist (step-by-step) evolutionary perspective is not only possible, but it also renders syntax more tangible, and can shed light on its very nature. Some of the universal principles and constraints may in fact be a by-product of evolutionary tinkering. There is some corroborating evidence for the proposal from language acquisition, agrammatism, and language representation in the brain. But the strongest arguments for the gradualist evolution of syntax may come from syntax itself. One such argument is the persistence, in all languages, of ‘syntactic fossils,’ constructions which cannot be accounted for by the principles governing modern syntax, but which nonetheless show continuity with modern syntax, and which could have served as a stepping-stone into modern syntax. Another argument is the evidence of evolutionary tinkering in the very structure of modern syntactic constructions, where these simple (fossil) structures serve as a foundation for building more complex structures.

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Hamblin Pronouns in Modal Existential Wh-Constructions*

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Modal Existential Wh-Constructions (MECs) are cross-linguistically characterized by three obligatory syntactico-semantic properties: the presence of a fronted wh-word, existential quantification over the variable that it expresses, and a modal force of the verb to which the wh-word relates as an argument or adjunct. In addition, the MEC is obligatorily selected by a verb, usually ‘be’ or ‘have’ (BE/HAVE for short), which is believed to be the source of the existential quantification. The modality is typically expressed by infinitival or subjunctive mood on the main verb. MECs occur in all Slavic and Romance languages, as well as Hungarian, Greek, and some Semitic languages (Modern Hebrew). Below, I give an example from Czech.

- (1) Mám / Je si s kým promluvit.
have / is REFL with who talk
‘There is someone (for me) to talk with.’

In this paper, I argue against earlier proposals that MECs are operator-variable structures, resembling free relatives or embedded questions (Izvorski 1998, Caponigro 2003, and Grosu 2004). I offer an alternative view according to which the wh-words in MECs (MEC wh-words for short) denote “Hamblin pronouns,” i.e., sets of individuals (Kratzer and Shimoyama 2002). The movement that they undergo is

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characterized in discourse terms, namely as “escaping narrow focus.” I follow Yanovich (2005) in assuming that Hamblin pronouns need to be licensed by *c*-commanding operators of a certain kind. The proposed analysis readily explains the non-specificity of MECs (obligatory narrow scope w.r.t. negation, quantifiers, but also the MEC-internal modality), which so far has only had the status of an observation.

The paper is organized as follows. Section 1 presents arguments against the operator-variable analysis of MECs and shows that MEC wh-words behave like non-operator indefinites (‘something’, ‘anything’). Section 2 analyzes MEC wh-words as Hamblin pronouns and BE/HAVE as a deontic modal with existential force. Section 3 concludes the paper.

1 The non-operator nature of wh in MEC

The present proposal is based on the assumption that MEC wh-words are indefinites rather than operators. This is in contradiction with standard beliefs. Izvorski (1998) proposes that MECs are reducible to embedded questions. In Caponigro (2003), MECs are free relatives that lack a maximality/iota operator (D-head). For Grosu (2004) MECs are specialized CPs, headed by an existential generalized quantifier. In all these proposals, the MEC wh-word is a (syntactic) operator, undergoing movement to SpecCP. Let us call these accounts “CP-based.” In this section, I present evidence that MECs are not full CPs and that MEC wh-words are not operators, at least in Slavic.

1.1 Slavic MEC are not CPs

In Šimík (2008a), I argue that the Czech infinitival MEC is not a CP. Instead, it is a vP and the “matrix” predicate BE/HAVE is generated in its functional layer (TP) and is therefore closer to a modal/auxiliary than a wh-clause-selecting verb. See the following schema:

(2) [CP ... [TP BE/HAVE [MEC wh_i [vP ... { V t_i } ...]]]

Arguments for this position include the transparency of MECs for A'- and clitic-extraction, the impossibility of selecting an MEC by a CP-correlative pronoun, and the availability of nominative Case-assignment and agreement relations between the “matrix” HAVE and the “embedded” wh-word. Here, I cannot repeat these arguments for reasons

of space and will limit myself to providing some additional evidence.

Consider the following transparency contrast between embedded questions (EQs) and MECs. EQs are islands for extraction of non-specific (non-referential) material. MECs are different in this respect, which is illustrated in (3), an example involving VP-extraction. The verb *nemám* ‘I don’t know’ introduces an MEC and the predicate *nevím* ‘I don’t know’ introduces an EQ.

- (3) [Jít do kina]_i bohužel nemám / *nevím s kým _{t_i}.
 go to cinema unfortunately not.have / not.know with who
 ‘As for going to the cinema, there’s nobody for me to go with.’

Similar evidence against a CP analysis of MECs can be obtained from other Slavic languages. Like Czech, Serbo-Croatian allows for clitic climbing out of MECs but not out of EQs (Senka Stanivukovićová, p.c.).

- (4) Nemam / *Neznam *to*_i [_{MEC} komu dati _{t_i}]
 not.have / not.know it who give
 ‘There’s noone for me to give it to / I don’t know to whom I should give it.’

This is relevant because clitic-climbing across a CP boundary is generally prohibited (see e.g. Dotlačil 2007 and the literature cited there).

As discussed in Rappaport (1986), Russian MECs allow to express a “matrix”-scope negation in the form of an affix on the wh-word, as illustrated in (5a). Moreover, (5b) shows that the two morphemes form a syntactic constituent as they can appear together in a displaced position – e.g. to the left of a “matrix” sentential adverb *navernoe* ‘perhaps’ (Zhenya Markovskaya, p.c.).

- (5) a. Mne nekomu ego otdat’
 me_{DAT} neg.who him give
 ‘There’s noone for me to give it to.’
 b. Nekomu navernoe Saše ego otdat’
 neg.who perhaps Saša_{DAT} him give
 ‘Perhaps, Saša has noone to give it to.’
 *‘Saša has noone to whom she can perhaps give it.’

Kondrashova (2008) identifies the negative morpheme on the wh-word as a negated existential quantifier, i.e., the negated “matrix” BE. Obviously, the *neg-wh*-constituency is difficult to derive in a CP-based account.¹

1.2 *Wh* in MEC do not undergo operator movement

Once we recognize that MECs are not CPs, we face the question of what kind of movement the MEC wh-word undergoes. One possibility, explored in Šimík (2008a), is that it undergoes (relative) operator movement to the left periphery of vP. MECs would thus be “vP-level free relatives.” An advantage of this approach is that it does not force us to make any specific assumptions about the nature of MEC wh-words: they retain their characteristic operator-status. However, the approach also makes some false predictions. First, if MEC wh-words are operators, nothing prevents them from undergoing successive cyclic movement, comparable to the situation in infinitival relatives in English, as in (6) (Bhatt 1999:12). The Czech example in (7) shows that this is not correct.

(6) Here’s a book [*Op* to tell your parents [*t* that you’re reading *t*]]

(7)* Nemám [*co* říct tvým rodičům [*t* že jsem četl *t*]]
 not.have what tell your parents that AUX_{1SG} read
 ‘There’s nothing to tell your parents that you’re reading.’

The following examples from Russian show that MEC wh-words cannot even move out of embedded infinitival CPs (as opposed to wh-words in EQs) (Aysa Arylova, p.c.).

(8) a. Ja ne znaju [*čto* poobesčat’ [*t* počinit’ *t*]] EQ
 I not know what promise do
 ‘I don’t know what to promise to do.’

¹ Grosu (2004) can deal with this, as he places the existential quantifier into a specialized C-head and the wh-word in its specifier. It is still not quite clear, though, how the *neg-wh* complex can escape the embedded CP and appear in front of matrix adverbials.

- b. * Mne ne[*čego poobesčať [t počiniť t]]* MEC
 me_{DAT} not what promise do
 ‘There’s nothing I can promise to do.’

Another problematic aspect for the operator-approach is that MEC wh-words do not always need to move all the way to the left periphery of the vP/VP. When the MEC’s main predicate consists of a copula and an adjectival or nominal predicate, it is sufficient for the wh-word to move past the predicate, as the example from Czech illustrates.

- (9) a. Nemáš [_{VP} být [_{AP} na co pyšný]]
 not.have_{2SG} be on what proud
 ‘There’s nothing for you to be proud of.’
 b. Mám [_{VP} být [_{AP} komu učitelem]]
 have_{1SG} be whom teacher
 ‘There’s someone whose teacher I can be.’

The facts presented here significantly weaken the position that MEC wh-words are (relative) operators, even in the weaker sense of purely syntactic (i.e., not semantic) operators (cf. Berman 1991).

But why do MEC wh-words move at all, if they are no operators? It appears that the wh-movement in MECs resembles the movement of other non-specific indefinites. In Czech, this movement is obligatory for non-complex indefinites (such as *něco* ‘something’ as opposed to ‘some book’ or ‘something strange’); see (10b).

- (10)a. Mám si {co} koupit *{co} MEC
 have_{1SG} refl what buy what
 ‘There’s something that I can buy.’
 b. Můžeš si {něco} koupit *{něco} simple clause
 can_{2SG} refl something buy something
 ‘You can buy something.’

The question we need to ask is whether we can find any motivation for this movement. There is some evidence that Czech non-complex indefinites in post-predicate positions attract semantic focus. Consider the following minimal pair, involving the free-choice/negative-polarity indefinite *kýmkoli* ‘whoever/anyone’:

- (11)a. Popřel, [že by se s kýmkoli vyspal]_F
 denied that would REFL with anyone slept
 ‘He denied that he would sleep with anyone.’
- b. Popřel, že by se vyspal [s kýmkoli]_F
 denied that would REFL sleep with anyone
 ‘He denied that he would sleep with just anyone.’

It is well-known that negation associates with focus. In the examples above, the negation from the verb *popřel* ‘denied’ associates with the whole clause in (11a) but only with the free-choice component of *kýmkoli* ‘whoever/anyone’ in (11b). This shows that the indefinite in a post-predicate position is necessarily in narrow focus. In order for broad focus (focus on the whole clause) to be facilitated, the indefinite has to move. Importantly, the situation is similar in (Czech) multiple wh-questions, where a post-predicate interrogative wh-word obligatorily attracts focus.

- (12)a. Řekni mi, komu jsi s čím pomohl
 tell me who AUX_{2SG} with what help
 ‘Tell me whom you helped with what.’ (rhetoric)
- b. Řekni mi, komu jsi pomohl s čím
 tell me who AUX_{2SG} help with what
 ‘Tell me whom you helped with what.’ (true interrogative)

Only (12a) can be used in a rhetoric fashion, where the speaker knows that the addressee didn’t help anyone with anything. (12b), on the other hand, obligatorily triggers a presupposition that the addressee did help someone with something. Arguably, this presupposition is triggered by focusing the post-predicate wh-word *s čím* ‘with what’, and consequently putting the rest of the embedded clause in background. In Šimík (2008b), following Hagstrom (1998), I show that because the post-predicate interrogative wh-word is in focus, it is always selected by a focus-sensitive variable over choice functions, which in turn must be bound by an existential quantifier that takes CP-scope and facilitates an

interrogative interpretation.² It appears that if a *wh*-word is in a post-predicate position in MEC, it is forced to receive the same analysis, as it can only be interpreted interrogatively.³

- (13)a. Kdy jsi měl co komu darovat?
 when AUX_{2SG} have what who give
 ‘When was it that you could give something to someone?’
- b. ?Kdy jsi měl co darovat komu?
 when AUX_{2SG} have what give who
 ‘When was there was something you could give to whom?’
 *‘When was it that you could give something to someone?’

Thus, escaping narrow focus in MECs boils down to escaping interrogative interpretation.

1.3 Summary

We saw that Slavic MECs are to be analyzed as vPs rather than CPs. Despite the fact that the *wh*-word moves, the movement is not operator movement to the left periphery of the MEC. Rather than an operator, the *wh*-word is an indefinite and moves to the left of the main predicate in order to escape narrow focus, like other kinds of indefinites. By doing that, it also escapes an interrogative interpretation. I remain agnostic here as to what syntactic position the MEC *wh*-word moves to and whether it is adjoined or sits in the specifier of some projection. Arguably, this is a more general problem, which concerns the whole class of non-complex indefinites and which is therefore beyond the scope of this paper.

2 Analysis

In this section I propose an explicit implementation of the idea that MEC *wh*-words are not operators but indefinites. More particularly, I argue that they are Hamblin pronouns.

2 Placing the focus on the post-predicate *wh*-word also forces a pair-list (as opposed to single-pair) reading.

3 I believe that the reduced acceptability in (13b) stems from processing difficulties (and not e.g. because of the *wh*-extraction). Thanks to the fact that *měl* ‘had’ can also be interpreted as a deontic modal ‘supposed to’, the questions can also be interpreted as triple interrogatives ‘When were you supposed to give what to whom?’

2.1 Bare indefinites as Hamblin pronouns

Yanovich (2005) shows in his account of Russian indefinite pronouns that we need to distinguish between two broad classes of indefinites. One class takes the form [wh-base+affix], the other [wh-base]. Let us call the former a “plain indefinite” and the latter a “bare indefinite.” In both cases, the wh-base is analyzed as a “Hamblin pronoun,” i.e., a set of individuals (Hamblin 1973, Kratzer and Shimoyama 2002). Affixes generally express choice functions which take the wh-base as their argument and return an individual from the set that it denotes (see e.g. Kratzer 1998).

$$(14) \quad kto : [[\text{who}]] = \{x : \text{human}(x)\} (= \lambda x. \text{human}(x))$$

$$(15) \quad kto\text{-}to : [[\text{who}\text{-}\text{affix}]] = [[\text{affix}]]([\text{who}]] = f_{\langle \text{et}, \text{e} \rangle}(\{x : \text{human}(x)\})$$

Since a plain indefinite denotes an individual, it is directly composable with predicates that take individuals as arguments (e.g. *come*). A bare indefinite, on the other hand, requires a special composition rule, as it denotes a set of individuals. Hagstrom (1998) formulates the rule of *flexible functional application*, a tool of semantic composition that handles both standard and Hamblin cases. The idea is that whenever an individual-taking predicate encounters a set of individuals, it composes with each member of the set, yielding a set of values.

(16) Flexible functional application (Hagstrom 1998)

[[f a]] (where f and a are sisters) =

- i. f(a) or
 - ii. $\lambda m. \exists x[m = f(x) \ \& \ a(x)]$ or
 - iii. $\lambda m. \exists g[m = g(a) \ \& \ f(g)]$ or
 - iv. $\lambda m. \exists g \exists x[m = g(x) \ \& \ a(x) \ \& \ f(g)]$
- (whichever is defined)

The difference between *affix-who come* and *who come* ‘someone comes’ is that the former denotes a proposition (a set of worlds) and the latter a set of propositions (a set of sets of worlds). Note that (16) makes use of (16i) and (18) makes use of (16ii). The *f* below stands for the

choice function expressed by the affix.

- (17) $[[\text{come}(\text{who-affix})]] = \lambda w. \text{come}(f(\text{who}))(w)$
 (18) $[[\text{come}(\text{who})]] = \lambda p. \exists x. p = \text{come}(x) \ \& \ \text{who}(x)$

In order for (18) to become interpretable as an assertion, the set of propositions needs to be transformed into a proposition. We assume (with Yanovich 2005) that this is achieved by quantifiers, generally modals, that take Hamblin sets of propositions (such as (18)) and return propositions. E.g. *možet* ‘maybe’ is such a quantifier in Russian.⁴

- (19) For $\alpha \subseteq D_{\langle s, t \rangle}$,
 $[[\text{možet}(\alpha)]] = \lambda w[\exists w'. w'Rw \ \& \ \exists p. p \in \alpha \ \& \ p(w') = 1](w)$
- (20)a. *Možet kto prišel* (compare: **Kto prišel*)
 maybe who came
 ‘Maybe someone came’
 b. $[[\text{možet}(\text{prišel}(\text{kto}))]] = \lambda w[\exists w'. w'Rw \ \& \ \exists p \exists x. p \in \text{come}(\text{who}) \ \& \ \text{who}(x) \ \& \ p(w') = 1](w)$

This analysis makes a prediction concerning the scopal properties of *kto* and *kto-to*. The former must scope below its licenser (below the quantifier that “rescues” the sentence from uninterpretability), whereas the latter can be either bound by c-commanding quantifiers, or get valued by context (see also Geist 2008).

- (21)a. *Možet kto prišel.* Mod $>/*< \exists$
 maybe who came
 ‘Maybe someone came’
 b. *Možet kto-to prišel.* Mod $>/< \exists$
 maybe who-affix came
 ‘Maybe someone came’

4 I use a standard analysis of modals as quantifiers over world variables ranging over worlds accessible from the actual world (e.g. Kratzer 1977). The exact nature of the accessibility relation R is contextually determined.

2.2 Wh in MEC as a Hamblin pronoun

If we combine the empirical findings from section 2 with the reasoning about bare and plain indefinites from the preceding subsection, it seems natural to assume that the MEC wh-word is a Hamblin pronoun.

$$(22) \quad [[\text{who}_{\text{MEC}}]] = \{x : \text{human}(x)\}$$

I further assume that BE/HAVE in MEC is an existential (deontic) modal, analogous to the modal *možet* above.

$$(23) \quad \text{For } \alpha \subseteq D_{\langle s, t \rangle}, \\ [[\text{BE}/\text{HAVE}(\alpha)]] = \lambda w[\exists w'. w'Rw \ \& \ \exists p. p \in \alpha \ \& \ p(w') = 1](w)$$

In effect, an MEC like (24a) receives the interpretation in (24b).

- (24)a. Nemá kdo přijít
not.have_{3SG} who come
'There's noone who can come'
- b. $[[\text{Neg}(\text{HAVE}(\text{come}(\text{who})))] = \lambda w[\text{not } \exists w'. w'Rw \ \& \ \exists p \exists x. p \in \text{come}(\text{who}) \ \& \ \text{who}(x) \ \& \ p(w') = 1](w)$
- c. The proposition characterizes a set of worlds in which there is no accessible world where someone comes.

MECs under this analysis are conventionalized structures (constructions) that supply both the Hamblin pronoun (the wh-word) and its licenser (the modal BE/HAVE). The analysis directly predicts some familiar observations, e.g. the obligatory narrow scope of the MEC with respect to matrix negation or quantifiers, as illustrated below.

- (25)a. Nemám s kým jít na pivo
not.have with who go for beer
'There's no one for me to go for a beer with.'
* 'There is a certain person with whom I can't go for a beer.'
- b. Každému má kdo pomoci
everyone_{DAT} has who.nom help
'For everyone_i there is someone who can help him_i.'
* 'There is a certain person that can help everyone.'

It is also predicted that Slavic MEC can have multiple *wh*-words, an observation which is problematic for some CP-/operator-based approaches. Below I give examples from Czech (26) and Russian (27) (Aysa Arylova, p.c.); see Bošković (1998) for analogous Bulgarian examples.

(26) Mám komu co dát
 have_{1SG} whom what give
 ‘I can give something to someone.’

(27) Bylo komu čto zakazat’
 was whom what order
 ‘One could order something to someone.’

There is one aspect of the analysis, though, which may seem counterintuitive: the semantics of (28a) is now closer to (28b) than to (28c) – a usual paraphrase of the MEC.

- (28)a. Mám čím napsat ten dopis.
 have_{1SG} what_{INSTR} write the letter
 ‘I have something to write the letter with.’
- b. Můžu něčím napsat ten dopis.
 can_{1SG} something_{INSTR} write the letter
 ‘I can write the letter with something.’
- c. Mám něco, čím můžu napsat ten dopis.
 have_{1SG} something what_{INSTR} can_{1SG} write the letter
 ‘I have something with which I can write the letter.’

If we give the same semantic analysis to (28a) as to (28c), however (cf. Izvorski 1998, Caponigro 2003, Grosu 2004), the existential quantifier over individuals scopes over the modal. In effect, the existence of the individual that would/could be used to write the letter is (or at least *can be*) evaluated with respect to the actual world, rather than (one of) the possible worlds introduced by the modal. For (28c), this is indeed the correct analysis, but it does not work for the MEC. This can be shown by means of a discourse in which (28) is followed by (29).

- (29) Tady to je.
 here it is
 ‘Here it is.’

Crucially, the sentence in (29) can function as a continuation of (28c) and (28b), but not (28a). It appears that the MEC cannot establish a discourse referent independently of the worlds introduced by the modal, which could later be picked up by a pronoun, *to* ‘it’ in (29). This is readily captured by the present analysis, which forces the *wh*-word to scope below the modal.

2.3 *Open issues*

The analysis proposed here directly accounts for the radically narrow scope of MECs / the MEC *wh*-word. Below I suggest some possible ways of addressing some further issues.

2.3.1 *Type of modality.*

I have said nothing about what distinguishes (28a) from (28b); the current semantic machinery assigns them the same truth conditions (when the indefinite in (28b) scopes below the modal), which is counterintuitive. It is plausible, however, that BE/HAVE differs from standard modal verbs like ‘can’ or ‘may’ only in that it is lexically associated with a different *modal base* and/or *ordering source*, which are functions that determine which worlds are in the restriction of the modal (e.g. Kratzer 1991).

2.3.2 *Force of modality.*

All existing analyses, including the present one, stipulate that the force of modality in MECs is existential. Given that this is a cross-linguistic fact, we should look for a principled explanation. Note that it is insufficient to say that the predicates ‘be’ and ‘have’ often express existential quantification because when they are modal, they can be universal, too. One notable example is the English *have* + INF or the Czech *mit* ‘have’ + INF, which can mean ‘supposed (to)’ (see also footnote 3 and (13) above). It is possible that the existential interpretation relates to the fact that the modal necessarily associates with a non-specific (and in particular a Hamblin) indefinite. Pronouns and determiners belonging to a certain class of non-specific indefinites,

namely polarity and free choice items (like the English determiner *any*), are known to be dependent on certain types of operators. For example free choice items are typically licensed by existential but not universal modality (see e.g. Aloni 2007 for discussion).

(30) You can/*must buy anything.

This property is shared to some extent by the Russian Hamblin pronoun *kto* (cf. Yanovich 2005), which is licensed by the existential modal *možet* (see (20) above), but not by the universal *dolžno byt'* (Zhenya Markovskaya, p.c.).

(31) *Dolžno byt' kto prišel
 must be who came
 'Someone must have come'

We can therefore hypothesize that Hamblin pronouns are sensitive to something like a *variation requirement*, which seems to be lexically associated with free choice items and which is responsible for the fact that they are not licensed under universal modality (cf. Giannakidou 2001).

2.3.3 Restriction on *wh*-phrase complexity.

It has been observed that MECs are not acceptable with complex *wh*-phrases (Kondrashova 2008 for Russian, Rudin 1986:157 for Bulgarian, Grosu 2004 for Romanian and Hebrew). I give an example from Czech.

(32) *Mám si s kterým / jakým studentem promluvit
 have_{1SG} refl with which / what student talk
 'There is a student with whom I can speak'

Even though the present analysis remains silent about this, it enables us to look for a common explanation of (32) and bare non-specific indefinites in German (33) or Chinese (34) (from Cheng 1991:114), arguable candidates for the Hamblin pronoun analysis.

- (33) Will Hans was / * {welches Buch} kaufen?
 want Hans what / which book buy
 ‘Does Hans want to buy anything / any book?’
- (34) hufei hui mai shenme / *na-yi-ben-shu ma?
 Hufei will buy what / which-one-cl-book Qyes-no
 ‘Will Hufei buy anything / any book?’

This connection with bare indefinites in German and Chinese automatically falls out from the present proposal but can hardly be made explicit if MEC wh-words are operators.

3 Conclusion

This paper attempts to explain the long-standing observation that MECs behave in a similar way as non-specific NPs. First I argued that syntactically, MEC wh-words form a natural class with indefinites rather than (relative/interrogative) operators. Then I went on to propose that MEC wh-words are Hamblin pronouns. As such, they scope immediately below their licenser – a quantifier that turns Hamblin alternatives induced by the pronoun into a proposition. I argued that the licenser is the MEC-selecting verb BE/HAVE, which in effect receives the interpretation of an existential modal quantifier. This structural configuration makes the right prediction concerning the scopal relation between the MEC and the modality that it is obligatorily associated with. Finally, I sketched a way of approaching a number of MEC-related problems that have not been solved hitherto.

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A Case against ‘Defective’ Tense in the Bulgarian Subjunctive*

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1 The puzzle: the meaning of tense in subjunctive complements

Subjunctive complements in Bulgarian (BG) show unusual temporal properties when compared to corresponding indicative clauses. While present tense verbs in indicative matrix clauses are incompatible with past or future time adverbs, as in (1), these restrictions do not apply to present tense verbs in embedded subjunctive complements¹, as in (2):

- (1) **Pe-e** *utre /*včera.²
sing.IMPRFV-3SG.PRES *tomorrow/*yesterday.
‘He/she is singing *tomorrow/*yesterday.’
- (2) Nakara-x go [da **pe-e** utre /včera].
force.PRFV-1SG.PAST him DA sing.IMPRFV-3SG.PRES tomorrow/yesterday
‘I forced him to sing tomorrow/yesterday.’

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¹ BG does not have any special subjunctive morphology, and the only marker of the subjunctive complements is a modal particle *da*. However, these complements have a number of semantic properties which distinguish them from the indicative complements, most salient being their incompatibility with the past and future verb forms.

² I use the following glosses throughout the paper: IMPRFV=Imperfective Aspect, PAST=Past Tense, PRES=Present Tense, PRFV=Perfective Aspect, REFL=Reflexive.

In (1) the present tense verb *pee* 'he sings' locates the event of singing at the Speech Time (ST). This meaning is incompatible with the future and past time references introduced by the adverbs *utre* 'tomorrow' and *včera* 'yesterday', respectively. On the other hand, in (2), the same verb denotes an event which can either precede or follow the ST; hence both past- and future-oriented adverbs are acceptable. These data raise the following questions: i) what is the meaning of present tense verbs in subjunctive complements? ii) how is the temporal location of subjunctive complements determined?

In order to explain the difference between (1) and (2) one might assume that, unlike the present tense in indicative matrix clauses, which locates events at the ST, the present tense in embedded subjunctive complements does not have any semantic contribution. The reasoning along these lines would conform to the general tendency in the current syntactic literature, where tense in subjunctive complements is analyzed as 'defective' (e.g. Picallo 1984 on Romance subjunctives, Watanabe 1993 on Balkan subjunctives). With respect to the second question, one of the most common assumptions is that the temporal location of embedded subjunctive complements depends on control properties of the matrix verbs (e.g. Varlokosta & Hornstein 1993 on Modern Greek (MG), Krapova 2001 on BG).

Unlike previous proposals, I argue that the tense in subjunctive clauses is not 'defective' and show that the present tense in BG has the same meaning in indicative matrix clauses and in embedded subjunctive complements. Moreover, I show that the temporal location of the event denoted by a subjunctive clause does not depend on control properties of the matrix verb, but is entailed from the tense and semantic type of the main verb.

The paper is organized as follows: in section 2, I discuss problems with the previous analyses and show that the temporal location of subjunctive clauses does not depend on control. In section 3, I discuss the data which show that the temporal location of the subjunctive depends on the semantics of matrix verbs and on the matrix tense. In section 4, I i) show how the temporal location of subjunctive clauses is determined and ii) present a compositional semantic analysis which shows that the present tense is not defective. Section 5 concludes the paper and discusses its wider implications.

2 Previous analyses

In this section I discuss Krapova's 2001 analysis of subjunctive complements in BG and show that it makes incorrect predictions about the temporal location of subjunctive clauses. I also discuss analyses proposed by Varlokosta & Hornstein 1993 and Giannakidou 2007 for typologically-similar constructions in MG, and show that these analyses cannot be extended to BG.

Krapova 2001 proposes that subjunctive complements should be divided into two groups with respect to their temporal properties: i) complements which are located in the future with respect to the matrix event time (ET); ii) complements which overlap the matrix ET.³ Krapova assumes that the verbs in group (i) induce forward-shifted readings and those in group (ii) induce overlapping readings and that this difference correlates with the control properties of the matrix verb.⁴ Complements of Non-Obligatory Control (NOC) verbs, as in (3), "yield the 'unrealized future' interpretation invariably associated with this type of complement" (p. 117):

- (3) NOC verbs – forward-shifted reading:
 Nadjava-m se da dojde-š.
 Hope_{IMPRFV-1SG.PRES} REFL DA come_{PRFV-2SG.PRES}
 'I hope that you come.' (adapted from Krapova 2001, ex. (10a))

With Obligatory Control (OC) verbs, "temporal specification of the embedded event is identical to that of the main predicate" (p. 117):

- (4) OC verbs – overlapping reading:
 Znaj-a da pluva-m.
 know_{IMPRFV-1SG.PRES} DA swim_{IMPRFV-1SG.PRES}
 'I know how to swim.' (adapted from Krapova 2001, ex. (28a))

³ An underlying assumption of this proposal is that tenses in subjunctive complements are evaluated with respect to the matrix ET, not the ST.

⁴ Control properties of verbs are manifested through the referential properties of embedded subjects. Non-Obligatory Control verbs select for complements whose subjects might have split or generic antecedents, while subjects in complements of Obligatory Control verbs are strictly identified with an element of the matrix clause.

However, a closer look at the data shows that a generalization along these lines does not obtain. Examples in (5) and (6) show that both OC and NOC verbs allow forward-shifted readings:

- (5) NOC verbs – forward-shifted reading:⁵
 Ivan_i predlož-i na Maria_j [da pe-e_{ij} utre /včera].
 Ivan suggest_{PRFV-3SG.PAST} to Maria_{DA} sing_{IMPRFV-3SG.PRES} tom./yest.
 'Ivan suggested to Maria that he/she sing tomorrow/yesterday.'
- (6) OC verbs – forward-shifted reading:
 Ivan_i nakara-Ø Maria_j [da pe-e_{ij} utre/včera].
 Ivan force_{PRFV-3SG.PAST} Maria_{DA} sing_{IMPRFV-3SG.PRES} tom./yest.
 'Ivan forced Maria to sing tomorrow/yesterday.'

Moreover, contrary to the prediction of Krapova's analysis the overlapping interpretation is not restricted to complements of OC verbs, as in (7), but is also possible for complements of NOC verbs, as in (8):

- (7) OC verbs – overlapping reading:
 Prodālžav-a_i [da pe-e_{ij} sega].
 continue_{IMPRFV-3SG.PRES} DA sing_{IMPRFV-3SG.PRES} now
 'S/he continues to sing now.'
- (8) NOC verbs – overlapping reading:
 Straxuv-a se_i [da pe-e_{ij} sega].
 be.afraid_{IMPRFV-3SG.PRES} REFL DA sing_{IMPRFV-3SG.PRES} now
 'S/he is afraid of herself's/himself's/somebody else's singing.'

These data suggest that the temporal location of the embedded clause does not depend on the control properties of the matrix verbs.

Another aspect of Krapova's analysis which requires discussion relates to her assumption about the semantic content of the embedded tense. Krapova proposes that complements of NOC verbs have a contentful tense, and are specified as [+T]. On the other hand, complements of OC verbs "do not possess tense features at all" (p. 118),

⁵ I use subscripts to show control properties of matrix verbs.

and bear a [-T] specification.⁶ Since OC and NOC verbs can select complements with morphologically identical verbs, e.g. (5) vs. (6), (7) vs. (8), then the question arises of what mechanisms are responsible for the difference in the semantic content of the embedded tense. While Krapova does not discuss this question, there are two principled ways in which one might account for this difference. First, one might assume that there are two sets of present tense morphemes in BG, the ones which have a semantic content and the ones which do not. The tense morphemes with semantic content appear in indicative matrix clauses, in indicative complements, and in complements of NOC verbs. On the other hand, semantically vacuous tense morphemes appear in complements of OC verbs. However, such an analysis would posit an unmotivated asymmetry between complements of OC and NOC verbs. As an alternative explanation, one might suggest that the tense in subjunctive complements of OC verbs is deleted by some sort of the Sequence of Tense (SOT) rule, similar to the rule proposed by Ogihara 1996 for English. However, it is difficult to imagine what would require this mechanism to apply to complements of OC verbs, while preventing its application in complements of NOC verbs, especially in cases when the two constructions have an identical structure, as in (5) and (6) above. Moreover, BG, along with the majority of other Slavic languages is a non-SOT language.⁷ Thus, the existence of the deletion mechanism is unsupported in the first place.

Finally, what remains unanswered in Krapova's analysis is the question of how the temporal location of embedded subjunctive clauses

⁶ It is generally assumed that [-T] in OC constructions is responsible for the licensing of the Null case of the embedded subject PRO, while [+T] is taken to license the case of *pro*, the embedded subject of NOC constructions (e.g. Krapova 2001).

⁷ Ogihara 1996 proposes that the simultaneous reading in English past-under-past constructions as in (i) is due to the application of the SOT rule which deletes the semantic content of the embedded tense. The fact that the corresponding BG construction (ii) does not have the simultaneous reading suggests that BG does not have the SOT rule.

- (i) Ivan said that Mary was sick.
 a. Backward-shifted reading: Ivan said: "Mary was sick."
 b. Simultaneous reading: Ivan said: "Mary is sick."
- (ii) Ivan kaza-Ø če Maria be-še bolna
 Ivan say-PAST that Maria be-PAST sick
 'Ivan said that Maria had been sick.' (backward-shifted reading only)

is determined, in particular, what factors are responsible for the fact that the event of singing is located in the future in (5) and in (6)? While Krapova does not discuss this question, there are several proposals which one might adopt for BG. For example, one might adopt Varlokosta & Hornstein's 1993 analysis of typologically similar subjunctive constructions in MG.

Varlokosta & Hornstein argue that subjunctive complements in MG have an overlapping interpretation. However, this assumption is problematic for constructions with forward-shifted interpretation illustrated by BG examples in (5) and (6), which are also attested in MG. In order to account for these data, Varlokosta & Hornstein assume that forward-shifted readings are due to implicit temporal adverbs which shift the evaluation time forward. However, an analysis along these lines is ad hoc, and as I show in section 4.3, an alternative, non-stipulative solution to this problem is possible.

An alternative analysis is presented by Giannakidou's 2007 work on subjunctive complements in MG. Giannakidou proposes that the futurate and overlapping readings of subjunctive complements in MG arise as a consequence of the interactions between the meaning of the embedded non-past verbs and the semantic contribution of the modal particle *na*, the analogue of the subjunctive marker *da* in BG. Space limitations preclude a thorough review of the technical details of this analysis here, but what is crucial for the present discussion is that in her analysis a subjunctive complement can only be located in a time interval which starts at the ET of the matrix clause (attitude holder's now) and stretches into the future. While this proposal would account for the BG data presented above, we will see in section 3 that subjunctive complements in BG can also denote events which temporally precede the matrix clause ET, which makes a straightforward application of Giannakidou's analysis to the BG data untenable.

3 The dependency of the subjunctive: empirical generalization

The discussion of the previous literature leaves us with the following puzzle: if the temporal location of subjunctive complements does not depend on control properties of matrix verbs, then what are the mechanisms which determine whether a subjunctive complement would be located in the past or future with respect to the ST?

According to an empirical study of over 80 BG verbs selecting subjunctive complements, which was conducted to address the above question and whose results are reported in Smirnova 2008, selecting verbs should be divided into three different groups depending on whether the subjunctive event temporally precedes, follows, or overlaps with the matrix clause event. The largest class consists of verbs such as *iskam* ‘want’, *karam* ‘force’, *predlagam* ‘offer’ etc., which uniformly locate the embedded event in the future with respect to the matrix clause event. I call this group forward-shifting verbs.

(9) Forward-shifting verbs:

- a. Predlaga-m mu [da pe-e utre /*včera].
 offer_{IMPRFV-1SG.PRES} him_{DA} sing_{IMPRFV-3SG.PRES} tom./*yest.
 ‘I offer him to sing tomorrow/*yesterday.’
- b. Predlaga-x mu [da pe-e utre /včera].
 offer_{IMPRFV-1SG.PAST} him_{DA} sing_{IMPRFV-3SG.PRES} tom./yest.
 ‘I was offering him to sing tomorrow/yesterday.’

The second group of verbs consists of verbs such as *spomnjam si* ‘remember’ and *seštam se* ‘recollect’, which locate the subjunctive event in the past with respect to the matrix event. I call them backward-shifting verbs:

(10) Backward-shifting verbs:

- a. Spomnja-m si go [da pe-e *utre/včera].
 remember_{IMPRFV-1SG.PRES} REFL him_{DA} sing_{IMPRFV3SG.PRES} *tom./yest.
 ‘I remember him singing *tomorrow/yesterday.’
- b. Spomnja-x si go [da pe-e *utre /včera].
 remember_{IMPRFV-1SG.PAST} REFL him_{DA} sing_{IMPRFV-3SG.PRES} *tom./yest
 ‘I remembered him singing *tomorrow/yesterday.’

Finally, there is a group containing verbs such as *čuvam* ‘hear’ and *viždam* ‘see’. When subjunctive complements are selected by these verbs, the event denoted by the subjunctive complement must overlap with the event of the matrix clause. I call these verbs overlap-imposing.

(11) Overlap-imposing verbs:

- a. Čuva-m go [da pe-e *utre /*včera/sega].
 hear_{.IMPRFV-1SG.PRES} him_{DA} sing_{.IMPRFV-3SG.PRES} *tom./*yest./now
 'I hear him singing *tomorrow/*yesterday/now.'
- b. Čuva-x go [da pe-e *utre/včera/*sega].
 hear_{.IMPRFV-1SG.PAST} him_{DA} sing_{.IMPRFV-3SG.PRES} *tom./yest./*now
 'I heard him singing *tomorrow/yesterday/*now.'

Examples (9a) vs. (10a) vs. (11a) show that the temporal location of the embedded event depends on the type of the selecting verb. Since in these examples the tense of the main verb (present) and the tense of the embedded verb (present) are kept constant, and what varies is the type of the selecting verb, i.e. forward-shifting in (9a), backward-shifting in (10a), and overlap-imposing in (11a), then it is the type of the selecting verb which affects the temporal location of the embedded event.

Moreover, the contrasts in (9), (10), and (11) show that tense of the matrix verb is another factor that affects temporal interpretation of subjunctive complements. For example, with the present tense overlap-imposing verb *čuvam* 'hear', the event of singing must overlap the ST (11a), but when the same verb is in the past, the event of singing must be realized in the past with respect to the ST (11b). Note that in these examples the type of the matrix verb (overlap-imposing) and the tense of the embedded verb (present) are the same, and the only parameter that varies is the tense of the matrix verb. Therefore, the temporal location of singing in each case must be dependent on the matrix tense.

The data discussed in this section allow us to make the following empirical generalization:

(12) The temporal location of the subjunctive event depends on:

- (i) type of the selecting verb (i.e. forward-shifting, backward-shifting, or overlap-imposing)
- (ii) tense of the selecting verb

In the next section I propose an analysis which shows that the temporal location of the embedded subjunctive event follows from temporal information provided by the tense of the matrix verb, and its semantic type.

4 Analysis

4.1 Theoretical assumptions

Following Reichenbach 1947 and Klein 1994, I assume that tense and grammatical aspect encode the relations between three temporal parameters: the Speech Time, the Event Time, and the Reference Time. Tense and grammatical aspect are defined in terms of the precedence ($<$), the equivalence ($=$) and the subset (\subseteq) relations between these temporal intervals.

(13) Tense as a relation between the ST and the RT:

- a. Present: $ST=RT$ ⁸
- b. Past: $RT<ST$
- c. Future: $ST<RT$

(14) Grammatical aspect as a relation between the RT and the ET:

- a. Perfective: $ET\subseteq RT$
- b. Imperfective: $RT\subseteq ET$

The following example illustrates how these parameters interact in a simple sentence:

(15) Pe-e

sing.IMPRFV-3SG.PRES
'He/she is singing.'

(16) Temporal information:

- a. Present tense: $ST=RT_{sing}$
- b. Imperfective Aspect: $RT\subseteq ET_{sing}$
- c. $ST=RT_{sing}$ & $RT\subseteq ET_{sing}$ **entail** $ST\subseteq ET_{sing}$

⁸ I will argue in section 4.3 that the definition of tense as a relation between ST and RT is somewhat simplistic in light of the behavior of the present tense in BG in matrix clauses and embedded subjunctive clauses. I will propose an alternative view there that tense states relations between the RT and the 'evaluation time', i.e. the time with respect to which events are located in time, whose utility has been recognized in the literature on embedded tense. However, since this issue only becomes relevant when the meaning of tense in embedded contexts is considered, I keep to the simpler and more standard definition of tense in sections 4.1 and 4.2.

The two relations in (16a,b) entail $ST \subseteq ET_{\text{sing}}$, meaning that the singing event overlaps the time at which (15) is uttered.

In constructions with subjunctive complements, there are more times to consider, since the matrix and the embedded verbs each have their own ET and RT, so the number of temporal parameters rises to five (ET_{main} , RT_{main} , ET_{emb} , RT_{emb} , and ST). I assume that the temporal dependency between matrix verbs and subjunctive verbs, discussed in section 3, should be formulated as a relation between the RT of the embedded verb RT_{emb} , and the RT of the main verb RT_{main} (see Smirnova 2008 for the motivation of this analysis).⁹ Moreover, since the temporal location of the embedded event depends crucially on the semantics of the selecting verb, I assume that the relation between the RT_{main} and the RT_{emb} should be encoded in the meaning of the selecting verb as follows:

- (17) Temporal dependency between matrix and embedded verbs:
- a. Forward-shifting verbs (*force*): $RT_{\text{main}} < RT_{\text{emb}}$
 - b. Backward-shifting verbs (*remember*): $RT_{\text{emb}} < RT_{\text{main}}$
 - c. Overlap-imposing verbs (*hear*): $RT_{\text{emb}} = RT_{\text{main}}$

4.2 The temporal location of subjunctive clauses in time

In this section I show how temporal information contributed by the tense of the matrix verb and its semantic type entails the temporal location of the subjunctive event, stated as a relation between the ST and the RT_{emb} . From the discussion below, it might seem that the present tense in the subjunctive clause is not playing any role in determining the temporal location of the subjunctive clause. However, I will show in the next subsection that the meaning of the present tense can be defined *uniformly* as an identity function – a standard theoretical object in model-theoretic semantics. Thus, the present proposal subtly but crucially differs from a claim that the tense in subjunctive clauses is semantically 'defective'.

⁹ In the formal analysis that I present in section 4.3, the relation is actually stated between the RT_{main} and the evaluation time of the embedded clause (since the evaluation time is the only temporal parameter that can be accessed from outside the embedded clause in the compositional semantics). However, in all of the examples that I consider in this paper, the RT_{emb} happens to be identical to the evaluation time of the embedded clause (due to the fact that the embedded tense is present; see the analysis in 4.3). Since the main purpose of this section is to present the core of the analysis in semi-formal terms, I simply state the relevant generalizations in terms of the RT_{main} and the RT_{emb} .

The following is an example with the present tense forward-shifting verb.¹⁰

- (18) Kara-m go [da pe-e utre /*včera].
 force.IMPRFV-1SG.PRES him DA sing.IMPRFV-3SG.PRES tom./ *yest.
 'I force him to sing tomorrow/*yesterday.'

In (18) the event of singing must be located in the future with respect to the ST. Thus, the relation ($ST < RT_{\text{sing}}$) should be available during the semantic interpretation of this sentence. This relation follows from the semantic property of the matrix verb *karam* 'force' ($RT_{\text{force}} < RT_{\text{sing}}$) and its present tense ($ST = RT_{\text{force}}$):

- (19) $RT_{\text{force}} < RT_{\text{sing}}$ & $ST = RT_{\text{force}}$ entail $ST < RT_{\text{sing}}$ (Future)

When the same matrix verb appears in the past tense, the singing can be located in the past or future with respect to the ST:

- (20) Kara-x go [da pe-e utre / včera].
 force.IMPRFV-1SG.PAST him DA sing.IMERF-3SG.PRES tom./ yest.
 'I was forcing him to sing tomorrow/yesterday.'

The past ($RT_{\text{sing}} < ST$) and the future ($ST < RT_{\text{sing}}$) relations are entailed from the semantic contribution of the forward-shifting matrix verb ($RT_{\text{force}} < RT_{\text{sing}}$) and its past tense ($RT_{\text{force}} < ST$):

- (21) $RT_{\text{force}} < RT_{\text{sing}}$ & $RT_{\text{force}} < ST$ entail $RT_{\text{sing}} < ST$ (Past) OR
 $ST < RT_{\text{sing}}$ (Future)

This analysis shows that temporal location of events denoted by subjunctive complements directly follows from the temporal properties of matrix verbs, and not from any implicit temporal adverbs as in Varlokosta & Hornstein 1993.

¹⁰ Due to the space limitations I consider examples with forward-shifting verbs only. See Smirnova 2008 for the analysis of constructions with backward-shifting and overlapping verbs.

4.3 The meaning of the present tense: compositional semantic analysis

The analysis presented in the previous section leaves one question unanswered: if the temporal location of subjunctive clauses is derived from the semantic type of the selecting verb and its tense, then what is the semantic contribution of the embedded present tense? In this section I argue that the present tense in both indicative matrix clauses and embedded subjunctive clauses has the same semantic content, and show how the meanings of these sentences are derived compositionally.

If the meanings of tenses are defined by means of ST and RT, the present tense in (22) should denote $ST=RT_{\text{sing}}$.

- (22) Pe-e #utre
 sing.IMPRFV-3SG.PRES #tomorrow.
 'He/she is singing #tomorrow.'

However, the meaning of the same verb inside the subjunctive complement in (23) seems to be different:

- (23) Kara-m go [da pe-e utre /*včera].
 force.IMPRFV-1SG.PRES him DA sing.IMPRFV-3SG.PRES tom./*yest.
 'I force him to sing tomorrow/*yesterday.'

Unlike (22), the singing in (23) can be realized in the future with respect to the ST, so the relation between the ST and the RT should be $ST < RT_{\text{sing}}$. However, if the present tense directly encoded $ST=RT_{\text{sing}}$, as we have assumed in (16a), that would contradict the actually observed temporal relation in (23). The solution to this apparent problem comes from defining the meaning of (present) tense in a slightly different way. Specifically, I follow Gennari 2003, among others, and assume that the ST is not directly referred to in the meaning of the present tense per se. Rather, the present tense just identifies the RT of the clause with the 'evaluation time' ($RT = t_{\text{eval}}$), where t_{eval} is the temporal parameter with respect to which clauses are located in time.¹¹ When a present tense verb appears in a matrix clause, the evaluation time is identified with the ST

¹¹ See Kubota et al. (2009) for a detailed discussion of the notion of evaluation time and its application to the analysis of interpretation of embedded tense cross-linguistically.

($ST = t_{eval}$), so that the event denoted by this verb is interpreted with respect to the ST, which yields the desired effect that the ST and the RT are identified ($ST=RT$). But, crucially, that identification comes about only *indirectly* by means of an interaction of separate factors.

This analysis can be formally implemented by assuming that the present tense denotes an identity function¹² of type $\langle\langle i, t \rangle, \langle i, t \rangle\rangle$:

(24) Present tense: $[[PRES]] = \lambda P \lambda t [P(t)]$

In (24), t is just a temporal variable, which can, but does not have to be identified with the ST.

The derivation of a simple sentence in (22) proceeds as follows: the denotation of the sentence radical,¹³ i.e. ‘he sing’ in (25a), which is of type $\langle i, \langle ev, t \rangle \rangle$ ¹⁴, serves as an argument to the Imperfective Aspect (25b), of type $\langle\langle i, \langle ev, t \rangle \rangle, \langle i, t \rangle\rangle$. The result is taken as an argument by the Present Tense.

(25) a. Sentence radical: $\lambda t' \lambda e' [sing'(t', e', x)]$, where $t' = RT_{sing}$
 b. Imperfective Aspect: $\lambda Q \lambda t' \exists e' [Q(t', e') \ \& \ t' \subseteq \tau(e')]$

(26) Semantic derivation of (22):

$$\begin{array}{l} \lambda t \exists e' [sing'(t, e', x) \ \& \ t \subseteq \tau(e')] \\ \text{Tense: } \lambda P \lambda t [P(t)] \quad \lambda t' \exists e' [sing'(t', e', x) \ \& \ t' \subseteq \tau(e')] \\ \text{Aspect: } \lambda Q \lambda t' \exists e' [Q(t', e') \ \& \ t' \subseteq \tau(e')] \quad \lambda t \lambda e [sing'(t, e, x)] \end{array}$$

The temporal variable t bound by the lambda operator in the resultant formula in (26) designates the evaluation time of the matrix clause. The $ST=s^*$ is supplied as an argument to this expression when the sentence is interpreted in the discourse, yielding (27) as the final interpretation:

¹² I thank Yusuke Kubota for helping me with this part of the analysis.

¹³ By ‘sentence radical’ I mean the denotation of the clause before the application of the Aspect and Tense.

¹⁴ Here i , ev and t are types for time, eventuality description and truth value, respectively.

$$(27) \quad \exists e' [sing'(s^*, e', x) \& s^* \subseteq \tau(e')]$$

According to (27), there exists an event of an individual x 's singing, which happens at the ST. Crucially, while the ST is not a part of the meaning of the present tense, the meaning given in (27) conveys the same information, i.e., $ST \subseteq ET_{sing}$, as in the framework in which the ST is introduced by the tense, as in (16).

Thus, looking at the matrix environments alone, there does not seem to be any substantial difference between the present proposal and the more standard Reichenbachian view. However, the difference between the two becomes clear once embedded environments are brought into the picture. Specifically, for the present tense in BG, a unified analysis that covers both the matrix indicative clauses and the embedded subjunctive clauses is only possible by *not* including the reference to the ST in the meaning of the tense itself.

Regarding the meaning of tense in the subjunctive complement in (23), I assume that the present tense in this example has the same meaning as in (22), namely, it denotes an identity function given in (24). The derivation of (23) would proceed as in (26), up to the point at which the embedded clause combines with the sentence radical of the matrix clause, which has the meaning in (28):

$$(28) \quad [[I\text{-force}]] = \lambda P \lambda t \lambda e \exists t' [force'(t, e, sp, P(t')) \& t < t']^{15},$$

where sp = speaker, $t = RT_{main}$, $t' = RT_{emb}$, and $t < t'$ encodes that forcing precedes singing temporally.

¹⁵ As pointed out by an anonymous reviewer, the existential quantifier outside the scope of the predicate 'force' entails that there exists some specific time in the future at which the embedded event takes place. A possible solution would be to redefine the meaning of the verb 'force' as in (i), and assume that the order between the matrix and the embedded event is taken care of by the meaning postulate in (ii):

(i) $[[force]] = \lambda P \lambda t \lambda e [force'(t, e, sp, P)]$

(ii) $force'(t, e, x, P) \models \exists t'[P(t') \& t < t']$

I thank Yusuke Kubota for pointing out this alternative to me.

(29) (Partial)¹⁶ semantic derivation of (23):

$$\lambda t \exists e' \exists t''' [force'(t, e', sp, \exists e [sing'(t''', e, x) \& t''' \subseteq \tau(e)]) \& t < t''' \& t \subseteq \tau(e')]$$

$$\lambda P \lambda t \lambda e'' \exists t''' [force'(t, e'', sp, P(t''')) \& t < t'''] \quad \lambda t' \exists e [sing'(t', e, x) \& t' \subseteq \tau(e)]$$

The result of semantic derivation, applied to the ST yields (30):

$$(30) \quad \exists e' \exists t''' [force'(s^*, e', sp, \exists e [sing'(t''', e, x) \& t''' \subseteq \tau(e)]) \& s^* < t''' \& s^* \subseteq \tau(e')]$$

According to (30), there exists an event of the speaker forcing an individual x to sing, which happens at the ST, and the event of singing is located in the future with respect to the ST. Note that in this case, the temporal variable introduced by the present tense morpheme is *not* identified with the ST which does not serve as the local evaluation time of the embedded tense, but is instead simply existentially quantified as specified in the meaning of the sentence radical of the matrix clause in (28). The result of the semantic derivation in (29) is applied to the ST. The relation $s^* < t'''$, i.e. $ST < RT_{sing}$, which results from this application signals that singing is located in the future with respect to the ST, what is exactly the meaning of (23).

5 Conclusions and wider implications

In this paper I have argued that the present tense in embedded subjunctive clauses is not defective semantically, and that it has the same meaning as the present tense in indicative matrix clauses. The uniform analysis is possible because of the assumption that the ST is not directly encoded in the meaning of the present tense, and that the present tense denotes a relation between the RT and the time of evaluation, which has been recognized in the literature dealing with the question of embedded tense. Moreover, I have shown that the temporal location of embedded

¹⁶ In the bottom line in (29), the sentence radical of the matrix clause applies to the denotation of the embedded clause. The result of this application first combines with the matrix Aspect, and then with the matrix Tense (these steps are skipped in (29), but see the appendix for the details of the compositional analysis).

subjunctive clauses in BG is not dependent on control, as suggested by Krapova's 2001 analysis, but follows from the semantic properties of matrix verbs and the meaning of the matrix tense. One of the theoretical consequences of this analysis is that tense in NOC and OC complements has the same meaning, so that the syntactic distinction between [+T] and [-T] becomes unmotivated, which in turn challenges the claim that *pro* in NOC, and PRO in OC complements are licensed by the [+T] node, and by the [-T] node respectively.

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APPENDIX: Formal analysis

Tense: a. [[PRES]] = $\lambda P \lambda t [P(t)]$ b. [[PAST]] = $\lambda P \lambda t' \exists t [P(t) \ \& \ t < t']$

Aspect: [[Imperfective]] = $\lambda Q \lambda t' \exists e' [Q(t', e') \ \& \ t' \leq \tau(e')]$

Sentence radicals:

a. Embedded verbs: [[sing]] = $\lambda t \lambda e [sing'(t, e, x)]$, where $t = RT_{sing}$

b. Embedding verbs, where $t = RT_{main}$, $t' = RT_{emb}$, $sp = speaker$:

Forward-shifting verbs: [[I force]] = $\lambda P \lambda t \lambda e \exists t' [force'(t, e, sp, P(t')) \ \& \ t < t']$

Back-shifting verbs: $[[I \text{ remember}]] = \lambda P \lambda t \lambda e \exists t' [remember'(t, e, sp, P(t')) \& t' < t]$

Overlap-imposing verbs: $[[I \text{ hear}]] = \lambda P \lambda t \lambda e \exists t' [hear'(t, e, sp, P(t')) \& t' = t]$

- (1) Kara-m go [da pe-e].
 force.IMPRF-1SG.PRES him DA sing.IMPRF-3SG.PRES
 'I force him to sing.'

The order of morpheme application:

$TENSE_{main} [ASP [V_{main} [TENSE_{emb} [ASP [V_{emb}]]]]]$

Semantic Derivation of (1):¹⁷

1. $[[he-sing']] = \lambda t' \lambda e' [sing'(t', e', x)]$
2. $[[Imperfective Aspect]] = \lambda Q \lambda t \exists e [Q(t, e) \& t \subseteq \tau(e)]$
3. $[[Asp ([[1]])]] = \lambda t \exists e [sing'(t, e, x) \& t \subseteq \tau(e)]$
4. $[[PRES]] = \lambda P \lambda t [P(t)]$
5. $[[PRES ([[3]])]] = \lambda t' \exists e [sing'(t', e, x) \& t' \subseteq \tau(e)]$
6. $[[I-force']] = \lambda P \lambda t \lambda e'' \exists t''' [force'(t, e'', sp, P(t''')) \& t < t''']$
7. $[[I-force' ([[5]])]] = \lambda t \lambda e'' \exists t''' [force'(t, e'', sp, \exists e [sing'(t''', e, x) \& t''' \subseteq \tau(e)]) \& t < t''']$
8. $[[Imperfective Aspect]] = \lambda Q \lambda t' \exists e' [Q(t', e') \& t' \subseteq \tau(e')]$
9. $[[Asp ([[7]])]] = \lambda t' \exists e' \exists t''' [force'(t', e', sp, \exists e [sing'(t''', e, x) \& t''' \subseteq \tau(e)]) \& t' < t''' \& t' \subseteq \tau(e')]$
10. $[[PRES]] = \lambda P \lambda t [P(t)]$
11. $[[PRES ([[9]])]] = \lambda t \exists e' \exists t''' [force'(t, e', sp, \exists e [sing'(t''', e, x) \& t''' \subseteq \tau(e)]) \& t < t''' \& t \subseteq \tau(e')]$, which applied to the $ST=s^*$ yields:
12. $\exists e' \exists t''' [force'(s^*, e', sp, \exists e [sing'(t''', e, x) \& t''' \subseteq \tau(e)]) \& s^* < t''' \& s^* \subseteq \tau(e')]$

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¹⁷ For the sake of simplicity I present an extensional analysis, leaving out the world variables.

Obviation in Russian and Polish Subjunctive Clauses*

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1 Introduction

In this paper, I will discuss the phenomenon of obviation, i.e. obligatory disjoint reference of matrix and embedded subjects with volitional matrix verbs embedding subjunctive clauses. Beside obviation, throughout the literature, it has been observed that subjunctive clauses selected by volitional verbs allow for certain syntactic phenomena to occur in a less local domain than is observed with other types of subordinate clauses (especially indicative clauses). Due to space limitations I will focus on obviation often attributed to 'domain extension' collapsing the tense domains of the matrix and the embedded clause and subsequent Principle B violations in those cases where the embedded subject is co-indexed with the matrix subject. I will mainly discuss Polish and Russian data.

The domain extension analysis is supported by the fact that subjunctive clauses show temporal dependencies with respect to the matrix

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In this article, I use the following abbreviations: 1, 2, 3 = first, second, third person; A = accusative; ADV = adverb(ial); BCS = Bosnian/Croatian/Serbian; CL = pronominal clitic; COP = copula; D = dative; f = feminine; FUT = future auxiliary; G = genitive; INF = infinitive; LPT = *l*-participle; m = masculine; n = neuter; N = nominative; NEG = negation particle/marker; Q = question particle; PL = plural; Po = Polish; PP = passive participle; PRF = perfect auxiliary; PRS = present tense; PST = past tense; REFL = reflexive (clitic); Ru = Russian; SBJV = subjunctive; SG = singular; Sp = Spanish.

clause (cf. Picallo 1985; Progovac 1993a, 1993b; Krapova 2001; Oshima 2003, 2004 among others for details especially with respect to Romance and Slavic languages). This is also true for Polish and Russian, where the verb within embedded subjunctive clauses can only bear past tense morphology (combined with a non-factual marker on C). However, evidence from Bosnian/Croatian/Serbian (BCS) is more telling. In BCS, volitional verbs like other propositional verb classes (e.g. declarative verbs) canonically have indicative complements introduced by *da* (sometimes translated and glossed as ‘that’). As complements of declarative verbs (e.g. ‘verba dicendi’ like *reći* ‘say’), indicative *da*-clauses are not temporally restricted and may occur with past tense morphology (perfect) and future tense, cf. (1b) and (1c) respectively. In contrast, subjunctive complements of volitional verbs (‘verba voluntatis’ like *željeti/želeti* ‘wish’) are restricted to morphological present tense which might be taken to be a morphological default, cf. the contrast in (2).

- (1) a. Reka-o je da dolaz-e. [BCS]
 say_{LPT-m:SG} PRF_{3:SG} *da* come_{PRS:3:PL}
 ‘He said that they are coming.’
- b. Reka-o je da su doš-l-i.
 say_{LPT-m:SG} PRF_{3:SG} *da* PRF_{3:PL} come_{LPT-m:PL}
 ‘He said that they came.’
- c. Reka-o je da će do-ći.
 say_{LPT-m:SG} PRF_{3:SG} *da* FUT_{3:PL} come_{INF}
 ‘He said that they will come.’
- (2) a. Ne želi-m da ostane-m.
 NEG want_{PRS:1:SG} *da* stay_{PRS:1:SG}
 ‘I don’t want to stay.’
- b. *Ne želi-m da sam osta-o.
 NEG want_{PRS:1:SG} *da* PRF_{1:SG} stay_{LPT-m:SG}
- c. *Ne želi-m da ću osta-ti.
 NEG want_{PRS:1:SG} *da* FUT_{1:SG} stay_{INF} (cf. Progovac 1993a)

Data from Romance languages showing temporal dependencies (cf. Picallo 1985, Tsoulas 1996, Dobrovie-Sorin 2001, Costantini 2005 among many others) support the view that the verbal temporal/modal markers in subjunctive clauses are not able to temporally locate the event denoted by the respective proposition. It is often claimed that the tempo-

ral/modal morphology in subjunctive clauses represents an unspecified, defective/deficient or non-existing temporal feature yielding the above-mentioned “anaphoric” interpretation meaning that this interpretation depends on the temporal interpretation of the matrix clause. The same can be said about infinitival clauses which also represent “unrealized time” as claimed by Costantini (2005).

One line of analyses to account for obviation is to take subjunctive T and/or C to be permeable due to the deficiency of its morphological specification. This deficiency causes domain collapse (cf. Picallo 1985, Oshima 2003, 2004), LF-deletion of the Infl/T-node and the C-node (cf. Progovac 1993a, 1993b), or operator movement out of the subjunctive into the matrix clause (Avrutin and Babyonyshev 1997; hereafter A&B), depending on respective theoretical assumptions. However, these analyses run into empirical problems (cf. below). Due to space limitations, I will discuss them only briefly. Note that my alternative basically proceeds from the same findings concerning temporal dependencies between subjunctives and matrix clauses.

In contrast to previous proposals, the present one does not collapse whole clauses or all functional categories of both the matrix and the subjunctive clause, but rather relies on the idea that it is temporal features which are shared by subjunctive C-T and matrix C-T complexes forming long distance ‘feature chains’ (cf. Pesetsky and Torrego 2006, 2007 for details concerning feature sharing). This move links only the categories of the matrix and the subjunctive clause bearing T-features, viz. C and T, and all categories stepping into a substantial T-feature relation with the abovementioned categories, viz. DPs AGREEing with T (i.e. ‘subjects’).

In order to establish cross-clausal feature sharing, certain requirements of volitional matrix verbs have to be met. In contrast to other verb classes, the temporal feature of volitional verbs contains an open slot to be filled by the T-feature of the embedded clause. This selectional requirement includes information on the type of the T-feature of the complement clause: The feature has to be deficient (subjunctive morphology). Furthermore, volitional verbs select for complement clauses whose C is overtly marked by the abovementioned deficient temporal/modal marker. Thus, for obviation to occur it is not sufficient that the embedded clause contains a marker for non-factuality. It is also necessary that this marker is accessible for matrix V, i.e. that it sits on C of the complement clause.

2 Obviation in Russian and Polish

In this section, I will present the relevant data concerning obviation in subjunctive clauses in Russian and Polish. In those languages which exhibit obviation, the requirement for disjoint reference in subjunctive clauses is restricted to subjects: the subject of the subjunctive clause cannot be coreferent with the subject of the matrix clause. Coreference of the subject of the complement clause with the subject of a volitional matrix clause is only possible with infinitival complements. Thus, with clausal complements of volitional verbs, there is a complementary distribution of finite (non-factual) clauses and infinitival clauses, cf. (3) and (4) for Russian and Polish.

- (3) a. Volod-ja_i xóče-t, čto-by on_{*i/j} pocelova-l Nad-ju. [Ru]
 Volodja_{m:SG:N} want_{PRS:3:SG} that_{SBJV} he_N kiss_{PST-m:SG} Nadja_{f:SG:A}
 ‘Volodja wants him to kiss Nadja.’
- b. Volod-ja_i xóče-t PRO_{i/*j} pocelova-t' Nad-ju.
 Volodja_{m:SG:N} want_{PRS:3:SG} PRO kiss_{INF} Nadja_{f:SG:A}
 ‘Volodja wants to kiss Nadja.’ (cf. A&B: 230)
- (4) a. Jarek_i chc-e, że-by pro_{*i/j} śpiewa-ł. [Po]
 Jarek_{m:SG:N} want_{PRS:3:SG} that_{SBJV} pro sing_{LPT-m:SG}
 ‘Jarek wants him to sing.’
- b. Jarek_i chc-e PRO_{i/*j} śpiewa-ć.
 Jarek_{m:SG:N} want_{PRS:3:SG} PRO sing_{INF}
 ‘Jarek wants to sing.’

In Russian and Polish, this disjoint reference requirement is totally absent in the context of indicative complement clauses, cf. the examples in (5), and also in certain types of subjunctive clauses (e.g. complements of epistemic verbs, cf. (10) below).

- (5) a. Volod-ja_i skaza-l, čto on_{i/j} pocelova-l Nad-ju. [Ru]
 Volodja_{m:SG:N} say_{PST-m:SG} that he_N kiss_{PST-m:SG} Nadja_{f:SG:A}
 ‘Volodja said that he kissed Nadja.’ (cf. A&B: 231)
- b. Jarek_i mów-i, że pro_{i/j} czyta-ł książk-ę. [Po]
 Jarek_{m:SG:N} say_{PRS:3:SG} that pro read_{LPT-m:SG} book_{f:SG:A}
 ‘Jarek says that he read the/a book.’

Canonically, a finite clause is considered to be one of the relevant domains for Binding Principle A and B. So, in (5), the pronominal subjects behave as expected: The subject pronoun of finite embedded clauses can be optionally co-indexed with a c-commanding nominal expression in the respective matrix clause. Thus, the problematic case to be accounted for is rather the ban of such an co-indexation with subjects of certain embedded subjunctive clauses.

Most analyses of obviation effects in Slavic and other languages put the explanatory burden on the temporal dependency of the subjunctive clause with respect to the volitional matrix clause caused by the temporal deficiency of the former. Often these analyses involve the extension of the domain for binding of the pronominal subject of the subjunctive clause. Several accounts have been developed over the last two decades which sometimes differ quite significantly with respect to technical details. The main consequences, however, are similar in a lot of studies on obviation. In these accounts, the Tense category (T, I[nfl], sometimes including possible Mood categories) and/or the C category are taken to be deficient or marked as irrealis/non-factual by modal markers. This under- or non-specification for temporal features produces the above-mentioned anaphoric temporal interpretation (temporal dependency).

The exact syntactic implementation of this deficiency varies in each approach. It ranges from actual domain extension as in Picallo (1985), and deletion of C- and T-nodes as in Progovac (1993a, 1993b) to operator movement from the subjunctive clause into the matrix clause (A&B) and “phase collapse” due to cross-clausal head movement as in Oshima (2003, 2004). As a consequence the relation between the pronominal subject of the embedded clause and the matrix subject happens to be too local for coreference to be possible.

Most of the abovementioned analyses simply assume the extension of the binding domain. This assumption produces correct results for the standard cases discussed so far. There are, however, also more problematic cases which don't seem to be covered by simply extending the relevant domain, as has been pointed out by A&B. The first problematic case discussed by A&B probably is not counterevidence against the domain extension analysis at all. It involves pronominal objects which may be co-indexed with the matrix subject, cf. (6) for Russian.

- (6) Ivan_i xoč-et, čto-by Nad-ja pocelova-l-a ego_i. [Ru]
 Ivan_{m:SG:N} want_{PRS:3:SG}that_{SBJV} Nadja_{f:SG:N} kiss_{PST-f:SG} he_A
 ‘Ivan wants Nadja to kiss him.’ (cf. A&B: 232)

To account for cases as (6), Oshima (2003, 2004) assumes that the Minimal Link Condition also governs the requirement for disjoint reference.¹ According to him, the subject of the embedded clause (which itself cannot be co-indexed with the pronominal object) “blocks” Condition B from applying to the pronoun with respect to the matrix subject by being closer to the pronoun than the matrix subject.

It is more difficult, however, to adjust the domain extension/phase collapse account to the cases in (7), (8) and (9) also discussed in A&B. The sentence in (7) exemplifies the unexpected case that non-subjects within the volitional matrix clause actually can be co-indexed with the subject of the subjunctive clause.

- (7) Volod-ja ugovori-l Nad-ju_i, čto-by ona_i [Ru]
 Volodja_{m:SG:N} persuade_{PST-m:SG} Nadja_{f:SG:A} that_{SBJV} she_N
 poexa-l-a v Evrop-u.
 go_{PST-f:SG} in Europe_{f:SG:A}
 ‘Volodja persuaded Nadja to go to Europe.’ (cf. A&B: 233)

By analogy to the case in (3a), the pronominal subject of the subjunctive clause and the object of the matrix clause belong to the same binding domain. The DP *Nadju* is hierarchically even closer to the embedded subject than it is the case with the matrix subject in (3a).

Furthermore, syntactically prominent pronouns within subjunctive clauses which may be co-indexed with the matrix clause pose a problem for simplified domain extension analyses. So, obviation effects obviously do not extend to dative Experiencer-DPs within subjunctive clauses as in (8) and (9), although these sentences also do not seem to involve potential interveners disrupting the disjoint reference requirement between the

¹ An anonymous reviewer pointed out the fact that effects of closeness (or a relativized definition of binding domain) can be observed with embedded infinitives, too. In English, only the subject of ECM clauses can be bound by the matrix subject, not the object, cf. (i) in contrast to (ii). The latter can be bound only by the embedded subject, cf. (iii).

- (i) John expects himself to visit Mary.
 (ii) * John expects Mary to visit himself.
 (iii) Mary expects John to visit himself.

pronouns and the matrix subject.²

- (8) Volod-ja_i xoč-et, čtoby emu_i by-l-o vesel-o. [Ru]
 Volodja_{m.SG:N} want_{PRS:3:SG}that_{SBJV} he_D COP_{PST-n:SG} funny_{ADV}
 ‘Volodja wants to be having fun.’ (cf. A&B: 236)
- (9) Jarek_i chc-e, że-by mu_i by-ł-o ciepł-o. [Po]
 Jarek_{m.SG:N} want_{PRS:3:SG}that_{SBJV} CL_{m:3:SG:D} COP_{LPT-n:SG} warm_{ADV}
 ‘Jarek wants to be warm.’

To account for the abovementioned problematic cases, A&B propose an alternative account for Russian subjunctives which relies on three assumptions: First, in order to take scope over the matrix clause, the subjunctive complementizer *čtoby* ‘that’ is assumed to contain an event operator which has to covertly move into the complementizer-domain of the matrix clause.³ This requirement yields cross-clausal head-movement at LF. As a result, all the heads within the extended verbal projections of the embedded clause end up in the C-domain of the matrix clause forming a complex head by successive head adjunction, i.e., at LF, matrix C contains the functional and non-functional verbal heads both of the matrix clause *and* the embedded clause. The initial driving force for this process in subjunctive clauses is the properties of the subjunctive complementizer (*čtoby* in Russian and *żeby(-m, -ś, ...)* in Polish) containing the event operator mentioned in footnote 3.

Second, A&B assume that DPs marked with structural case licensed by a functional category are co-indexed with the respective categories. Applied to finite transitive clauses, this amounts to the claim that the DP originally generated in Spec-of-*v*P (the external argument) is co-indexed with the category licensing the nominative: T (or Agr_S in A&B), whereas internal argument DPs are co-indexed with the category licensing the accusative: *v* (or Agr_O in A&B). This idea can be restated within the framework of Pesetsky and Torrego (2004, and especially 2006, 2007). The latter assume that structural case features are T-features on D which establish a feature relation with the T-features of T and *v* respectively.

² For more problematic cases cf. A&B.

³ This step is motivated by the temporal interpretation of subjunctive clauses. A&B assume that the events of the matrix and the subjunctive clause have to be “co-bound” to render temporal ordering. This is achieved by an event operator originally located within embedded C moving to matrix C and thereby taking scope over both events.

All members of such a relation represent “instances” of one feature “occurrence”. Ultimately, the interpretable but unvalued T-feature of T (or ν) is valued by uninterpretable but valued features on (ν)-V. With respect to the (finite) T-node and to nominative (= T-feature of D), the T-feature occurrence (T-feature chain) contains three feature instances (on T, on D, and on V), cf. also section 3.

The third assumption made by A&B is that in Russian and other Slavic languages T (their Agr_S) is a pronominal category.⁴ This assumption is an important ingredient for their analysis of obviation. T (Agr_S) sharply contrasts with ν (their Agr_O) which is taken to be non-pronominal. According to A&B, T (Agr_S) of the subjunctive clause is locally c-commanded by T (Agr_S) of the matrix clause, because the former moves to the matrix clause. Since T (Agr_S) is claimed to be a pronominal category, matrix and embedded T (Agr_S) would violate Principle B if co-indexed. Furthermore, by transitivity the subjects of the respective clauses also cannot be co-indexed, since they are co-indexed with their respective clause-mate T (Agr_S). As far as ν (Agr_O) is concerned, no problems arise, since this category is claimed not to be pronominal. Hence, no Principle B violation is possible, which accounts for the fact that obviation effects only occur with subjects.

As already mentioned, A&B put the whole burden for establishing the abovementioned temporal dependency on the event operator represented by the complementizer *čtoby* (Ru) or *žeby* (Po). Embedded subjunctive clauses do not get an independent temporal interpretation, and it is the event operator which causes covert movement of verbal heads to the matrix clause. There are, however, non-volitional verb classes (e.g., epistemic verbs) which may—in languages like Spanish productively, in others (e.g. Russian) at least marginally—appear with subjunctive embedded clauses, but which still do not exhibit obviation effects, cf. (10) and (11) for Russian and Spanish.

⁴ This claim is motivated by the fact that T in all Slavic languages (including Russian) allegedly licenses null-subjects (*pro*-s). This assumption is certainly true for languages like BCS, Slovenian or Czech. However, Franks (1995) provides evidence against an analysis of Russian as a canonical *pro*-drop-language. Besides, there are clear non-*pro*-drop languages (e.g. French) which nevertheless exhibit the same obviation phenomena as clear-cut *pro*-drop languages. Following the reasoning presented above, T (Agr_S) in French should not be pronominal and obviation should not occur.

- (10) Nad-ja_i somneva-et-sja, što-by ona_i [Ru]
 Nadja_{f:SG:N} doubt_{PRS:3:SG-REFL} that_{SBJV} she_N
 vyš-l-a замуž za Feliks-a.
 go_{PST-f:SG} married for Felix_{m:SG:A}
 'Nadja doubts that she would marry Felix.' (cf. A&B: 238)
- (11) *pro*_i Dud-a, que *pro*_{ij} teng-a dinero suficiente. [Sp]
pro doubt_{PRS:3:SG} that *pro* have_{SBJV:3:SG} money enough
 'S/he doubts that s/he has enough money.'

To account for these cross-linguistically consistent cases, A&B stipulatively claim that with epistemic verbs there is no need for the operator to bind the matrix event, since epistemic verbs impose no requirement for a specific temporal interpretation (temporal ordering). This amounts to shifting the burden back to selectional requirements of the matrix verb selecting for non-factual embedded clauses.

3 Temporal Dependency and Cross-clausal Feature Sharing

In my analysis, I build on the work of A&B by emphasizing the role of certain functional categories for establishing both the abovementioned temporal dependencies and the disjoint reference requirement for subjects of subjunctive complement clauses of volitional verbs. I depart from their assumptions in three crucial points: (i) I do not take certain functional categories to be pronominal or non-pronominal, hence avoiding false empirical predictions with respect to languages which should exhibit obviation and those which should not (cf. footnote 4), (ii) I do not assume cross-clausal head movement which is cross-linguistically not attested as an overt operation (cf. Oshima 2004), and (iii) I do not take the properties of the embedded complementizer (more precisely: the embedded T-feature, cf. A&B's event operator) to be the initial driving force for cross-clausal dependencies (including obviation) but rather selectional properties of the matrix verb alone, thus minimizing stipulations.

So, one cornerstone of my account is differing selectional requirements of matrix verb classes. Some verb classes not only select for categorial features of their complements but also for other types of features their (clausal) complements have to contain. More precisely, I assume that selectional properties of matrix verbs may include information on the type of temporal features to be contained within complement clauses.

These selectional requirements may cause AGREE-relations (feature sharing) between the matrix verb and its complement involving T-features of both syntactic terms. As all other AGREE-relations, these relations have to obey locality restrictions (cf. below for details).

Furthermore, I adopt general considerations concerning the nature of feature relations developed by Pesetsky and Torrego (2006, 2007). In particular, I assume that AGREE-relations cause features of the same type involved in such a relation to be identified (the feature is shared by the respective categories). These features become “instances” of the same feature “occurrence”. Feature sharing means that the same index is assigned to all instances of one feature occurrence.

3.1 Volitional Verbs and Cross-clausal Feature Sharing

As already mentioned, cross-linguistically obviation occurs only with a consistent subclass of matrix verbs, so-called volitional verbs. Furthermore, those verbs impose a much stronger dependency on the temporal interpretation of the subordinate clauses than other verb classes which also allow for subjunctive complement clauses. It is only natural to assume that this information is part of the selectional properties of the respective verb class. This can be captured by assuming that the T-feature of the lexical V of volitional verbs is interpreted as containing an open temporal “slot” which has to be filled by the time interval of a complement (= “unrealized time” in the spirit of Tsoulas 1996, Dobrovie-Sorin 2001, Oshima 2003, 2004). In most cases, such an event is expressed by a CP also containing T-features, although those T-features are deficient, cf. below. I follow Pesetsky and Torrego (2006, 2007) in taking T-features of lexical V-s to be valued but uninterpretable. In the case of volitional verbs, this value is incomplete as claimed above.

Besides, the selectional requirements of volitional verbs also include the type of the complement's T-feature: It has to be temporally deficient, i.e., it has to carry non-factual morphology. “Deficient” means that the respective T-feature contains a value which is not independently interpretable (it cannot be located on a temporal axis). Moreover, volitional verbs require the instance which morphologically spells out the deficient feature to be accessible for its incomplete T-feature. This requirement entails that the morphological exponent cannot be “trapped” within the complement domain of the phase head C of the embedded

clause.⁵ As a consequence, volitional verbs can be merged only with CP-complements whose category C contains non-factual morphology, i.e., the volitional matrix verb and the respective marker containing the interpretable defective temporal feature have to be adjacent.

As a consequence of the local syntactic relation between uT_{val} of the matrix verb and the iT_{def} of complement C, the interpretively non-specified time interval of the subjunctive clause is parasitic on the T-feature value of the matrix verb. The syntactic counterpart of this interpretive relation is an AGREE-relation between the T-feature of the matrix verb and the T-feature in C of the complement clause. As proposed earlier, this relation amounts to feature identification of T-features contained within the matrix clause and the complement clause.

Some Slavic languages provide evidence supporting the assumptions made so far, especially concerning the position of the selected interpretable, but deficient T-features within the complement clause. So, the contrast in (12) from Polish shows that volitional verbs only allow for complement clauses introduced by the complementizer *że* ‘that’ marked with the morphological exponent of the deficient T-feature, viz. *-by* (plus possible agreement markers: *-m*, *-ś*, ...).

- (12) a. Adam_i chc-e, że-by *pro**_{i/j} pożycz-y-ł [Po]
 Adam_{m:SG:N} want_{PRS:3:SG} that_{SBJV} *pro* lend_{LPT-m:SG}
 ci książk-ę.
 CL_{2:SG:D} book_{f:SG:A}
 ‘Adam wants him to lend you a book.’
- b. *Adam chc-e, że *pro* pożycz-y-ł-by
 Adam_{m:SG:N} want_{PRS:3:SG} that *pro* lend_{LPT-m:SG-SBJV}
 ci książk-ę.
 CL_{2:SG:D} book_{f:SG:A}

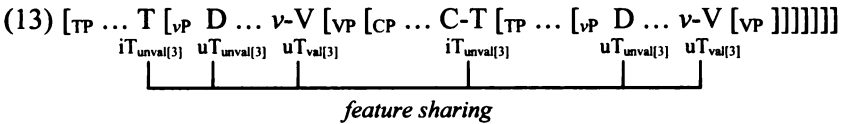
In principle, the non-factual marker *by(-m, -ś, ...)* in Polish subordinate clauses introduced by *że* is not excluded from appearing on the verb or in other positions, cf. (15a) below (cf. also Bondaruk 2004; Tomaszewicz 2007). This option, however, is not available with volitional verbs.

As already stated, in the case of volitional verbs, V's uninterpretable, but valued T-feature already shares its index with the T-feature of the embedded clause (contained in embedded C) due to the abovementioned

⁵ In this paper, I adopt a rather standard notion of the Phase Impenetrability Condition as developed in Chomsky (2000, 2001).

selectional requirements of volitional verbs. In the course of further derivational steps, the T-feature of the volitional verb ultimately establishes an AGREE-relation with matrix T and by transitivity with the T-feature of D of the nominal expression probed by the matrix T: the subject of the matrix clause.⁶

By transitivity, the indices of all instances of the T-feature are co-indexed (indicated by the random subscript 3 in (13)): the matrix T, the matrix subject, the matrix verb, the embedded C-T complex, the embedded subject and the embedded V, cf. (13).



Consequently, the nominative matrix subject as the only DP of the matrix clause and the nominative subject of the subjunctive clause as the only DP of the embedded clause appear to be part of a cross-clausal feature dependency involving identification of feature values (but cf. section 3.3. for an apparent exception). I take this feature dependency to be the relevant local domain for establishing referential relations like binding phenomena (including obviation)—with the proviso that minimality/closeness is observed. If the embedded subject in a structure like (13) is pronominal, co-indexation with the matrix subject is excluded, since both participate in the same cross-clausal feature dependency.

3.2 Non-volitional Verbs and Separate Feature Cycles

In contrast to volitional verbs, non-volitional matrix verbs (e.g. declarative or epistemic verbs) do not select for a specific T-feature value contained within their complement. As has been noted by A&B among others, clausal complements of epistemic verbs do not exhibit the same temporal dependencies as those of volitional verbs. This can be shown by the fact that the embedded clauses are not restricted to certain temporal markings. They may also appear with indicative complement clauses, cf.

⁶ According to Pesetsky and Torrego (2006, 2007), the interpretable but unvalued T-feature of T-categories first shares its T-feature with the subject's D containing an uninterpretable and unvalued T-feature. The T-feature of D is morphologically spelled out as structural case. Feature sharing with finite T canonically yields nominative. Since D does not provide an appropriate value, T probes further in search of a goal containing a value. This value is provided by V's uninterpretable but valued T-feature.

(14) compared to (10).

- (14) a. Lev_i somneva-et-sja, što on_{i/j} sdas-t êkzamen. [Ru]
 Lev_{m:SG:N} doubt_{PRS:3:SG-REFL} that he_N give_{PRS:3:SG} exam_{m:SG:A}
 ‘Lev doubts that he will pass the exam.’
- b. Lev_i somneva-et-sja, što on_{i/j} sda-l êkzamen.
 Lev_{m:SG:N} doubt_{PRS:3:SG-REFL} that he_N give_{PST-m:SG} exam_{m:SG:A}
 ‘Lev doubts that he passed the exam.’

Consequently, lexical information of epistemic verbs does not contain selectional requirements concerning T-features of its complement—only categorial features are selected. Thus, no feature relation between the matrix and the complement clause involving T-features is established. Pronominal subjects of the embedded clause and matrix subjects appear to be in separate feature cycles. Hence, no obviation effects can occur.

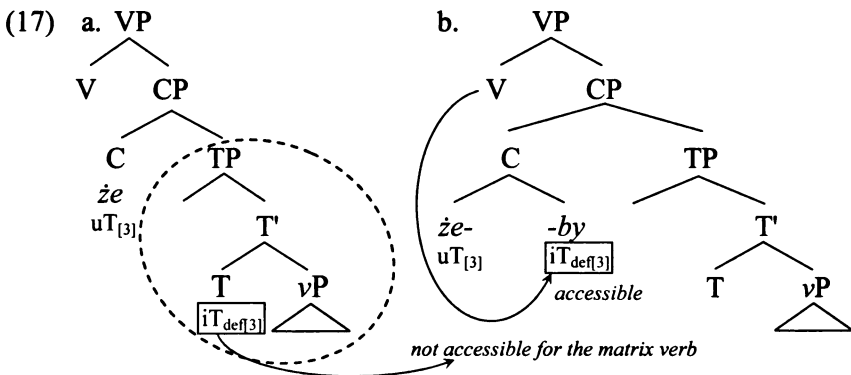
Non-volitional verbs in general (e.g., *verba dicendi*) may rather freely take complements containing non-factual morphology. Interestingly, in Polish, the marker for non-factuality, *by* (plus possible agreement markers), in these cases appears rather on the *l*-participle (or in other positions within the clause) not on the complementizer yielding the mirror image to the contrast in (12), cf. the contrast in (15).

- (15) a. Adam_i mów-i, że *pro*_i pożycz-y-ł-by [Po]
 Adam_{m:SG:N} say_{PRS:3:SG} that *pro* lend_{LPT-m:SG-SBJV}
 ci książk-ę.
 CL_{2:SG:D} book_{f:SG:A}
 ‘Adam says that he would lend you a book.’
 ‘Adam says that he would have lent you a book.’
- b. ?? Adam_i mów-i, że-by *pro*_i pożycz-y-ł
 Adam_{m:SG:N} say_{PRS:3:SG} that_{SBJV} *pro* lend_{LPT-m:SG}
 ci książk-ę.
 CL_{2:SG:D} book_{f:SG:A}

Certain canonically non-volitional verbs seem to have two selectional options: One does not involve T-features, the other does. Crucially, those two options behave differently in all relevant respects, cf. (16).

- (16) a. $Marek_i$ $powiedzia-ł, że pro_i$ $pożyczy-ł-by$ [Po]
 Marek_{m:SG:N} $say_{PST:m:SG}$ that pro $lend_{LPT-m:SG-SBJV}$
 ci $książk-ę$.
 CL_{2:SG:D} $book_{f:SG:A}$
 ‘Marek says that he would lend you a book.’
 ‘Marek says that he would have lent you a book.’
- b. $Marek_i$ $powiedzia-ł, że-by pro_i$ $pożyczy-ł$
 Marek_{m:SG:N} $say_{PST:m:SG}$ that_{SBJV} pro $lend_{LPT-m:SG}$
 ci $książk-ę$.
 CL_{2:SG:D} $book_{f:SG:A}$
 ‘Marek ordered him to lend you this book.’

The sentences behave as expected. In (16a), the non-factual marker is not at the edge of the embedded CP which constitutes a strong phase. It is rather contained within the inaccessible complement domain of C, cf. (17a). The only possible derivation in which a CP as in (17a) can appear is the one in which it is selected by a verb which does not select for non-factual morphology. In (16b), on the other hand, the non-factual marker attaches to the complementizer (= part of the edge of the CP-phase) which makes this particular feature instance accessible for the matrix verb, cf. (17b). Consequently, this type of complement CP is selected by matrix verbs which have to step into a relation with its complement involving a particular type of T-features.



(12), (15) and (16) show that in languages which allows the relevant marker for non-factuality to appear in different positions within clauses introduced by a complementizer these positions correspond to different

types of selectional relations. These facts fit into the present analysis.

3.3 Dative Matrix Subjects

There is one interesting fact concerning obviation that at first sight seems to be an outlier. Some dative DPs in volitional matrix clauses (often considered to be subjects) may not be coindexed with the pronominal subject of the embedded clause, cf. (18).

- (18) Jarkowi_i zachcia-ł-o się, że-by *pro*^{*i/j} go_i^{*j/k} [Po]
 Jarek_{m:SG:D} desire_{LPT-n:SG} REFL that_{SBJV} *pro* CL_{m:SG:A}
 uderzy-ł w twarz.
 hit_{LPT-m:SG} in face_{m:SG:A}
 ‘Jarek wanted him to hit him in the face.’

However, there is good reason to assume that those DPs may enter a relation with their clausemate category T which enables them to provide the relevant feature cycle with their referential feature. Bailyn (2004) observed that certain dative DPs may bind anaphoric elements (for details concerning the relevant data cf. Bailyn 2004). His analysis involves EPP-movement of the DPs in question to the specifier of TP.

Moreover, one can find other binding contexts, where dative DPs in reflexive sentences behave like nominative subjects. In Polish, dative DPs in reflexive impersonal sentences may license otherwise rather strictly subject-oriented anaphoric elements contained within the clausemate accusative internal argument, cf. (19).

- (19) Jank-owi_i czyta-ł-o się swoj-a_i książk-ę [Po]
 Janek_{m:SG:D} read_{LPT-n:SG} REFL REFL:POSS_A book_{f:SG:A}
 z przyjemność-ią.
 with pleasure_{f:SG:I}
 ‘Janek read his own book with pleasure.’

Apparently, there is a difference between items which provide the feature cycle with referential features, cf. (18), and items which are in need of a referential feature, cf. (9). I have to leave this topic for further research.

4 Conclusions

In this paper, I presented an analysis of obviation effects which relies on

cross-clausal feature dependencies and on selectional properties of the volitional matrix verb. With respect to the former, I assume that feature valuation amounts to feature sharing (cf. Pesetsky and Torrego 2006, 2007). Further, I assume that (cross-clausal) occurrences of features may constitute the relevant domains for construal processes. Selectional properties of volitional verbs and the deficiency of the clausal complement's T-feature provide the prerequisite for cross-clausal feature sharing.

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The Distribution of Subjects and Predicates in Bulgarian: An (EPP) V-Feature Account*

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In the past decade or so there has been a lively discussion of the seemingly optional Aux-V or V-Aux order in Bulgarian periphrastic tenses (Rivero 1993, Embick & Izvorski 1994, Caink 1998, Lambova 2004). The proposed analyses include a Long Head Movement analysis (Rivero 1993), PF insertion accounts (Embick & Izvorski 1994, Caink 1998), and scattered deletion of parts of two copies of the same complex Aux-V head (Lambova 2004). However, the relative order of predicates and subjects has received comparatively little attention. The most notable exception is an attempt to explain the ungrammaticality of a sentence-initial subject with V-Aux order in Lambova (2004). To our knowledge, there have only been partial attempts to account for the subject-predicate order in all three types of sentences—declaratives, yes-no questions and *wh*-questions.

This paper shows that the order of subjects, verbs and auxiliaries in Bulgarian can be accounted for by positing an EPP V-feature in T (rather than a D-feature). This account eliminates unnecessary movement of the subject to Spec,TP. In addition, we provide new data that shows that the mechanism of “scattered deletion” (Franks 1998, Bošković 2001, Lambova 2004) cannot account on its own for the full array of empirical evidence. We extend the scattered deletion approach in order to explain constraints on the relative distribution of Aux and V, their interaction with the placement of the subject, and the availability of focus interpretations to constituents that do not move into Lambova’s ΔP (i.e. FocusP).

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1 Empirical issues

1.1 *Optional V-Aux*

The seemingly optional Aux-V or V-Aux order in Bulgarian (1a-b) has long been noted in the literature on Romance and South Slavic languages (Lema and Rivero 1989, Cavar and Wilder 1994, Bošković 1995).¹

- (1) a. Bjaxa pročeli statijata. Aux-V-O
 were read article
 ‘They had read the article.’
- b. Pročeli bjaxa statijata, ne pregledali. V-Aux-O
 read were article not skimmed.through
 ‘They had read the article, and not skimmed through it.’

Since Bulgarian is a pro-drop language, the data in (1) masks the fact that only (1a) but not (1b) allows for the subject to surface in sentence-initial position (see 2a,b below). Note that (2a) is grammatical with the subject receiving either a topic or a focus reading. (2b), with V-Aux order, is ungrammatical, regardless of how the subject is interpreted.

- (2) a. Studentite/studentite bjaxa pročeli statijata.
 students were read article
 ‘The students_{TOP}/STUDENTS_{FOC} had read the article.’
- b. *Studentite pročeli bjaxa statijata
 students read were article

1.2 *Lambova’s 2004 account*

To account for the data in (1) and (2), Lambova (2004) proposes that CP immediately dominates a Δ P which licenses both [topic] and [focus]. She argues further that Bulgarian (multiple) *wh*-movement is actually a focus fronting operation to Spec, Δ P, followed by *wh*-movement to Spec, CP of the left-most *wh*-word. Note first in (3) and (4) that a *wh*-element displays the same distribution as a focused element. First, like the *wh*-word *kakvo* in (3), the focused direct object DP *kljuka* in (4) is in sentence-initial position. Second, focus movement involves subject-verb inversion just like *wh*-fronting (in both examples the Aux-V complex

¹ A reviewer of this paper notes that the analog of (1a) in Czech would be ungrammatical, on account of the “clitic status of the auxiliary” and the restriction of clitics to second position. This restriction also applies in Bulgarian, the difference being that only present tense auxiliaries have the status of clitics (cf. Lambova 2004). For instance, if *bjaxa* in (1a) were replaced by *sa* ‘are’, the sentence would be ungrammatical. Why past tense auxiliaries do not have clitic status in Bulgarian remains an open question, and one worth pursuing.

precedes the sentential subject *Ivan*).²

- (3) **Kakvo** e kazal Ivan na Maria?
 what is said Ivan to Maria
 ‘WHAT did Ivan say to Maria?’
- (4) **Kljuka** e kazal Ivan na Maria, (ne istina)
 gossip is said Ivan to Maria (not truth)
 ‘Ivan has told Maria a GOSSIP not the truth.’

While it is certainly plausible, from (3) and (4), that *kakvo* and *kljuka* move to distinct positions (e.g. CP and ΔP, respectively), it is Lambova’s contention that *kakvo* moves **through** the Spec, ΔP occupied by *kljuka* in (4). As evidence for this, she notes that a *wh*-cluster can be split in Bulgarian after the first *wh*-word as. In (5), the leftmost *wh*-element is claimed to occupy Spec,CP while the remaining *wh*-elements are left behind in Spec,ΔP.

- (5) Koj, spored teb, kakvo na kogo e kazal?
 Who according.to you what to whom is said
 ‘Who, according to you, said what to whom?’

Further support for this position is found in Tasseva-Kurktchieva (2001). Example (6) illustrates the fact that the head of CP can precede the *wh*-elements, suggesting that they occupy a position subordinate to CP.

- (6) Vjarvaš, če koj kakvo e kazal?
 you.believe that who what is said
 ‘You believe that who said what?’

The position taken by Lambova is that *wh*- and focus movement are, at least initially, the same fronting operation resulting in focused and *wh*-

² Note that it is possible for both the focused/*wh*-element and the subject to appear before the verb, as in (i).

- (i) Kakvo/kljuka Ivan e kazal na Maria(?)
 what/gossip Ivan is said Ivan to Maria
 ‘What did Ivan say to Maria?’/‘Ivan has told Maria a gossip.’

This would appear to indicate that subject-verb inversion in (3-4) is not obligatory. However, when the subject precedes the verb in this fashion, the subject itself has a focus reading. Thus, in (i), both the focused/*wh*-element and the subject have moved out of TP and the verb has in fact undergone inversion.

elements moving to the Spec, Δ P. Lambova's proposed structure of the left periphery of Bulgarian *wh*-questions is shown in (7). Here, CP contains only the first *wh*-word and subsequent *wh*-words are licensed in an immediately subordinate Δ P where they bear either topic or focus interpretation³.

- (7) [CP *wh*₁ [Δ P *wh*₂ *wh*₃ Δ [TP T [ν P ...]]]

Lambova also includes the Δ P projection in her analysis of the Aux-V/V-Aux alternation. A crucial aspect of her account is the assumption that the participial verb *pročeli* 'read' in (8) always right-adjoins to the auxiliary *bjaxa* 'were', forming a complex ν head. On this assumption, her analysis of (1a/2a), both with an Aux-V-O order, is straightforward. The newly formed complex head in ν is further moved to T⁰. Where the subject is overt, as in (2a), this move is followed by a movement of the subject to Spec,TP. Only the left-most of all generated copies can survive at PF thus giving us the expected S-Aux-V linearization.

- (8) [Δ P *studentite* [Δ *bjaxa+pročeli* [TP *studentite*
[T' *bjaxa+pročeli* [ν P *studentite* [ν ' *bjaxa+pročeli*
[ν P *pročeli statijata*]]]]]]

To account for the problematic data in (1b) and (2b) with a V-Aux-O order, Lambova proposes a scattered deletion approach modeled after Franks' (1998) "pronounce a copy" hypothesis. To this, Lambova adds a stipulation: Scattered deletion is only possible when the two copies of the same complex are immediately adjacent. Therefore, the sentential subject must be obligatorily null in the V-Aux linearization. Since the participial *pročeli* 'read' is generated with a [+focus] feature which needs to be checked, the whole complex head moves from head of ν P (where it is derived) to T⁰ and then to Δ ⁰ for feature-checking. The motivation for scattered deletion, according to Lambova, is phonological. The string *pročeli bjaxa* (involving the participial *pročeli* in the upper copy of Aux-V and the Aux *bjaxa* in the lower copy) form a phonological word. Pronouncing the upper copy of the Aux-V complex would result in a PF violation and scattered deletion is triggered to avoid this. Since the subject position is not filled overtly (shown with outline font in example (9)), it does not break up the prosodic constituent V_{UPPER}-Aux_{LOWER}. This leaves the two copies in Δ ⁰ and T⁰ adjacent at PF and licenses scattered deletion in (9).

³ Lambova indicates that Δ P is also the target of topic movement in Bulgarian. Since topics are irrelevant to the current discussion we will direct the reader to Lambova (2004) for extended discussion of this proposal.

- (9) [_{AP} [_Δ **bjaxa+pročeli** [_{TP} *studentite* [_T **bjaxa+pročeli** [_{VP} *studentite* [_V **bjaxa+pročeli** [_{VP} **pročeli** *statijata*]]]]]]]]

A prediction of this analysis is that “if the subject cannot be pronounced in SpecTP, it should be possible for its lower copy to be activated outside of the prosodic constituent of the verb. Presumably, that will be below TP, i.e. in the VP internal position” (Lambova 2004: 148) as in (9) above.

Note that Lambova’s account operates on the assumption that the subject (albeit a phonologically null copy) must obligatorily move to Spec,TP. This necessitates an explanation of (i) why only the lower copy is pronounced and (ii) why the upper copy does not break up a phonological word. In our account, here below, we will show that there is no movement of the subject to Spec,TP in cases such as (9).

1.3 *The problematic data*

Lambova’s account relies crucially on two facts: (i) the formation of a complex verbal Aux-V head and (ii) the stipulation that in the marked V-Aux order the sentential subject position is phonologically null. We first turn to a discussion to the complex Aux-V head (saving our discussion of the latter for section 2). Since Aux and V form a complex head, nothing should be able to intervene between the two verbal elements. There are, however, cases in which the Aux and the V can indeed be split. (10a,b) show that an adverb can intervene between Aux and V, provided that either the Aux or the adverb are focused. Although highly marked, these structures are not ruled out. Note however that (10c) is ill-formed in any context, V-Adv-Aux order being uniformly ungrammatical. (10d) shows the normal order of these elements with a focused Aux or Adv and with no special context.

- (10) a. ?A-xa, **bjaxa** često čeli statii studentite, njama što.
uh-huh were often read articles students there.is.no PART
‘Sure, the students HAD often read the articles, I believe that.’
- b. Da be, **bjaxa često** čeli statii studentite.
yes PART were often read articles students
‘Sure, I believe that the students had OFTEN read the articles.’
- c. *A-xa /Da be, čeli često **bjaxa** statii studentite
uh-huh/yes PART read often were article students
- d. **Često** **bjaxa**/često **bjaxa** čeli statii...
often were/often were read articles...
‘They had OFTEN read articles.’/
‘They HAD often read articles.’

The same situation obtains when a subject intervenes between Aux

and V. A subject can split Aux and V in their canonical order (11a,b), although only in highly marked contexts, but it cannot ever split V and Aux, as shown in (11c).

- (11) a. A-xa, **bjaxa** studentite pročeli statijata, njama što.
 Uh-huh were students read article there.is.no PART
 ‘Sure, the students HAD read the article, I believe that.’
 b. Da be, **bjaxa studentite** pročeli statijata, ne profesorite.
 yes PART were students read article not professors
 ‘Sure, I believe that the STUDENTS had read the article, not the professors.’
 c. *Pročeli studentite **bjaxa** statijata
 read students.the were article.the

Leaving aside the problematic fact for Lambova’s account that the pronominal clitics mandatorily split the Aux-V complex (Franks 2007), her account also cannot explain the focus shift in (10a-b) and (11a-b). Section 2 presents our revision of her analysis of the linearization of Aux and V in Bulgarian.

2 Analysis of declaratives and wh-questions

In revising and extending Lambova’s account, we propose that: (i) Aux and V do not form a complex head when Aux precedes V, (ii) Bulgarian is one of a group of languages (typified by V-initial languages, but including Slavic languages) that require movement of a V-element to check an EPP V-feature (rather than a D-feature) in T (Massam 1991 and 2001, Alexiadou & Anagnostopoulou 1998, McCloskey 2001, Davies & Dubinsky 2001).

2.1 EPP V-feature in T

As proposed in Davies & Dubinsky 2001, languages may be either V-prominent or D-prominent. D-prominence correlates with the presence of a D-feature on T, and V-prominence with a V-feature on T. On this view, the EPP involves checking a D-feature in TP in D-prominent languages (e.g. English and French) and a V-feature in TP in V-prominent languages (e.g. Bulgarian, Niuean, and Irish). The division of languages into D-prominent and V-prominent categories is supported by work on various V-initial languages (Chung 1982 on Chamorro, Massam 1991 and 2001 on Niuean, and McCloskey 2001 on Irish), as well as by contrastive studies of D- and V- prominent languages in Dubinsky &

Davies (2001) and Alexiadou & Anagnostopoulou (1998) on Celtic, Greek, and Romance.⁴

Evidence supporting this view includes the fact that V-prominent languages do not exhibit subject islandhood. This is seen both in V-initial languages such as Chamorro and in Slavic languages. (12) provides an illustration from Chamorro (Chung 1982) in which extraction is seen to be possible out of a subject. In (12), *hafa* ‘what’ has been extracted from the CP subject *ni maloago'-a i lhi-mu* ‘that your son wants x’. Similarly, Bulgarian allows *wh*-extraction out of the infinitival subject of a subordinate clause as in (13), as long as the clause is not headed by a noun.⁵

(12) *hafa*₁ *um-istoba hao* [*ni maloago'-a i lhi-mu t*₁]?
 what um-disturb you comp want+nmlz-his the son-your
 ‘What does that your son wants disturb you?’

(13) *Na kakvo*₁ *misliš* [*če* [*da otide t*₁] *beše važno*
 to what you.think that to go was important
za nego].
 for him
 ‘To what do you think that to go was important for him?’

Another fact that speaks in favor of our proposal that Bulgarian is a V-prominent language is shown in (14). While conjoined NP subjects in Bulgarian trigger obligatory plural agreement (14a), conjoined non-NP subjects cannot trigger plural agreement on the verb (14b). This contrasts with a D-prominent language such as English where a non-NP subject may trigger singular or plural agreement (14c/d) on account of two ways in which an AP subject can have a DP-shell.

⁴ A reviewer of this paper suggests that Breton, which exhibits both VSO and SVO “neutral wide-focus” order, might variously be V-prominent and D-prominent. A fuller investigation of this possibility is obviously outside the scope of this paper.

⁵ The extraction of *na kakvo* out of *da otide* in (13) is possible, not because the infinitival VP is not in Spec,TP (as suggested by a reviewer of this paper), but rather because the subject is not itself a DP. In Davies & Dubinsky 2001, it is shown that English non-nominal arguments are contained in a DP-shell when in subject position (i.e. Spec,TP), but not when in other positions. This leads to island (i.e. subjacency) effects for non-nominal subjects but not for non-nominal objects. V-prominent languages do not impose a DP requirement on subject position and, accordingly, non-nominal subjects may in fact occupy Spec,TP without becoming subject islands.

- (14) a. Ivan i Lili bjaxa nevnimatelni / *beše
 Ivan and Lily were inattentive_{PL} was
 nevnimatelen / *beše nevnimatelna.
 inattentive_{MASC_{SG}} / *was inattentive_{FEM_{SG}}
 ‘Ivan and Lily were inattentive.’
- b. [_{IP} da zakâsnjavaš za zasedanija] i [_{IP} da zabravjaš
 to be.late for meetings and to forget
 knjige] beše neprostimo / *bjaxa neprostimi.
 the.books was unexcusable_{SG} were inexcusable_{PL}
 ‘To be late for meetings and to forget the books was/were
 inexcusable.’
- c. [_{DP} [_{AP} [_{AP} attentive] and [_{AP} handsome]]] is how Julia likes her
 dates.
- d. [_{DP} [_{DP} [_{AP} attentive]] and [_{DP} [_{AP} handsome]]] are not mutually
 exclusive characteristic(s)⁶.

Finally, V-initial sentences in Bulgarian do not show definiteness effects (15a). In contrast, D-prominent languages show such effects (15b).

- (15) a. Dojdoxa studentite/njakolko studenti/vsički studenti.
 came students.the/several students/all students
 ‘The/several/all students came.’
- b. There arrived some students/*the students/*all students

With the TP in Bulgarian having an EPP V-feature, rather than a D-feature, movement of the subject NP to TP is unmotivated. Only verbal constituents can check off this [+V] feature. We take this further and suggest, in accordance with principles of economy, that the V-prominence of Bulgarian renders the projection of Spec,TP unnecessary (since EPP is normally checked by V via head movement). When a specifier of TP is inserted, it is for purposes other than feature checking.

2.2 *Lambova 2004 revised*

We further revise Lambova’s analysis of the periphrastic tenses in Bulgarian, maintaining her proposals of a discourse-oriented projection Δ P between TP and CP and of scattered deletion applying to portions of two copies of the same constituent. We propose however that V right-adjoins to Aux in a complex head only when there is motivation for it to do so.

When V has [+focus], it must check this feature in Δ P. However, being separated from Δ P by the projection of Aux, it must either move

⁶ We thank an anonymous reviewer for providing a better example for (14d).

through Aux (adjoining to it along the way), or else move to Δ^0 without stopping at Aux. In the latter case, movement would violate the Head Movement Constraint (HMC) of Travis 1984. A [+focus] Aux, on the other hand, can move freely to Δ^0 without violating the HMC. There thus is no need for a complex head to be formed when Aux alone is moved.

When V is generated without [+focus], it remains in situ, adjunction to Aux being unnecessary and unmotivated. The discourse-neutral example with Aux-V-O order in (1a) is derived by movement of Aux to T^0 for EPP feature checking, as shown in (16). In case Aux is enumerated with a [+focus] feature, it also moves from T^0 to Δ^0 .

- (16) [_{TP} bjaxa₁ [_{VP} t₁ [_{VP} pročeli] statijata]]]
 were read article

The only difference between (1a) and (2a) is the appearance of the subject *studentite* in sentence-initial position. On our account, (2a) is derived in a manner similar to (1a/16) by movement of Aux to T for EPP and movement of the focused or topicalized subject to Spec, Δ P (shown in 17).⁷

- (17) [_{ΔP} studentite₁ Δ [_{TP} bjaxa₂ [_{VP} t₁ t₂ [_{VP} pročeli ...]]]]
 students were read [article]

In contrast with this, the V-Aux-O order in (1b) (shown in (18)) is a result of the enumeration of the participial verb *pročeli* with a [+focus] feature. This triggers its right adjunction to Aux in head of ν P. The complex Aux-V head moves to T for EPP and then to Δ for focus, followed by scattered deletion triggered by the prosodic requirement that a focused V is part of a larger phonological constituent (Lambova 2004, following Franks 1998 and Bošković 2001).

- (18) a. [_{ΔP} Δ [_{TP} T_[+V] [_{VP} [[bjaxa] pročeli₁] [_{VP} t₁ ...]]]]
 b. [_{ΔP} [_Δ bjaxa-pročeli₂] [_{TP} [_T bjaxa-pročeli₂] [_{VP} t₂ ...]]]]

The ungrammatical (2b) (given in (19)) with an overt subject preceding the V-Aux order can only be derived like (1b/18) with the additional movement of the subject to Spec, Δ P. But here, the V-Aux complex in Δ and the subject in Spec, Δ P compete to check [+focus] in Δ . (2b/19) is thus ill-formed as a consequence of one head checking two

⁷ This derivation assumes, following Lambova 2004, that both Topic and Focus are checked in Spec, Δ P.

elements.⁸

- (19) *_{[Δ P studentite₁ [Δ ~~bjaxa-pročeli~~₂] [T_P [T ~~bjaxa-pročeli~~₂] [$_{VP}$ t₁ t₂ [$_{VP}$ pročeli ...]]]]}

Returning to (10-11) with the canonical Aux-V order, recall that they are problematic for Lambova’s analysis in that Aux and V can be split by adverbs or subjects and clearly must not form a complex head in these instances. Our revision to Lambova’s analysis makes the correct predictions for (10a) and (11a) with an adverb and a subject, respectively, intervening between Aux and V. The examples are repeated in (20a,b) respectively. Here, Aux moves alone through T to Δ for [+focus].

- (20) a. [Δ P *bjaxa*₂ [T_P često [T_P t₂ [$_{VP}$ t₂ [$_{VP}$ čeli ...]]]]
 b. [Δ P *bjaxa*₂ [T_P t₂ [$_{VP}$ studentite t₂ [$_{VP}$ čeli ...]]]]
 were often students read

(10b) and (11b) have the same word order as the (a) examples, but have focus on the second element. These too are problematic for the original account in Lambova (2004), not only because there is an intervening element between the two verbs but also because this intervening element bears [+focus]. We propose that (10b) and (11b), represented here as (21a) and (21b) respectively, involve the familiar autonomous movement of Aux through T to Δ , except that the Aux- Δ head in this instance “exceptionally” checks the focus feature of the intervening element adjoined to TP and subjacent to Δ .

- (21) a. [Δ P *bjaxa*₂ [T_P često [T_P t₂ [$_{VP}$ t₂ [$_{VP}$ čeli ...]]]]
 b. [Δ P *bjaxa*₂ [T_P studentite₁ [T_P t₂ [$_{VP}$ t₁ t₂ [$_{VP}$ pročeli ...]]]]

In (21), *bjaxa* does not have a [+focus] feature and cannot check Δ . However, the element occupying Spec,TP (its complement) does have [+focus] and is visible to Δ (being dominated by only one segment of TP). In this configuration, *bjaxa*- Δ checks the focus feature of its complement in the same manner as a verb exceptionally checks the accusative case of a complement subject in an ECM construction.⁹

⁸ Under Lambova’s 2004 analysis, (2b/19) should be allowed, since nothing separates the two copies of the complex head other than the trace of the subject (in Spec,TP), which is phonologically null and cannot block scattered deletion (see discussion surrounding example (9)).

⁹ We assume here that the movement of *bjaxa* to Δ is motivated by the need for the checking element to be overt in this case.

We thus claim that the formation of an Aux-V complex head (as proposed by Lambova) only applies in the discourse-marked V-Aux order, and that this is specifically motivated by the need for the participial to check its [+focus] feature in Δ . We also retain her adjacency restriction on scattered deletion, namely that it is only possible when the two heads are immediately adjacent. The ungrammaticality of (10c) and (11c) with an adverb and subject, respectively, intervening between V and Aux follows. The structure of these examples is shown in (22a,b), where adjunction of an adverb or a subject to TP blocks scattered deletion as predicted.

- (22) a. * $[_{\Delta P}$ ~~bjaxa-pročeli~~ $_2$ $[_{TP}$ često $[_{TP}$ ~~bjaxa-pročeli~~ $_2$ $[_{VP}$ t₂ ...]]]
 b. * $[_{\Delta P}$ ~~bjaxa-pročeli~~ $_2$ $[_{TP}$ studentite₁ $[_{TP}$ ~~bjaxa-pročeli~~ $_2$ $[_{VP}$ t₁ t₂ ...]]]

2.3 The declarative pattern in (multiple) *wh*-questions

The patterns of subject and adverb placement we have seen in declaratives, and which are problematic for Lambova's account, hold for interrogatives as well. The *wh*-questions in (23a,b) below show once again that a subject or adverb can split verbal heads in the canonical order (Aux-V), and that either of them can take a [+focus] reading. We thus propose the same derivation for (23a) and (23b) as for the examples with Aux-S-V or Aux-Adv-V order discussed above. Since (23) involves *wh*-questions, additional movement of a *wh*-element to CP is motivated. (23c) is ungrammatical for the same reason as the V-Aux examples with an intervening subject or adverb above (i.e. because the adjunction of the subject *Ivan* to TP blocks scattered deletion).¹⁰

- (23) a. Kakvo **beše** Ivan/skoro pročel? (from Franks 2008)
 what was Ivan/recently read
 'What HAS Ivan read?' / 'What HAS he recently read?'
 $[_{CP}$ kakvo₁ $[_{\Delta P}$ beše₂ $[_{TP}$ t₂ $[_{VP}$ Ivan/skoro t₂ $[_{VP}$ pročel t₁]]]

¹⁰ A reviewer suggests that (23c) and (24c) are bad even without an intervening subject between V and Aux. However, this turns out not to be true. When the participles *pročel* or *kazal* in (i) and (ii) carry focus intonation, they can precede the Aux *beše* as long as nothing intervenes.

- (i) Kakvo **pročel** beše? Če toj ne čete.
 what read was PART he not read
 'What had he read? But he doesn't read, (ever)!'

(ii) Kakvo na kogo **kazal** beše? Mi toj s nikoj ne govori.
 what to whom said was PART he with nobody not talks
 'What had he said to whom? But he doesn't talk with anybody!'

- b. **Kakvo beše Ivan/skoro pročeł?**
 what was Ivan/recently read
 ‘What has IVAN read?’ / ‘What has he RECENTLY read?’
 [CP kakvo₁ [ΔP beše₂ [TP Ivan₃/skoro [TP t₂ [VP t₃ t₂ [VP pročeł t₁]]]]]
- c. ***Kakvo pročeł Ivan beše**
 what read Ivan was
 *[CP kakvo₁ [ΔP beše-pročeł₂ [TP Ivan₃ [TP beše-pročeł₂ [VP t₃ t₂ t₁]]]]

The same pattern is observed in multiple *wh*-questions (24), which are derived in the same manner as the single *wh*-questions in (23), except for the fact that the second *wh*-element occupies Spec,ΔP (as suggested in Lambova 2004).¹¹

- (24) a. ?**Kakvo na kogo beše Ivan kazal?**
 what to whom was Ivan said
 ‘What DID Ivan say to whom?’
- b. **Kakvo na kogo beše Ivan kazal?**
 what to whom was Ivan said
 ‘What did IVAN say to whom?’
- c. ***Kakvo na kogo kazal Ivan beše?**
 what to whom said Ivan was

3 Still more puzzles from *yes-no* questions

Not surprisingly, the Aux-V and V-Aux orders show the same distribution in *yes-no* questions as in declaratives and *wh*-questions, except that the question particle *li*, unlike subjects or adverbs, can indeed split V-Aux as in (25). We suggest that (25) is generated in much the same way as the declarative V-Aux sentence, except that the verb *pročełi* is inserted into the derivation with the question/focus particle *-li* attached (following Bošković 2001 and Lambova 2004).¹² *Pročełi-li* first adjoins

¹¹ See Lambova (2004) for arguments that ΔP can simultaneously check both [topic] and [focus]. Note that (24a), while not ungrammatical with focus on the Aux *beše*, is simply anomalous, there being few contexts in which a multiple *wh*-question would require focus of the auxiliary verb.

¹² A reviewer of this paper suggests that *li* could not be “attached” at insertion in cases which have “multi-word focus phrases” such as in (i).

- (i) **Ne sŭm li mu go dala?**
 not am LI him it give
 ‘AM I not giving it to him?’

to *bjaxa* to form the complex head *bjaxa-pročeli-li* as in (25(i)). This then moves through T and Δ to C to check its question feature as in (25(ii)). Scattered deletion operates across the adjacent heads C and Δ .¹³

- (25) **Pročeli li** *bjaxa statijata studentite?*
 read LI were article students
 ‘Had the students READ the article?’
 (i) ... [_{VP} [[*bjaxa*] *pročeli-li*₁] [_{VP} *t*₁ ...]]]
 (ii) [_{CP} ~~*bjaxa-pročeli-li*~~₂ [_{AP} ~~*bjaxa-pročeli-li*~~₂ [_{TP} ~~*bjaxa-pročeli-li*~~₂ [_{VP} *t*₂ ...]]]]]

Now, compare the marked V-Aux order in the grammatical (25) with *li* intervening between the two verbal elements and the ungrammatical (26). There we can see that, with or without *li*, the subject is still illicit between V and Aux. Assuming Lambova’s analysis of *li* as a clitic enumerated on its host, we predict (26) to be ill-formed in the same way that any other V-Aux sentence with an intervening element between the two verbs is. The presence of the subject *studentite* between the two copies of *bjaxa-pročeli-li* precludes the operation of scattered deletion.

- (26) ***Pročeli li** *studentite bjaxa statijata*
 read li students were article
 * [_{CP} [_C ~~*bjaxa-pročeli-li*~~₂] [_{AP} *studentite*₁] [_Δ ~~*bjaxa-pročeli-li*~~₂] [_{TP} *t*₁ *t*₂ ...]]]

4 Conclusion

In the account presented here, we have seen that word order in certain declaratives and questions can be accounted for by positing movement of verbal elements to T, claiming that this movement is motivated by the required checking of an EPP V-feature in T. The interaction of this V-flavored EPP requirement, in conjunction with a revised version of the scattered deletion account of the optional Aux-V/V-Aux orders in

We would suggest that *ne sūm li mu go* is not a “multi-word focus phrase”, or indeed that if it is, it is derived through insertion of its parts. In any event, we note that it is *sūm* and no other part of this “phrase” which is focused and that under our account, *sūm* is simply inserted into the derivation with its focus feature spelled out as *li*.

¹³ Another piece of the puzzle here is the appearance of the subject in sentence-final position. As Izvorski (1995) notes, this position of the subject in yes-no questions is preferred but still optional (c.f. *Pročeli li bjaxa studentite statijata?* where the subject *studentite* precedes the object *statijata*). Izvorski claims that this is due to an optional rule of subject postposing, much in line with Kayne & Pollock’s (1978) Stylistic Inversion (which in French is obligatory).

Bulgarian (Lambova 2004), is seen to account for the full range of available orderings of subjects, auxiliaries, and verbs in a range of clause types, including declaratives, yes-no interrogatives, and *wh* questions. In our view, the formation of a complex verbal head (such as Lambova proposes) only occurs when the participial verb has a [+focus] feature. We see right adjunction and incorporation of the V to the Aux as the only way the [+focus] feature can be checked in an appropriate configuration in Δ P without violating the HMC. Our account is not only successful in explaining the data at hand, but does so without positing unneeded and otherwise unmotivated functional categories. We also see the success of this analysis as further support for a view of clause structure in which clausal well-formedness conditions such as the EPP are seen to vary parametrically across languages.

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The Prosody of Second Position Clitics and Focus in Zagreb Croatian*

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It is well known that in Serbo-Croatian (SC), second position (2P) clitic placement can alternate between after the first syntactic constituent (1C) and after the first phonological word (1W). This alternation has become a textbook example for the interaction between syntax and phonology and an impetus for proposals challenging standard accounts of the syntax-prosody interface.

This paper draws attention to the details of the alternation in 2P clitic placement itself. It is about the interaction of prosody, focus, and alternation in second position clitic placement in Zagreb Croatian; it is the first systematic instrumental study on the prosody of 2P clitics in SC and the first study of 2P clitics in SC to emphasize the role of pragmatics in clitic placement.

We suggest that the 1W clitic placement may inherently be associated with focus, according to native speaker intuitions and based on differences in tonal alignment in the prosodic realization of the two different clitic placements. In addition, contrary to the predictions of Radanović-Kocić (1988, 1996), we find no evidence for a prosodic break right-aligned to the edge of a sentence-initial narrowly focused element, before a 1W clitic string. The absence of such a break implies that, under an edge-aligned syntax-prosody mapping, prosodic phrasing cannot

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provide direct evidence for split construction accounts of 2P clitic placement after the first phonological word.

1 Introduction and background

1.1 Distribution of second position clitics in Bosnian/Croatian/Serbian

While SC is a free word language, the distribution of SC enclitics is very restricted: they must come in the ‘second position’ of the sentence, as in (1), and are thus called 2P clitics. Moreover, multiple 2P clitics within a clause must be string-adjacent and traditionally occur in a specific order, shown in (2): first comes the question particle *li*, followed by all auxiliary clitics except *je*, then the pronominals, the reflexive clitic *se*, and finally *je* (Franks and King 2000).

- (1) Ivan *je* pio pivo.
Ivan is drink beer
‘Ivan drank beer.’

- (2) *li* < AUX except *je* < DAT < ACC < GEN < *se* (REFL) < *je*

While 2P clitics occur in several Slavic languages, as well as in other languages such as Sanskrit, Pashto, Tagalog, and Warlpiri (Bošković 2001, Halpern 1995), SC is one of the few languages and only modern Slavic language that allows two, quite freely alternating placements for 2P clitics in subject-initial sentences, as shown in (3) (Browne 1974). In (3a), the 2P clitic comes after the entire DP. However, in (3b), it comes after the determiner.

- (3)
- a. after the first constituent (1C)
[Taj čovjek]_{DP} *je* pio pivo.
That man is drink beer
‘That man drank beer.’
 - b. after the first (phonological) word (1W)
Taj *je* čovjek pio pivo.

The optionality between the two placements, either after the first constituent (1C), as in (3a) or after the first phonological word (1W) as in

(3b), has inspired many accounts reconciling both syntactic and phonological factors in 2P clitic placement. On the one hand, data showing that 2P clitics cannot always be placed after the first phonological word indicate that phonology alone cannot determine 2P clitic placement (Halpern 1995, Progovac 2005). On the other hand, evidence that 2P clitic placement is sensitive to prosodic breaks indicate that syntax alone cannot provide a full account of how the clitic placement is conditioned (Radanović-Kocić 1988, 1996, Zec and Inkelas 1990).

In the existing work on the interaction of prosodic phonology and 2P clitic placement, there are no published instrumental studies on the prosody of 2P clitics. Also, alongside the syntactic and prosodic work on 2P clitics, there has been very little attention to the interaction of pragmatics with 2P clitic placement in the literature. This study is an initial step towards filling these gaps and explores the interaction of alternation in 2P clitic placement, focus pragmatics, and prosody. The prosodic analysis is based in the autosegmental-metrical framework of intonation (Ladd 1996, i.a.).

1.2 Focus and second position clitic placement in SC

In the literature and according to some of our consultants, the 1W placement is more marked than the 1C placement—it is more formal, literary, and old-fashioned (Browne 1974, Halpern 1995). Furthermore, anecdotal evidence from SC linguists and our consultants suggests an interaction between focus and clitic placement: for most, 1W placement is particularly (and for some, only) natural if the word preceding the clitic string is narrowly rather than broadly focused¹; some also report that 1W placement is most natural if either the word preceding or following the clitic string is narrowly focused. Thus, our first and most general hypothesis for our speakers was (4):

(4) *Hypothesis 1: 1W placement is inherently associated with focus.*

¹ We define the broad focus reading of a sentence as the reading where the sentence contains all new information and the narrow focus reading as the reading where an element in the sentence requires corrective or contrastive focus. See (14) and (15).

1.2.1 Focus prosody and second position clitic placement in SC

Because of the hypothesis in (4) and since literature on SC prosody has found that SC can mark focus prosodically (Godjevac 2000, 2005, Smiljanić 2004), we also proposed the following general hypothesis regarding prosody in (5):

(5) *Hypothesis 2: 1W placement and 1C placement have different prosodic realizations.*

Smiljanić (2004) conducted a production study with disyllabic target word nouns followed by the clitic *je* in sentences which had the structure [N]_{DP} *je* V {Obj, Adj} as in (6) below and in the schematic representation in Figure 1. The sentences were elicited in broad focus and with narrow focus on the subject DP.

- (6) [Mama]_{DP} *je jela bananu.*
 Mama is eat banana
 'Mama ate a/the banana.'

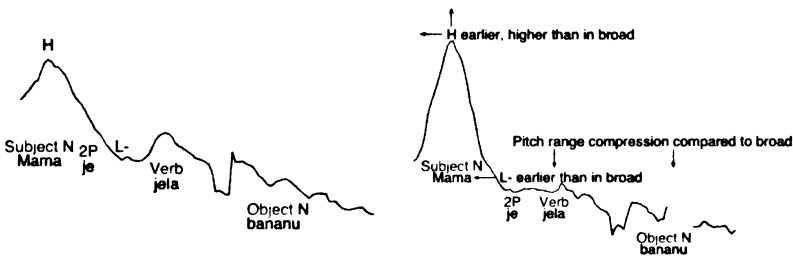


Figure 1. Schematic representations of (6) under broad focus (left) and under narrow focus on the subject noun (right). Key markers of narrow focus include retraction and higher peak height of the pitch peak (marked H) in the focused element and retraction of the low target (marked L-) and post-focal deaccenting/pitch range compression following the focused element.

In Smiljanić (2004), focus on the subject noun was realized by: lengthening of the stressed vowel in the noun, retraction of the low tonal target before the peak H preceding the noun, retraction and raising of the pitch peak in the noun, and a lowered and retracted low tonal target L- following the noun.

Since languages can show a tradeoff between prosodic and syntactic marking of narrow focus, i.e. a tradeoff between cues from tonal alignment and word order (Face and D'Imperio 2005), with the assumptions that 1W placement signals focus by split subject DP word order and that 1W placement is inherently associated with focus, (4), we hypothesized more specifically from (5) the following in (7).

(7) *Hypothesis 2: 1W placement and 1C placement have different prosodic realizations.*

Hypothesis 2a: There is less or no prosodic marking of narrow focus on the first word for 1W compared to 1C placement.

Hypothesis 2b: There is prosodic focal marking present in broad focus for 1W compared to 1C placement.

1.2.2 Syntactic/prosodic break before 2P clitic string for 1W constructions?

Particularly of interest for our studies was that in Smiljanić (2004), the low tone immediately following the pitch peak in the noun, L-, was retracted from after the clitic to before the clitic in narrow focus on the subject noun, as shown in Figure 1 and in (8). Godjevac (2000, 2005)'s findings agreed with this L- placement in narrow focus, and she proposes a zero phrase accent Ø- at the right edge of the focused element inducing post-focal pitch range compression.

(8) Retraction of L- in narrow focus on subject noun in Smiljanić (2004)

Broad focus : N *je* L- V Obj

Narrow focus: [N]_{FOC} L- *je* V Obj

Thus, we hypothesized the tonal retraction in (9) for 1W placement with DP subject-initial sentences:

(9) *Hypothesis 3: The L target following the adjective is retracted as follows for 1W placement:*

Broad focus : Adj 2P clitics L- N V

Narrow focus: [Adj]_{FOC} L- 2P clitics V

The presence of a L target intervening between the adjective and clitic string in narrow focus would be of interest because of the common

split construction proposal of 1W placement implying a syntactic boundary at that same point, and because of phonological evidence from Radanović-Kocić (1988, 1996) placing a phonological break at the same point.

A number of syntacticians have analyzed the 1W placement as a split construction, no different than the left branch extraction shown in (10) from Wilder and Čavar (1994) below (Bošković 2001, Progovac 2005, Wilder and Čavar 1994).

(10) Left branch extraction

- a. Ivan *je* kupio zeleni auto.
Ivan is buy green car
'Ivan bought a green car.'
- b. **Zeleni** *je* Ivan kupio **auto**.
Green is Ivan buy car
'Ivan bought a green car. /
'It was a green car that Ivan bought.'

(10a) shows default word order while (10b) shows word order after extraction: the adjective has been moved before the 2P clitic. In (10a), *zeleni auto* 'green car' is not split and is a syntactic constituent, but in (10b), *zeleni* has been extracted to sentence-initial position. Similarly, for 1W placement in (11), *taj* has been extracted to sentence-initial position.

Interestingly, split constructions have been analyzed as being associated with contrastive focus (Bašić 2004, Pereltsvaig 2008), and Progovac (1996, 2005) proposed that the gloss for the split constructions in (9b) and (11) should reflect this.

- (11) **Taj** *je* **čovjek** pio pivo.
That is man drink beer
'That man drank beer.' /
'It was that man that drank beer.'

The syntactic break after the focused element from extraction discussed above matches with the location after focused elements the place where Radanović-Kocić (1988, 1996) proposed phonological breaks (marked as '[' below) which block degemination in /mojjorgan/ → [mojrgan], in (12a), as opposed to in (12b). For Radanović-Kocić, 1W

placement is acceptable only after a focus-induced break with focus on the word preceding the 2P clitic, as in (13a), and but not if focus is on the word following the 2P clitic, as in (13b).

We ran two production experiments investigating the interaction of 2P clitic placement, focus, and prosody, testing the hypotheses in (5), (7), and (9). Our first and main experiment varied clitic placement, clitic

(12) Degemination is blocked after a focus-induced break

- a. MOJ | jJorgan je od perja. /mojjorgan/ ↗ [mojorgan]
 My comforter is of dDown
 'MY comforter is made of down.'
- b. Moj JORGAN | je od perja. /mojjorgan/ → [mojorgan]
 My comforter is of down
 'My COMFORTER is made of down.'

(13) 1W placement allowed after focus-induced break

- a. MOJ | je jorgan od perja. (1W)
 b. *Moj je JORGAN | od perja. (1W)

string length, and focal domain in stimuli with sentence-initial subject Adj-N DPs, e.g. Adj 2P clitics N V (1W) and Adj N 2P clitics V (1C). A second experiment varied word length in a sentence-initial target word followed by 2P clitics *me je* under broad focus and narrow focus on the target word to investigate alignment of the L- target hypothesized in (9).

2 Experiments

2.1 Subjects

The subjects of this study were four Zagreb Croatian native speakers living in Los Angeles, California, labeled arbitrarily as S1-S4 (3 female, aged 39, 41, 60; 1 male, aged 61). While the speakers had been living in the United States for about fifteen years, all grew up and lived in Zagreb until at least their mid 20s and continue to speak Croatian currently.

The dialect of Zagreb Croatian was chosen: (i) to minimize the effect of lexical pitch accents on prosody of the recorded utterances, and (ii) to have speakers comfortable with and accustomed to using 1W placement. SC is traditionally described as a language with lexical pitch accents, but Smiljanić (2004) found that Zagreb Croatian speakers neutralize pitch

accent contrasts, utilizing stress accents rather than lexical pitch accents. Moreover, at least in journalistic prose, 1W placement is more frequent in Standard Croatian than Standard Serbian (Alexander 2008).

2.2 Stimuli/procedures

The sentences in the first experiment consisted of target sentence-initial subject DPs with trisyllabic initially stressed C[a]CVCV adjectives and nouns followed by pronominal and auxiliary clitics *me* and *je*. The factors were CLITIC PLACEMENT (1C, 1W) x CLITIC STRING LENGTH (1, 2) x FOCUS (broad, narrow on the adjective): (2 x 2 x 2) x 4 items x 5 repetitions for a total of 160 tokens + 65 fillers. The stimuli for the second experiment were also interspersed. This second experiment investigating the alignment of the L- target had the factors WORD LENGTH (1, 2, 3, 4 syllables) x FOCUS (broad, narrow): (4 x 2) x 6 items x 3 repetitions for a total of 144 tokens.²

Subjects were presented with slides with question/answer pairs. They were asked to read the slide silently and then read the answers out loud and were recorded onto a laptop at 22 kHz/16 bit through an external headworn Logitech Premium USB Headset 30 in a quiet room. A broad focus and a narrow focus question/answer pair for Experiment 1 is given in (14) and (15), and an example for Experiment 2 is given in (16).³

(14) Broad focus example, 1 clitic/1C

- a. Što *se* događa?
 what self happen
 'What's happening?'
- b. Manjina malina *me* mami danas.
 Manja_{POSS} raspberry me entice today
 'Manja's raspberry is enticing me today.'

(15) Narrow focus example, 2 clitics/1W

- a. Je *li* *Vas* Lukina malina Mamila?
 Is Q you Luka_{POSS} raspberry Entice
 'Did Luka's raspberry entice you?'

² For Experiment 2, tokens for 3 syllable words were reused from Experiment 1 tokens which included the clitic string *me je*.

³ All stimuli are listed in the Appendix in Yu (2008).

- b. (Ne,) MANJINA *me je malina mamila.*
 (No,) Manja_{POSS} *me is raspberry entice*
 ‘(No,) MANJA’s raspberry enticed me.’

(16) Experiment 2 example, 2 syllable word, narrow focus

- a. Je *li Vas tata nasamario?*
 Is Q you dad deceive
 ‘Did Dad deceive you?’
- b. (Ne,) Mama *me je nasamarila.*
 (No,) Mama me is deceive
 ‘(No,) MAMA deceived me.’

2.3 Analysis

The sentences were segmented and labeled for F0 landmarks using a wide band spectrogram supplemented by a waveform display and a F0 pitch track and analyzed for segment durations and timing and intonational parameters using Praat (Boersma and Weenink 2007) and statistical analyses were carried out in R (R Development Core Team 2007). Tonal landmarks, shown in Figure 2, were labeled for each utterance from extrema in the F0 contour: peaks H1 and H2 and valleys L2 and L3.⁴ These were named simply by order of occurrence in the speech signal, without reference to potential differences in prosodic function of the tonal targets in broad and narrow focus, and they are not intended to be labels directly corresponding to intonational pitch accent types, but simply phonetic annotations describing the F0 contour.

The statistical analyses performed were fixed-effects ANOVAs (CLITIC PLACEMENT, FOCUS, and CLITIC STRING LENGTH as fixed factors in Experiment 1, WORD LENGTH and FOCUS in Experiment 2) for each speaker, with the dependent variables being vowel durations, F0 values, and alignment of the tonal targets. For Experiment 2, correlational analyses were also performed between tonal target alignments and with segmental landmarks; these were done using nonparametric Spearman rank-order correlations with added jitter.

⁴ We also measured L1, the valley preceding H1 at the onset of the utterance, but did not analyze it because of the large number of stimuli with sentence-initial voiceless stops.

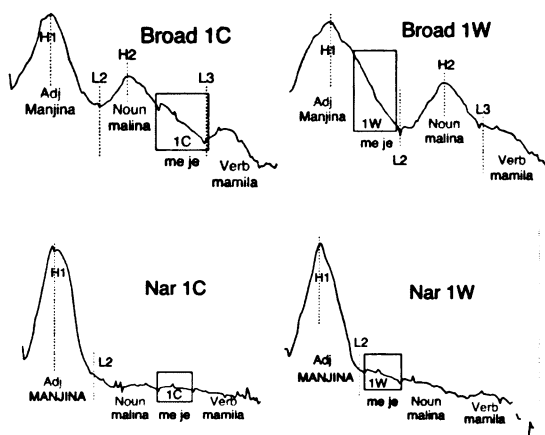


Figure 2. Schematic representation of labeled tonal targets for data analysis across CLITIC PLACEMENT and FOCUS conditions for sentences like (15b). The location of the 2P clitic string is boxed. In narrow focus, H2 and L3 (not shown) were not labeled on the basis of the F0 contour because of the post-focal pitch range compression; H2 was labeled at the offset of the second vowel in the noun and L3 at the offset of the first vowel in the verb for F0 comparisons between focus conditions.

3 Results and discussion⁵

We first present representative intonational contours in Section 3.1, and then address the prosodic realization of narrow focus, relevant to Hypotheses 2a and 3 in (7) and (9), in Section 3.2, and finally, discuss differences in the prosodic realization of 1C and 1W placements in broad focus, relevant to Hypothesis 2b in (7), in Section 3.3.

3.1 Representative intonational contours

We show some representative intonational contours below for sentences like (15b). Note in broad focus, that for 1W (on the right) compared to 1C (on the left), the alignment of the low target L2 is different, consistent

⁵ Due to space constraints, we present only main results in this paper; further details and quantitative results can be found in Yu (2008).

with Hypothesis 2b in (7). For 1C, L2 occurs after the onset of the noun *malina* but for 1W, it occurs in the clitic string before the noun onset.

The realization of narrow focus shown in the bottom row is similar to that found in Smiljanić (2004). However, note that the low target L2 discussed in (8) and (9) does not fall at the right edge of the focused sentence-initial element *Manjina*, but before the end of the focused element, for both 1C (on the left) and 1W (on the right) clitic placements, inconsistent with Hypothesis 3 in (9).

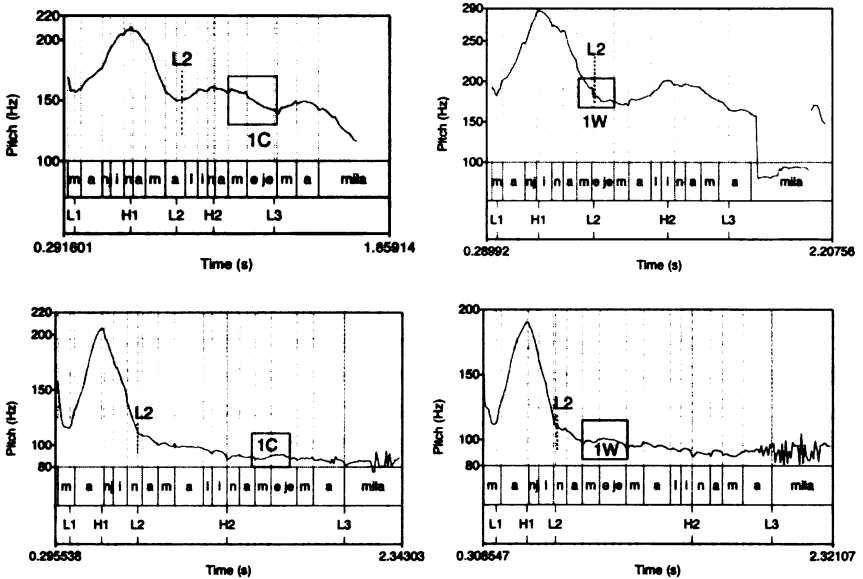


Figure 3. Representative intonational contours. Top left: broad focus, 1C, S4. Top right: broad focus, 1W, S1. Bottom left: narrow focus on adjective, 1C, S2. Bottom right: narrow focus on adjective, 1W, S2.

3.2 The realization of narrow focus

The prosodic realization of narrow focus is schematized below in Figure 4, comparing the pitch contour for broad focus on the left and narrow focus on the adjective on the right.

We found that Hypothesis 2a in (7) was not supported: there was no evidence for a tradeoff between prosodic and syntactic marking of narrow focus between 1C and 1W placements. There were no significant

differences in durations, F0 values, or tonal alignment between 1C and 1W placements in narrow focus on the adjective.

In addition, Hypothesis 3 in (9) was not supported: there was no evidence for a prosodic boundary before the 2P clitic string for 1W constructions in narrow focus on the adjective. While we expected the low tonal target to fall at the right edge of the focused element, as predicted by Radanović-Kocić (1988, 1996), Godjevac (2000, 2005), and Smiljanić (2004), we found instead that it was not a boundary tone, as shown in Figure 5, which shows results of the alignment of this low tone L2 in narrow focus across target word lengths from Experiment 2.

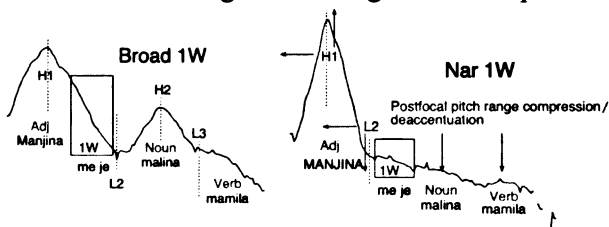


Figure 4. Schematic representation showing the prosodic realization of narrow focus on the adjective. Compared to broad focus, shown on the left, in narrow focus, the pitch peak on the adjective (H1) is retracted and higher, and there is postfocal pitch range compression/deaccentuation following the low target L2, which is also retracted.

From Experiment 2, ANOVAs and correlation analyses suggested that the low target following a narrowly focused sentence-initial element (L2) trailed the adjective peak (H1) and/or onset of the stressed vowel in the adjective at a fixed duration for each speaker.⁶ In other words, the L tone is not a boundary tone marking the end of a focused word. Instead, its function seems to be to enhance the F0 peak or the falling pitch by being near the peak. Since this tone is attracted to a stressed syllable, i.e., the peak, and since it controls the intonational contour over the post-focus string, we interpret this tone to be a focal phrase accent, as

⁶ See Section 3.2.2.2 in Yu (2008). For three speakers, there were no significant effects of WORD LENGTH on alignment between L2 and H1, and L2 and the onset of the stressed vowel in ANOVAs. Spearman's rank correlation coefficients for correlation of the alignment of L2 and H1, and L2 and onset of the stressed vowel, ranged from 0.53 to 0.88.

suggested by Godjevac (2000, 2005). We found that the alignment of this focal phrase accent did not interact with clitic placement at all.

3.3 Differences in prosodic realization of 1C and 1W in broad focus

While we found no significant differences in the prosodic realization of narrow focus between clitic placements, we did find differences between clitic placements in broad focus, consistent with Hypothesis 2b in (7).

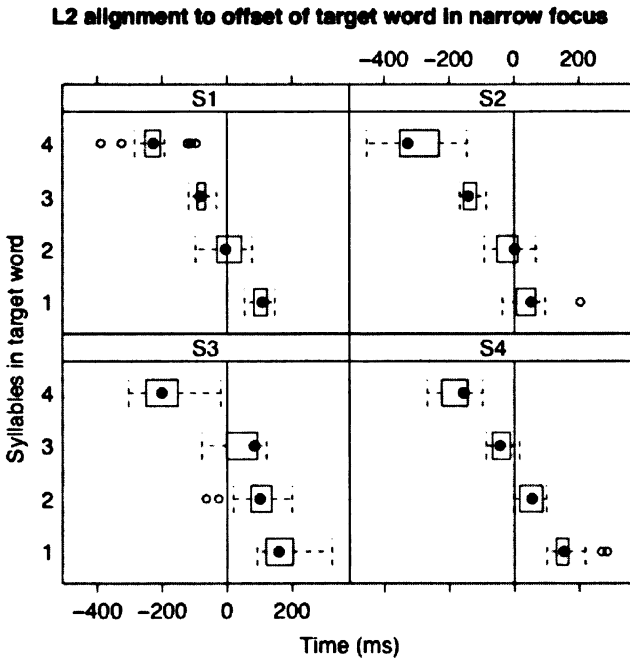


Figure 5. Alignment of the L2 low target following the narrowly focused sentence-initial target word to the offset of the target word (indicated by the vertical line at $x=0$) for all speakers S1-S4 and word lengths from 1 to 4 syllables. If L2 were a boundary tone falling at the right edge of the focused element, it would have aligned to the target word offset, the vertical line, across all target word lengths.

With the alignments of the tonal targets L2, H2, and L3 as shown below in Figure 6, we found that compared to 1C placement, 1W placement showed a significantly earlier L2 target (the low target

between the adjective and the noun) and H2 target (the noun peak) for all speakers, and a significantly later L3 target (the low target between the noun and the verb) for three speakers; see Figure 7.

Figure 8 displays one of the boxplots showing significant differences between tonal alignment for 1C and 1W in broad focus, as schematized in Figure 7. The boxplot compares L2 alignment to the onset of the noun in broad focus for 1C and 1W placements across all speakers S1-S4. It shows that for all speakers, L2 was aligned significantly earlier for 1W than 1C placements.

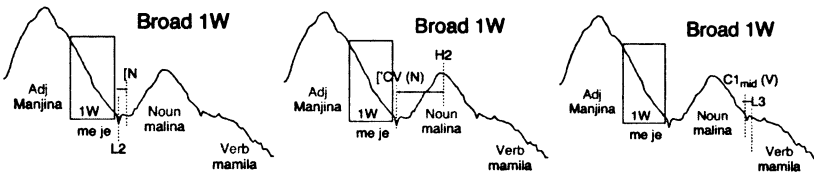


Figure 6. Alignment choices for L2, H2, and L3 for data analysis. These were used for both 1W and 1C placement (not shown). Left: L2 was aligned with respect to the onset of the noun. Center: H2 was aligned with respect to the onset of the noun. Right: L3 was aligned with respect to the midpoint of the initial consonant in the verb.

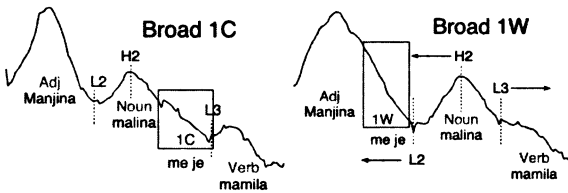


Figure 7. Schematic representation of differences in prosodic realization in broad focus between 1C (left) and 1W (right) clitic placements. All speakers had significantly earlier L2 and H2 targets in 1W placement compared to 1C, and three speakers had significantly later L3 targets in 1W placement.

4 Conclusions

In our production study on the interaction of alternation in second position clitic placement, prosody, and focus pragmatics in Zagreb Croatian, we found no interaction between clitic placement and prosody in narrow focus (against Hypothesis 2a in (7)). There was no evidence for a tradeoff in prosodic and syntactic marking of focus between 1C and 1W placement in narrow focus, with the idea that the 1W word split construction word order syntactically marked focus.

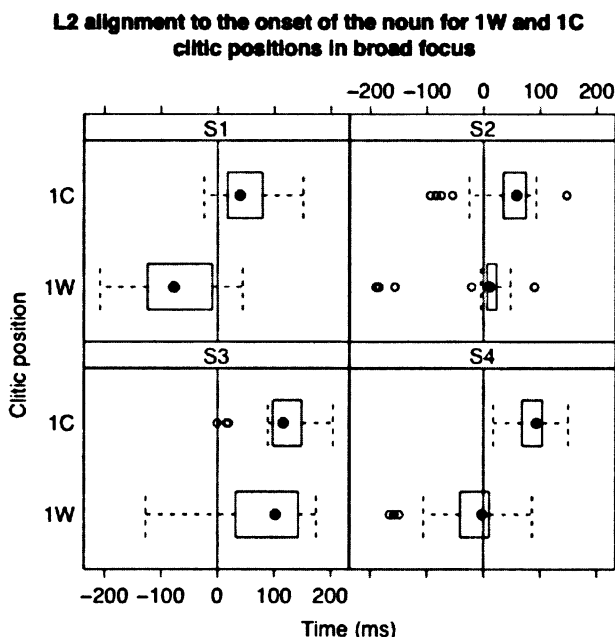


Figure 8. Alignment of L2 to the onset of the noun (indicated by the vertical line at $x=0$) in broad focus across clitic placements for all speakers S1-S4. L2 was significantly earlier for 1W placement for all speakers.

In addition, we found no evidence for L- aligned at the right edge of the focused element (against Hypothesis 3 in (9)), contrary to predictions based on Radanović-Kocić (1988, 1996), Godjevac (2000, 2005), and

Smiljanić (2004). Because the L- is not aligned at the right edge of the focused element, prosody cannot provide evidence for a prosodic/syntactic break following the focused element, as suggested by evidence from degemination in Radanović-Kocić (1988, 1996) and the split construction syntactic analysis of 1W placement, under an edge-aligned direct syntax-prosody mapping.

Finally, we did find tonal alignment differences between 1C and 1W placement in broad focus, in support of consistent with Hypothesis 2b in (7): there were differences in the prosodic realizations across clitic placements in broad focus. We need to do further work to fully understand what underlies these differences, but one interpretation of the earlier low target L2 and noun pitch peak H2 is that they are retracted together because they are part of a bitonal pitch accent on the noun, prosodically marking focus on the noun. The use of 1W placement in focusing the noun has been reported by our consultants and in Bošković (2001). This could be focal marking on the head of the DP, indicating DP-focus, and would be consistent with the hypothesis that 1W placement is inherently associated with focus. However, the interaction of 1W placement with focus pragmatics is complicated by additional interactions of 1W placement usage with dialect, idiolect, and register; understanding 2P clitic placement alternation requires investigation of these sociolinguistic factors as well.⁷

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⁷ For instance, further fieldwork in Zagreb after the completion of the work described here suggested that 1W placement can be felicitous or even preferred over 1C placement in broad focus for some Zagreb Croatian speakers, i.e. interaction of 1W placement with focus pragmatics is highly speaker-dependent.

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Tone and Stress in Prominence Based Prosodic Systems

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1 Introduction

This paper investigates prosodic systems characterized by interactions between two distinct phonological modules, tone and stress. While each module is characterized by a set of OT constraints, interactions across modules are governed by an interface constraint. The focus of the study is the Štokavian dialect group (Serbian and Croatian regional and standard idioms) which diverges into a range of regional subsystems (Ivić 1958, 1985). My central claim is that this dialectal divergence can be naturally captured as a factorial typology resulting from the interactions between constraints belonging to the phonological modules of tone and stress.¹ While consistent with the findings in de Lacy (2002), this study expands the range of predicted interactions, both on empirical and theoretical grounds.

Below are listed the constraints that figure in our analysis of the Štokavian dialects. Among the constraints on tone are a faithfulness constraint in (1) (cf. Yip 2002 and the references therein), and two markedness constraints: NO LONG-H in (2) which prohibits tone spreading (Yip 2002, Zec 1999) and BINARY-H in (3) which restricts multiple linking of tone (in the general spirit of Cassimjee and Kisseberth's (1998) proposal).

Constraints on TONE

- (1) IDENT-H Correspondent tones must be identical.
(2) NO LONG-H High tone may be associated with at most one TBU.

¹ Not all Štokavian dialects are characterized by pitch accent (Ivić 1958, 1985). Only those with pitch accent are the focus of this work. In the Štokavian dialects without pitch accent stress is the only type of word prominence.

- (3) **BINARY-H** High tone may be associated with at most two TBU's, i.e., with binary branching association lines.

The relevant constraints on stress are all well documented in the literature. One is **ALIGNHEAD_{PRWD}** in (4), which aligns the head of the prosodic word with one of its edges (McCarthy and Prince 1993); in Štokavian it is specified for the left edge. The other two are **WEIGHT-TO-STRESS** in (5) (Prince 1990), and **NONFINALITY** in (6) (Prince and Smolensky 1993).

Constraints on **STRESS**

- (4) **ALIGNHEAD_{PRWD}** Head of the prosodic word is aligned with the *left* edge of the prosodic word.
- (5) **WEIGHT-TO-STRESS** If heavy, then stressed.
- (6) **NONFINALITY** Head of the prosodic word may not be on the final syllable of the prosodic word.

The interactions between the tone and stress modules are governed by an interface constraint. This constraint, stated in (7), coordinates the assignment of prominence by the two modules. and requires that the head of the prosodic word (that is, the stressed syllable) should be associated with a High tone (cf. Lacy 2002, also Zec 1999).

- (7) **HEAD_{PRWD}/H** Head of the prosodic word is associates with a High tone.

There are three general types of interactions between tone and stress, as stated in (8):

- (8) Types of interactions between tone and stress:
- A. **STRESS** affects the place of **TONE**
 - B. **TONE** affects the place of **STRESS**
 - C. **STRESS** does not affect the place of **TONE**, nor does **TONE** affect the place of **STRESS**

This is illustrated in (9A-C), with tone represented by **IDENT-H**, and stress by **ALIGNHEAD_{PRWD}**. How tone and stress will interact is crucially determined by the ranking of the interface constraint, **HEAD_{PRWD}/H**. The

input in all tableaux is a trisyllabic form with a lexical High associated with its second syllable. In (9A), with the tone-related constraint dominated by both the stress-related and the interface constraint, the stressed syllable is initial and the High shifts to the left to satisfy the interface constraint.²

(9)A STRESS dominates TONE: ALIGNHEAD_{PRWD} >> IDENT-H

CaCaCa H	HEAD _{PRWD} /H	ALIGNHEAD _{PRWD}	IDENT-H
☞ a. CáCaCa H			*
b. CaCáCa H		*!	
c. CáCaCa H	*!		

In (9B), with the constraint on stress dominated by both the interface constraint and the constraint on tone, the stressed syllable coincides with the syllable that bears the lexical High tone.

(9)B TONE dominates STRESS: IDENT-H >> ALIGNHEAD_{PRWD}

CaCaCa H	HEAD _{PRWD} /H	IDENT-H	ALIGNHEAD _{PRWD}
a. CáCaCa H		*!	
☞ b. CaCáCa H			*
c. CáCaCa H	*!		

And in (9C), with the interface constraint dominated by both the stress-related and the tone-related constraint, the stressed syllable need not, and in this case does not, coincide with the syllable with the lexical High.

² In this typology, only tone is subject to faithfulness. Stress is subject to faithfulness only if it is diacritically marked in the input. None of the systems described here are of that type.

(9)C STRESS and TONE do not interact: dominated HEAD_{PRWD}/H

CaCaCa H	ALIGNHEAD _{PRWD}	IDENT-H	HEAD _{PRWD} /H
a. CáCaCa H		*!	
b. CaCáCa H	*!		
c. CáCaCa H			*

In (9A-C), interactions between tone and stress are *unidirectional*.³ However, with the right ranking of the tonal constraint in (2), NO LONG-H, tone may be allowed to spread, which results in *bidirectional* interactions between tone and stress. As shown in (11), while IDENT-H >> ALIGNHEAD_{PRWD}, that is, tone dominates stress, ALIGNHEAD_{PRWD} in turn dominates NO LONG-H, that is, stress dominates tone. As a result, the winning candidate is (11d) with its High tone linked both to its lexical sponsor and to the initial stressed syllable. The representations with multiple High tones should be interpreted as in (10), in observance of the OCP.

(10) CáCaCa stands for CáCaCa: a single High linked to two TBU

H H | /
 H

(11) Bidirectional interactions:

CaCaCa H	HEAD _{PRWD} /H	IDENT-H	ALIGNHEAD _{PRWD}	NO LONG-H
a. CáCaCa H		*!		
b. CáCaCa H	*!			
c. CaCáCa H			*!	
d. CáCaCa H H				*

³ There is a further important type, discussed in Bethin (2006), with only stress subject to faithfulness, and tone subject to markedness constraints, that we do not address here.

With the ranking between NO LONG-H and ALIGN HEAD_{PRWD} reversed, the High tone cannot spread, and we are back to unidirectional interactions.

In sum, while the *simple* interactions between tone and stress in (9A-C) correspond to attested language types (cf. de Lacy 2002), these are not the only language types that emerge. The more complex interaction in (11) yields language types with *bidirectional* interactions between tone and stress. Crucially, by virtue of violating the constraint against tone spreading, candidate (11d) satisfies all higher ranking constraints on tone, stress, and their interface.⁴

2 Background on the Štokavian dialect group

We now turn to the interactions of tone and stress in the Štokavian dialect group. As already noted, this dialect group diverges into a range of regional pitch accent idioms (Ivić 1958, 1985). The proposed analysis is that this is fully captured in terms of the mutual interactions between tone and stress, mediated through the interface constraint; and in terms of minimal differences in constraint rankings. While some of the resulting regional systems are characterized by unidirectional interactions, most are characterized by bidirectional interactions.

We begin with a major split of the Štokavian dialects, characterized in the literature as a split into the Old-Štokavian and Neo-Štokavian (Ivić 1976, Browne and McCawley 1965, Lehiste and Ivić 1986, Inkelas and Zec 1988, Zec 1993, 1999). The difference between these two dialects is illustrated in (12). The first column lists lexical (or underlying) forms with a linked High tone; the next two columns show how these lexical forms are realized in the Old- and Neo-Štokavian dialects. Crucially, in Old-Štokavian output forms, the High tone is linked to the same syllable as in the underlying form, while in the Neo-Štokavian, the High tone is linked both to its lexical sponsor and to the immediately preceding syllable, if there is one. Thus, the underlying forms (12a-i) have different realizations in the two dialects, while the forms in (12j-l), with the lexical High on the initial syllables, have identical realizations. Singly linked

⁴ For a full typology of tone spreading, which introduces further types of tone/stress interactions, see Cassimjee and Kisseberth's (1998).

Highs are traditionally referred to as falling accents, and spread Highs, as rising accents; only Neo-Štokavian has both types.

(12) Comparison of Old- and Neo-Štokavian forms:

Lexical Form	Old-Štokavian	Neo-Štokavian	Gloss
a. lopa _H ta	lopá _H ta	ló _H pa _H ta	'spade'
b. pi:ta _H la	pi:tá _H la	pí: _H ta _H la	'asked'
c. neprá: _H vda	neprá: _H vda	né _H pra: _H vda	'injustice'
d. jezi _H k	jezí _H k	jé _H zi _H k	'language'
e. na:ro _H d	na:ró _H d	ná: _H ro _H d	'people'
f. juna: _H k	juná: _H k	jú _H na: _H k	'hero'
g. rukavi _H ca	rukaví _H ca	ruká _H vi _H ca	'glove'
h. polju:bi _H la	polju:bí _H la	poljú: _H bi _H la	'kissed'
i. četina: _H rski	četiná: _H rski	četi _H na: _H rski	'evergreen'
j. bra _H t	brá _H t	brá _H t	'brother'
k. va _H tra	vá _H tra	vá _H tra	'fire'
l. vi _H dimo	ví _H dimo	ví _H dimo	'(we) see'

In Neo-Štokavian, all output forms in (12), other than (12g-i), are characterized by constraint interactions in tableau (11), as shown in (13). This is because all forms other than (12g-i) have a High tone linked underlyingly either to the second syllable, as in (12a-f), or to the first syllable, as in (12j-l). In the former case, stress is realized on the first syllable, and tone spreads to satisfy HEAD_{PRWD}/H, as in (13). In the latter case, all constraints are satisfied with no spreading of High, for the obvious reason.

(13) Neo-Štokavian: lopa_Hta in (12a) surfaces as ló_Hpa_Hta

lopa _H ta	HEAD _{PRWD} /H	IDENT-H	ALIGNHEAD _{PRWD}	NO LONG-H
a. ló _H pa _H ta		*!		
b. lópa _H ta	*!			
c. lopá _H ta			*!	
☞ d. ló _H pa _H ta				*

Forms in (12)g-i crucially show that tone spreading is restricted: tone may spread at most one TBU to the left. For this, we need to invoke the

constraint BINARY-H in (3), as shown in tableau (14). The undominated constraints thus are HEAD_{PRWD}/H, IDENT-H and BINARY-H.⁵

(14) Neo-Štokavian: rukavi_Hca in (12g) surfaces as ruká_Hvi_Hca

rukavica H	HEAD _{PRWD} / H	IDENT- H	BINARY- H	ALIGN HEAD _{PRWD}	NOLONG- H
a. rúkavi _H ca	*!				
b. rú _H kavica		*!			
c. rú _H ka _H vi _H ca			*!		*
d. ruká _H vi _H ca				*	*
e. rukaví _H ca				* *!	

The Old-Štokavian output forms in (12) are characterized by a minimal difference in constraint ranking: NOLONG-H ranks above ALIGNHEAD_{PRWD}, which precludes the spreading of High. As a result, stress falls on the syllables that sponsor lexical Highs, which are in turn linked only to their lexical sponsors.

In addition to the two dialects described in (12), one in which all lexical Highs are subject to spreading and the other in which none are, the full set of Štokavian dialects includes a number of systems with partial spreading. This dialectal divergence will be captured by the interactions of four constraints: the tonal constraint NOLONG-H, and the three constraints on stress listed in (4)-(6) – ALIGNHEAD_{PRWD}, which we already saw in action, as well as WEIGHT-TO-STRESS and NONFINALITY.

The constraints that do not play a role in dialectal divergence are the remaining two constraints on tone, IDENT-H in (1), which insures association of lexical High tone with its underlying sponsor, and BINARY-H in (3), which mandates restricted tone spreading, as well as the interface constraint in (7), which requires tonal association of the stressed syllable. These constraints are undominated in all Štokavian pitch accent systems (see tableau (14) for the Neo-Štokavian). That is, in all Štokavian pitch accent systems, the stressed syllable is associated with a High tone, High tone is minimally linked to its underlying

⁵ The form *rú_Hkavi_Hca is excluded by the undominated constraint NOGAP, which prohibits the skipping of tone bearing units by the spreading H(igh) (Yip 2002 and the references therein).

sponsor, and tone spreading is restricted to one TBU to the left. These constraints are thus crucially responsible for the overall prosodic profiling of Štokavian pitch accent systems.

A note is in order on the phonetic realization of the two types of pitch accent. Based on extensive phonetic studies, summarized in Lehiste and Ivić (1986), Ivić (1976: 34-35) characterizes the phonetic properties of Neo-Štokavian falling and rising accents as follows:

There is only one constant feature which assures the contrast between the so-called falling and the so-called rising accents in all regions where the Neo-Štokavian accentuation is used. This is the different pitch relation between the ‘accented’ and the first posttonic syllable. In words with a ‘falling’ accent the fundamental frequency peak of the accented syllable is much higher than that of the following syllable. In words with a rising accent the two peaks are usually on a similar level, and in many cases the peak of the second syllable is even higher.

This justifies the phonological characterization of both pitch accent types in terms of a lexical High tone, which spreads to a preceding syllable if there is one, and if the constraint interactions allow this. Ivić (1976: 35) further notes that the realization of pitch accents is subject to considerable variation “depending ... on the dialect, the speaker, and ... sentence intonation,” which is supported by somewhat different phonetic results from those in Lehiste and Ivić (1986) in recent important works, Godjevac (2000) and Smiljanić (2002).

3 Dialectal divergence in Štokavian pitch accent systems

Crucial for capturing the dialectal divergence in the Štokavian pitch accent systems are the interactions of the three stress-related constraints in (4)-(6) with one tonal constraint, NO LONG-H. In 3.1 we begin with the dialectal splits resulting from the interactions of NO LONG-H with only one stress-related constraint; in 3.2 we show further splits resulting from the interactions of NO LONG-H with two stress-related constraints; while 3.3 presents the full range of dialectal splits resulting from the interactions of NO LONG-H with all three stress-related constraints. The resulting factorial typology exhibits a close fit with the range of dialectal variation described in Ivić (1958, 1985).

As already noted, all Štokavian dialects investigated here have identical underlying forms. Constraint interactions will be exemplified with the forms in (12a-f), which vary along several relevant dimensions. All forms in (12a-f) have lexical tones linked to the second syllable, but the forms in (12a-c) are trisyllabic, while those in (12e-f) are disyllabic. Moreover, in (12a) and (12d) all syllables are light, in (12b) and (12e) the first syllable is heavy, and in (12c) and (12e) the second syllable is heavy; only syllables with long vowels are heavy in these dialects.

3.1 Dialectal splits due to NO LONG-H and ALIGNHEAD_{PRWD}

The Old- and Neo-Štokavian dialects discussed in section 2 are representative of a major dialect split. The Štokavian dialect group is divided into two major subgroups: the Neo-Štokavian, which allows violation of NO LONG-H to better satisfy ALIGNHEAD_{PRWD}, as in (16), and the Old-Štokavian, which does not, as in (15). Because each subgroup subsumes a number of regional dialects, we name the “pure” cases that emerge in (15) and (16) Old-Štokavian 1 and Neo-Štokavian 1, respectively.

(15) Old-Štokavian 1

CaCa _H Ca	NO LONG-H	ALIGNHEAD
Cá _H Ca _H Ca	*!	
☞ Ca:Cá _H Ca		*

(16) Neo-Štokavian 1

CaCa _H Ca	ALIGNHEAD	NO LONG-H
☞ Cá _H Ca _H Ca		*
Ca:Cá _H Ca	*!	

Example forms for these dialects were given in (12). Old-Štokavian 1 is spoken in Montenegrin regions such as Piperi (cf. Stevanović 1940, Inkelas and Zec 1988 and Zec 1993). Neo-Štokavian 1 is the most widespread Štokavian idiom that serves as a basis for both the Serbian and Croatian standards (cf. Milić 1952, Browne and McCawley 1965, Nikolić 1970, Inkelas and Zec 1988, Zec 1993).

In sum, the two major dialect groups crucially differ in the ranking of NO LONG-H and ALIGNHEAD_{PRWD}. The relative ranking of these two constraints will emerge as a defining signature of the two dialect groups.

3.2 Further dialectal splits due to WEIGHT-TO-STRESS

Further splits within the two major dialect groups are brought about by interactions of NO LONG-H and ALIGNHEAD_{PRWD} with WEIGHT-TO-STRESS. These constraints jointly yield the four pitch accent systems in (17)-(18).

(17) Old-Štokavian

a. Old-Štokavian 1

NO LONG-H >> ALIGNHEAD_{PRWD}, WEIGHT-TO-STRESS

b. Old-Štokavian 2

WEIGHT-TO-STRESS >> NO LONG-H >> ALIGNHEAD_{PRWD}

(18) Neo-Štokavian

a. Neo-Štokavian 1

ALIGNHEAD_{PRWD} >> NO LONG-H, WEIGHT-TO-STRESS

b. Neo-Štokavian 2

WEIGHT-TO-STRESS >> ALIGNHEAD_{PRWD} >> NO LONG-H

Both Old-Štokavian and Neo-Štokavian dialect groups include pitch accent systems in which syllable weight may impact the place of stress:, crucially, those in which WEIGHT-TO-STRESS dominates both NO LONG-H and ALIGNHEAD_{PRWD}, as in Old-Štokavian 2 and Neo-Štokavian 2. However, because these two constraints are ranked differently in the two dialect groups, interactions with WEIGHT-TO-STRESS will produce different outcomes.

We begin with the Old-Štokavian systems. In Old-Štokavian 1, NO LONG-H dominates both ALIGNHEAD_{PRWD} and WEIGHT-TO-STRESS, resulting in absence of tone spreading. In fact, in order to insure that stress falls on the syllable that sponsors lexical High tone, NO LONG-H will dominate every stress-related constraint in this dialect. In Old-Štokavian 2, however, WEIGHT-TO-STRESS dominates both NO LONG-H, and ALIGNHEAD_{PRWD}, resulting in a pitch accent system in which High tone spreads to the preceding heavy, but not to the preceding light syllable. Example forms are listed in (19), and tableau (20) shows constraint interactions for the trisyllabic forms; constraint interactions for the disyllabic forms are parallel with the trisyllabic cases. According to Ivić this dialect is spoken in Lepetane dialect in Boka Kotorska (Ivić 1985: 60) and the Smederevsko-Vršački dialect (Ivić 1985: 89).

(19) Old-Štokavian 2

CaCá _H Ca	lopá _H ta	CaCá _H	jezí _H k
Cá: _H Ca _H Ca	pí: _H ta _H la	Cá: _H Ca _H	ná: _H to _H d
CaCá: _H Ca	neprá: _H vda	CaCá: _H	juná: _H k

(20) Old-Štokavian 2

a. Ca:Ca _H Ca	W-TO-S	NOLONG-H	ALIGNHEAD
☞ Cá: _H Ca _H Ca		*	
Ca:Cá _H Ca	*!		*
b. CaCa _H Ca			
Cá _H Ca _H Ca		*!	
☞ CaCá _H Ca			*
c. CaCa: _H Ca			
Cá _H Ca: _H Ca	*!	*	
☞ CaCá: _H Ca			*

Note that, in the winning candidates in (20), High tone spreads to the preceding syllable, in violation of NOLONG-H, if that syllable is heavy, as in (20a), but not if it is light, as in (20b,c).

We next turn to the splits in the Neo-Štokavian dialects. In Neo-Štokavian 1, characterized by the ranking in (18a) (and already discussed in 3.1), WEIGHT-TO-STRESS is dominated by ALIGNHEAD_{PRWD} and therefore has no effect on tone spreading: High tone invariably spreads to the preceding syllable. In Neo-Štokavian 2, the dominating constraint is WEIGHT-TO-STRESS. Due to its interaction with the two dominated constraints ranked in the Neo-Štokavian fashion, ALIGNHEAD_{PRWD} >> NOLONG-H, High spreads from a light, but not from a heavy syllable, as documented in (21). This pattern characterizes certain pockets within the Neo-Štokavian region, Southern Banat in the north east (Ivić et al. 1994), and eastern parts of Bosnia (Ivić 1998: 285-6).

(21) Neo-Štokavian 2

Cá _H Ca _H Ca	ló _H pa _H ta	Cá _H Ca _H	jé _H zi _H k
Cá: _H Ca _H Ca	pí: _H ta _H la	Cá: _H Ca _H	ná: _H to _H d
CaCá: _H Ca	neprá: _H vda	CaCá: _H	juná: _H k

(22) shows that none of the winning candidates violates WEIGHT-TO-STRESS. The winners in (22a, b) violate NOLONG-H, while the winner in

(22c) violates $\text{ALIGNHEAD}_{\text{PRWD}}$. Only the evaluations of the trisyllabic forms are presented; the disyllabic forms follow the same pattern.

(22) Neo-Štokavian 2

a. Ca:Ca _H Ca	W-TO-S	ALIGNHEAD	NO LONG-H
☞ Cá: _H Ca _H Ca			*
Ca:Cá _H Ca	*!	*	
b. CaCa _H Ca			
☞ Cá _H Ca _H Ca			*
CaCá _H Ca		*!	
c. CaCa: _H Ca			
Cá _H Ca: _H Ca	*!		*
☞ CaCá: _H Ca		*	

To summarize, Old-Štokavian 2 and Neo-Štokavian 2, in which WEIGHT-TO-STRESS is the dominating constraint, exhibit partial spreading. In Old-Štokavian 2, High spreads to a heavy, but not to a light syllable; while in Neo-Štokavian 2, High spreads from a light, but not from a heavy syllable. In dialects with dominated WEIGHT-TO-STRESS , High either exhibits no spreading, as in Old-Štokavian 1, or spreads across the board, as in Neo-Štokavian 1.

3.3 Further dialectal splits due to NONFINALITY

A final split is due to NONFINALITY which, when ranked above NO LONG-H , induces High spreading from the final syllable. The result is a nonfinally positioned head of the prosodic word. We address splits in the Old-Štokavian in 3.3.1, and in the Neo-Štokavian, in 3.3.2.

With NONFINALITY added to the general picture, Old-Štokavian splits into five pitch accent systems. Old-Štokavian 1 and Old-Štokavian 2, discussed in the previous section, are characterized by a low ranking of NONFINALITY , which in these cases does not dominate any of the interacting constraints, as shown in (23) and (24).

(23) Old-Štokavian 1

$\text{NO LONG-H} \gg \text{ALIGNHEAD}_{\text{PRWD}}, \text{WEIGHT-TO-STRESS}, \boxed{\text{NONFINALITY}}$

(24) Old-Štokavian 2

$\text{WEIGHT-TO-STRESS} \gg \text{NO LONG-H} \gg \text{ALIGNHEAD}_{\text{PRWD}}, \boxed{\text{NONFINALITY}}$

Three further Old-Štokavian systems will emerge by permuting NONFINALITY with the other interacting constraints. In Old-Štokavian 3, with the ranking in (25), NONFINALITY outranks NOLONG-H and, as illustrated in (26), High spreads from a final, but not from a non-final syllable. This case is exemplified by the dialect spoken in the Bjelopavlići region of Montenegro, described in Ćupić (1977) (and analyzed in Zec 1993).

(25) Old-Štokavian 3

NONFINALITY >> NOLONG-H >> ALIGNHEAD_{PRWD}, WEIGHT-TO-STRESS

(26) Old-Štokavian 3

CaCá _H Ca	lopá _H ta	Cá _H Ca _H	jé _H zi _H hk
Ca:Cá _H Ca	pi:tá _H la	Cá: _H Ca _H	ná: _H ro _H d
CaCá: _H Ca	neprá: _H vda	Cá _H Ca: _H	jú _H na: _H k

Below are given evaluations of the disyllabic forms in (26), those with a lexical High on the final syllable. The winners in (27a-c) all have spread High tones. The trisyllabic forms in (26) follow the Old-Štokavian 1 pattern, that is, exhibit no spreading.

(27) Old-Štokavian 3: High on the final syllable

a. Ca:Cá _H	NONFINAL	NOLONG-H	ALIGNHEAD	W-TO-S
☞ Cá: _H Ca _H		*		
Ca:Cá _H	*!		*	*
b. CaCa _H				
☞ Cá _H Ca _H		*		
CaCá _H	*!		*	
c. CaCa: _H				
☞ Cá _H Ca: _H		*		*
CaCá: _H	*!		*	

In Old-Štokavian 4, with the ranking in (28), High spreads from all final syllables; and, from nonfinal syllables, only to a preceding heavy. Thus, while High spreads from all final syllables, regardless of their weight, spreading from non-final syllables is governed by WEIGHT-TO-STRESS. This is because WEIGHT-TO-STRESS, which outranks NOLONG-H, emerges as an active player only when the higher ranked

NONFINALITY is out of the picture, that is, when High resides on a non-final syllable, exemplified here by the trisyllabic forms. This pattern is found, according to Ivić (1998: 644), in the dialect spoken in Uljma (Vršac); examples are given in (29).

(28) Old-Štokavian 4

NONFINALITY >>WEIGHT-TO-STRESS >>NOLONG-H >>ALIGNHEAD_{PRWD}

(29) Old-Štokavian 4

CaCá _H Ca	lopá _H ta	Cá _H Ca _H	jé _H zi _H k
Cá: _H Ca _H Ca	pí: _H ta _H la	Cá: _H Ca _H	ná: _H ro _H d
CaCá: _H Ca	neprá: _H vda	Cá _H Ca: _H	jú _H na: _H k

All forms in (29) are evaluated in (30). The tableaux (30a-c) evaluate forms with lexical High on the final syllable. All winning candidates exhibit spreading, induced by the dominating status of NONFINALITY. In tableaux (30d-f), which evaluate forms with lexical Highs on a non-final syllable, NONFINALITY is irrelevant and WEIGHT-TO-STRESS takes over, insuring spreading to a heavy syllable, as in (30d), but not to a light one, as in (30e) and (30f); in the latter two cases, the winning candidates have stress on syllables linked to unspread High tones.

(30) Old-Štokavian 4

High on a final syllable

a. Ca:Ca _H	NONFINAL	W-TO-S	NOLONG-H	ALIGNHEAD
☞ Cá: _H Ca _H			*	
Ca:Cá _H	*!	*		*
b. CaCa _H				
☞ Cá _H Ca _H			*!	
CaCá _H	*!			*
c. CaCa: _H				
☞ Cá _H Ca: _H		*	*	
CaCá: _H	*!			*

High on a nonfinal syllable

d. Ca:Ca _H Ca	NONFINAL	W-TO-S	NO LONG-H	ALIGNHEAD
☞ Cá: _H Ca _H Ca			*	
Ca:Cá _H Ca		*!		*
e. CaCa _H Ca				
Cá _H Ca _H Ca			*!	
☞ CaCá _H Ca				*
f. CaCa: _H Ca				
Cá _H Ca: _H Ca		*!	*	
☞ CaCá: _H Ca				*

In Old-Štokavian 5, the crucial ranking is WEIGHT-TO-STRESS >> NONFINALITY >> NO LONG-H, as shown in (31). In this case, again, forms with lexical Highs on final syllables follow a different pattern from forms with lexical Highs on non-final syllables. A lexical High on a final syllable spreads only when this syllable is light, while a lexical High on a non-final syllable spreads only to a preceding heavy syllable, as This is illustrated in (32). This pattern has not been attested, which I take to be an accidental gap.

(31) Old-Štokavian 5

WEIGHT-TO-STRESS >> NONFINALITY >> NO LONG-H >> ALIGNHEAD_{PRWD}

(32) Old-Štokavian 5

CaCá _H Ca	lopá _H ta	Cá _H Ca _H	jé _H zi _H k
Cá: _H Ca _H Ca	pí: _H ta _H la	Cá: _H Ca _H	ná: _H to _H d
CaCá: _H Ca	neprá: _H vda	CaCá: _H	juná: _H k

Forms with lexical High on the final syllable are evaluated in (33). Here, High spreads from a light syllable, as in the winning candidates in (33a) and (33b), but not from a heavy one. The winning candidate in (33c), in which the syllable linked to the lexical High is heavy, bears stress on this syllable. Forms with lexical Highs on a non-final syllable follow the Old-Štokavian 2 pattern, as in (20); the ranking WEIGHT-TO-STRESS >> NO LONG-H enforces spreading onto a heavy syllable.

(33) Old-Štokavian 5: High on a final syllable

a. Ca:Ca _H	W-TO-S	NONFINAL	NOLONG-H	ALIGNHEAD
☞ C ^á : _H Ca _H			*	
Ca:C ^á _H	*!	*		*
b. CaCa _H				
☞ C ^á _H Ca _H			*!	
CaC ^á _H		*!		*
c. CaCa: _H				
C ^á _H Ca: _H	*!		*	
☞ CaC ^á : _H		*		*

The four interacting constraints yield three distinct Neo-Štokavian pitch accent systems. In Neo-Štokavian 1 and Neo-Štokavian 2, NONFINALITY is inert. As shown by the rankings in (34) and (35), NONFINALITY does not dominate any of the relevant interacting constraints in either of these dialects.

(34) Neo-Štokavian 1

ALIGNHEAD_{PRWD} >> NOLONG-H, WEIGHT-TO-STRESS, NONFINALITY

(35) Neo-Štokavian 2

WEIGHT-TO-STRESS >> ALIGNHEAD_{PRWD} >> NOLONG-H, NONFINALITY

Ranking permutations over (34), with NONFINALITY promoted towards the top of the ranking, does not yield any new systems. Thus, the ranking in (36), in which NONFINALITY is the highest ranked constraint yields a pitch system non-distinct from Neo-Štokavian 1.

(36) Neo-Štokavian 3 same as Neo-Štokavian 1

NONFINALITY >> ALIGNHEAD_{PRWD} >> NOLONG-H, WEIGHT-TO-STRESS

This is because the effect of NONFINALITY is redundant with respect to the effect of ALIGNHEAD_{PRWD} which shifts stress to the left and induces concomitant tone spreading (due to ALIGNHEAD_{PRWD} >> NOLONG-H) from all syllables associated with lexical Highs. The effect of NONFINALITY is identical, but restricted to word final syllables.

Ranking permutations over (35) yield two pitch accent systems. Neo-Štokavian 4, with the ranking in (37), is non-distinct from Neo-Štokavian 2. Because it outranks NONFINALITY, WEIGHT-TO-STRESS undoes its effect, which restricts the relevant interactions to WEIGHT-TO-STRESS and ALIGNHEAD_{PRWD}, as in Neo-Štokavian 2.

(37) Neo-Štokavian 4, same as Neo-Štokavian 2

WEIGHT-TO-STRESS >> NONFINALITY >> ALIGNHEAD_{PRWD} >> NO LONG-H

However, the ranking in (38) yields a distinct system, Neo-Štokavian 5, in which lexical High spreads from all final syllables, and from light non-final syllables, as exemplified in (39). According to Ivić (1998: 279-80), this dialect is spoken in Vijaka (Vareš).

(38) Neo-Štokavian 5

NONFINALITY >> WEIGHT-TO-STRESS >> ALIGNHEAD_{PRWD} >> NO LONG-H

(39) Neo-Štokavian 5

Cá _H Ca _H Ca	ló _H pa _H ta	Cá _H Ca _H	jé _H zi _H k
Cá: _H Ca _H Ca	pi: _H ta _H la	Cá: _H Ca _H	ná: _H ro _H d
CaCá: _H Ca	neprá: _H vda	Cá _H Ca: _H	jú _H na: _H k

In the tableaux in (40), all input forms contain lexical Highs on word final syllables, and in each, the winning candidates has a spread High, and stress is non-final. This effect is due to the ranking NONFINALITY >> WEIGHT-TO-STRESS.

In forms with lexical Highs on non-final syllables, NONFINALITY is of course irrelevant and WEIGHT-TO-STRESS takes over. These forms follow the pattern of Neo-Štokavian 2, with High spreading from a light syllable, but not from a heavy syllable, as in (22).

(40) Neo-Štokavian 5: High on a final syllable

a. Ca:Ca _H	NONFINAL	W-TO-S	ALIGNHEAD	NO LONG-H
☞ Cá: _H Ca _H				*
Ca:Cá _H	*!	*	*	
b. CaCa _H				
☞ Cá _H Ca _H				*
CaCá _H	*!		*	
c. CaCa: _H				
☞ Cá _H Ca: _H		*		*
CaCá: _H	*!		*	

4 Conclusion

To summarize, the four interacting constraints, one on tone and three on stress, yield a factorial typology with five Old-Štokavian and three Neo-Štokavian systems, all but one attested. This typology states conditions under which spread Highs, that is, rising accents, may arise in both Old- and Neo-Štokavian dialects. In our analysis, the crucial difference between the two dialect groups is captured by the ranking of ALIGNHEAD_{PRWD} and NO LONG-H, as stated in (15)-(16). The Neo-Štokavian ranking maximizes spread High tones, that is, rising accents, while the Old-Štokavian ranking maximizes unspread Highs, that is, falling accents. Further constraint interactions, which are responsible for pitch accent systems with partial spreading, induce the occurrence of rising accents in the Old-Štokavian; and block their occurrence in the Neo-Štokavian.

The analysis proposed here captures the implicational relations stated in Ivić (1991): that, if a High spreads from a heavy syllable, it also spreads from a light syllable; if a High spreads from a heavy syllable, it also spreads from a light syllable; and, if a High spreads from a nonfinal syllable, it also spreads from a final syllable. These implicational relations circumscribe the range of possible Štokavian pitch accent systems. The typology that emerges from our analysis excludes the non-occurring pitch accent systems in (41):

(41) Non-occurring pitch accent systems:

- a. High spreads from a heavy, but not from a light syllable.
- b. High spreads to a light, but not to a heavy syllable.
- c. High spreads from a nonfinal, but not from a final syllable.

Crucially, however, the non-occurring systems in (41), are typical of stress systems rather than of tone systems. This stress-like behavior of tone is due to bidirectional interactions between tone and stress in the Štokavian pitch accent systems: while the interace constraint in (7) and the undominated constraints on tone, (1) and (3), circumscribe the domain of interactions between tone and stress, constraints on stress interact with the tonal constraint on tone spreading, thus exerting concomitant optimization of tone and stress.

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