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Chapter 1

Situation relatives: Deriving causation, concession, counterfactuality, condition, and purpose

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Building on previous work on the syntax and semantics of subordinate clauses, Arsenijević2006 argues that all subordinate clauses are derived by a generalized pattern of relativization. One argument in the clause is abstracted, turning the clause into a predicate over the respective type. This predicate combines with an argument of that type in another expression and figures as its modifier. The traditional taxonomy of subordinate clauses neatly maps onto the taxonomy of arguments – from the arguments selected by the verb to the temporal argument, or the argument of comparison. One striking anomaly is that five traditional clause types – conditional, counterfactual, concessive, causal, and purpose clauses – are best analyzed as involving abstraction over the situation argument. In this paper, I present a situation-relative analysis of the five types of subordinate clauses, where their distinctive properties range in a spectrum predicted by their compositional makeup. I argue that they all restrict the situation argument selected by a speech act, attitude, or content predicate of the matrix clause, and hence effectively restrict this predicate. This gives the core of their meaning, while their differences are a matter of the status of an implication component common for all five types, the presupposition of truth for the subordinate and matrix clause, and an implicature of exhaustive relevance of the former. Predictions of the analysis are formulated, tested, and confirmed on data from English and Serbo-Croatian.

Keywords: relativization, subordinate clauses, Serbo-Croatian, situation semantics



1 Introduction

It has been argued for a large number of subordinate clauses that they are derived through strategies of clause relativization, henceforth relative strategies, i.e., that they underlyingly represent special types of relative clauses. Geis1970, Larson1987; Larson1990, and others discuss locative and temporal adjunct clauses – see in particular Demirdache2004, Haegeman2009 for temporal clauses, Aboh2005, Caponigro.Polinsky2008, Arsenijevic2009a, Manzini.Savioia2003, Haegeman2010 for complement clauses, Bhatt.Pancheva2006, Arsenijevic2009b for conditional clauses. Arsenijevic2006 explicitly argues that all subordinate clauses are underlyingly relative clauses (see also Haegeman.Urogdı2010a; Haegeman.Urogdı2010b). This view is supported by the fact that all subordinate clauses can be shown to involve a gap, i.e., an abstracted constituent, that they are all one-place predicates, that they all relate to an argument in their immediate matrix clause (arguments of prepositions, temporal arguments, and other non-canonical arguments), that they are very often introduced by *wh*-items (in most cases shared with narrow relatives), and that they typically yield island effects and show the divide between restrictive and non-restrictive interpretations, and between the high and the low construal (Larson1987; Larson1990).

The traditional classification of subordinate clauses is based on an ontological hybrid combining the meanings related to thematic roles (temporal, locative, causal clauses) and the syntactic positions (complement, subject clauses). In the relativization analysis, this ontology maps to the taxonomy of (overt or covert) constituents of the matrix clause, which receive clausal modification. Temporal clauses modify a temporal argument (1a), locative clauses a spatial one (1b), complement clauses modify an argument selected by a verb or preposition (1c), consequence/result clauses modify a degree argument (1d), etc.

- (1) a. When John gets up, Mary will be gone.
 ≈ Mary is gone at a future time, which is the time at which John wakes up.
- b. John saw Mary where he expected her the least.
 ≈ John saw Mary at the place at which he expected her the least.
- c. John heard that Mary was ill.
 ≈ John encountered the hearsay according to which Mary was ill (with some simplification, see Arsenijevic2009a for a detailed analysis).
- d. John sang so badly that the plants were dying.
 ≈ John sang at a degree of badness that killed the plants.

Five of the traditional classes of subordinate clauses receive the same description: causal, conditional, counterfactual, purpose, and concessive clauses on this approach all modify the situation argument in the matrix clause which is targeted by a speech act, content or attitude predicate over the matrix clause. Consequently, all these traditional types of subordinate clauses are either predicates over situations or expressions referring to situations.

The question emerges why subordinate clauses which modify the same argument in the matrix clause and match the same type (situations) are traditionally divided into five different clause types and attributed five different traditional types of meanings. The aim of this paper is to outline finer properties which derive the different semantic intuitions and how they are enabled by their compositional make up in order to maintain the view that all subordinate clauses are relatives.

Matrix clauses taking situation-relatives may occur as root clauses (arguments of speech act predicates) or as complement clauses under attitude and content predicates (2a). In the former case, they may express assertion (2b), question (2c), or imperative semantics (2d).

- (2) a. Bill believes that if John has a deadline, he stays late.
- b. If John has a deadline, he stays late.
- c. If John has a deadline, will he stay late?
- d. If you have a deadline, stay late!

In this paper, for simplicity, I only consider the simplest case in which the matrix clause is asserted. The entire analysis easily extends to other contexts (to other predicates over the situation variable selecting the matrix clause) with due accommodations, such as speaking of the time of epistemic evaluation of the matrix clause instead of the assertion time. I also consider the simplest case in which the epistemic evaluation is anchored in the actual situation. Again, the view straightforwardly extends to cases with other anchor situations.

With Barwise.Perry1983 and Kratzer2010, I assume that every speech act is about situations and refer to these situations as TOPIC SITUATIONS. I distinguish topic situations (those updated by the speech act) from described situations (those corresponding to the eventuality projecting the clause), and I represent topic situations with a situation variable which occurs as an argument of the speech act predicate together with the described situation (hence the speech act performs an operation on the relation between the topic situation and the described situation). Crucially, due to their high structural position, I take it that free topic situation variables receive a generic interpretation.

Let me briefly sketch the proposed model before giving a more detailed elaboration in §2. In the prototypical case, which I argue to be the conditional clause, the topic situation is a free variable, hence generically interpreted. The subordinate clause is a restrictive relative and it modifies the generic topic situation of the assertion in the matrix clause. The result is that the matrix proposition is generically asserted (it is generically a property of described situations) in the domain of the restricted topic situation, i.e., for the situations in which the subordinate proposition obtains. This is logically equivalent with the implication from the proposition in the subordinate clause to that in the matrix clause. Let me illustrate this.

In the sentence in (3a), that John stays late is generically asserted for the topic situations in which he has a deadline. In other words, for the set of situations in which John has a deadline, the speaker generically asserts that John stays late. This is logically equivalent to an implication from John having a deadline to him staying late. Each of the other clause types analyzed here as situation-relatives involves additional components. In particular in the case of concessive, causal, and purpose clauses, these additional components include specific or definite reference instead of the generic interpretation, as discussed in more detail in §2 and §3.

In (3), I provide examples of each of the five clause types with paraphrases illustrating the intended relativization analysis, including a rough indication of these additional components.

- (3) a. *Conditional*
John stays late if he has a deadline.
≈ For situations in which John has a deadline, it is asserted that he stays late.
- b. *Counterfactual*
John would have stayed late if he had a deadline.
≈ For situations in which John has a deadline, it is asserted that he stays late.
Presupposition: John has no deadline in the actual situation.
- c. *Concessive*
John stays late, even though he has no deadline.
≈ For the actual situation, in which John has no deadline, he stayed late.

d. *Causal*

John stays late because he has a deadline.

≈ For the actual situation, in which John has a deadline, he stayed late.

e. *Purpose*

John stays late in order to meet the deadline.

≈ For the actual situation, which is part of a set of situations in which in the future John meets the deadline, John stays late.

I argue that all five clause types involve an implication relation between two propositions. One important asymmetry contributing to the differences between the five clause types is whether this implication is asserted or presupposed. It is therefore important for the proposed model that in the cases where the implication is presupposed, a difference should be made between the presupposed implication and (the propositions expressed by the subordinate and the matrix clause of) the sentence. Exactly the relation between the presupposed implication and the two clauses will be important for the derivation of the respective meanings. Whether asserted or presupposed, the implication, to which I refer as the relevant implication, maps onto the sentence involving a situation-relative so that the situation-relative expresses its antecedent, or makes an assertion about it, as elaborated in §2, while the matrix clause universally expresses its result (i.e., asserts it, interrogates about it or makes a performative act – depending on the illocutionary force of the sentence).

I argue that the relevant implication is a matter of assertion and thus its antecedent is expressed by the subordinate clause, in conditional and counterfactual clauses, and that it is presupposed in causal, concessive, and purpose clauses. I argue that the underlying generalization is that the implication is asserted when the subordinate clause is a restrictive relative and presupposed when it is non-restrictive because restrictive relatives restrict the topic situation and non-restrictive relatives are known to be speech acts in their own right.

For illustration, as already sketched in (3a), restricting the generic assertion that John stays late to topic situations in which John has a deadline derives the interpretation that John having a deadline implies him staying late. Applying it to the example in (3c), it is asserted that John stays late for the actual situation which is a situation in which he has no deadline. This is interpreted on the background of a presupposed implication that John having a deadline implies him staying late. The meaning obtains that John stays late in a situation which does not imply staying late. A detailed analysis of all five clause types follows in §2.

Whether the relevant implication is asserted or presupposed is actually epiphenomenal to a structural asymmetry. Relative clauses can be restrictive or non-restrictive, and this applies to situation relatives too. Restrictive situation-relatives combine with the topic situation before the assertion applies to it. The combination, as elaborated in §2, derives the meaning of implication and the assertion then applies to it, resulting in an asserted implication. Conditionals and counterfactuals are derived in this way.

In non-restrictive relatives, generally, the relative pronoun behaves in many ways like a regular pronoun (e.g., Vries2002) which is co-referential with the modified expression. The modified expression needs to be definite (or at least specific).

Applied to non-restrictive situation-relatives, this means that they have their own topic situation, which is co-referential with the topic situation of the matrix clause (the expression it modifies). This topic situation must be definite or specific, and by default a definite topic situation is the actual situation. Finally, they make their own assertion about the same topic situation as in the matrix clause, by default the actual situation. This is the case in the other three clause types: causal, concessive, and purpose clauses. In the case of purpose clauses, the fact that the proposition in the subordinate clause cannot be epistemically evaluated at the assertion time (because the time targeted by the proposition comes after the assertion time) prevents the non-restrictive relative from being a full-fledged assertion.

One more asymmetry concerns the relation between the proposition in the subordinate clause and the actual situation. Counterfactuals mark that the proposition is false for the actual situation, conditional clauses do not specify any relation of this type, causal clauses assert that the antecedent is true in the actual situation, concessive clauses that it is false, and purpose clauses assert a modal relation between the proposition in the subordinate clause and the actual situation (as explained in more detail in §2).

A final asymmetry concerns the relevance of the antecedent of implication. An implicature may or may not be triggered that the antecedent of the implication involved in the interpretation of the situation-relative is the only relevant antecedent for the given result in the discourse. This property, which I label implicature of exhaustive relevance, contributes to the derivations of the meaning of cause and purpose, and also to the derivation of particular special cases of the interpretations of other clause types under discussion (e.g., the meaning of a necessary condition in conditionals). Coming through implicature, it varies in strength depending on the semantic content of the clause and the context, which

is why causal clauses range from those with a real causal reading to those denoting just a fulfilled condition.

It can be summarized that the different flavors of each of the five types of situation-relatives, i.e., their specific interpretations: condition, counterfactuality, concession, cause, and purpose, all derive from particular values of five independently attested properties:

- restrictive vs. non-restrictive nature of the situation-relative,
- the status of the implication: is it asserted or presupposed, and is its antecedent matched with or excluded by the subordinate clause,
- the match with the antecedent of the implication: whether the subordinate clause presupposes it to be false, asserts it, negates it, or modally addresses it,
- the relation between the proposition in the subordinate clause and the actual situation: no commitment, presupposition of falsity, assertion of truth, assertion of falsity or assertion of possibility, and
- exhaustive relevance of the antecedent of the implication.

In §2, I elaborate on these five properties for each of the clause types. The discussion is based on English examples and more generally targets languages which employ the strategies under discussion. §3 departs from the prediction of the outlined analysis that the five properties will have overt lexical and/or morphological realization in at least some languages and shows confirmations from Serbo-Croatian, a language with a rich system of subjunctions (I use this term for the words which introduce subordinate clauses) and verb forms. §4 concludes the paper.

2 Characteristic properties of the marked situation-relatives

In this section, I examine the five classes of situation-relatives: conditional, counterfactual, concessive, causal, and purpose clauses for their behavior regarding the five relevant properties introduced above.

Let me begin by observing a striking parallel between four of the five clause types under discussion and the logical operation of implication – which has traditionally been closely linked with conditional clauses. Leaving aside the purpose

clauses which, as will be argued, present the strongest marked class, the remaining four types: conditional, counterfactual, concessive, and causal clauses match, respectively, the abstract notion of implication as such and the three combinations of truth values of its arguments which allow for the entire implication to be true: FF , FT , and TT (see Table 1).

Table 1: The mapping between the salient cases of the logical implication and situation-relatives

p	q	$p \rightarrow q$	
F	F	T	conditional
T	T	T	counterfactual
F	T	T	causal
T	F	F	concessive
			not salient

More precisely, an implication in which p is ‘John has a deadline’ and q is ‘John stays late’ figures in each of the examples in (4) – by presupposition or by assertion. Conditionals and counterfactuals, as in (4a), (4b), assert it (more precisely, they restrict a generic assertion to the topic situations in which the subordinate clause is true). Counterfactuals additionally presuppose that the antecedent does not hold for the actual situation with an implicature that the result does not either. Causal and concessive clauses, as in (4c) and (4d) respectively, presuppose the implication. Causal clauses assert that the antecedent and the result of the presupposed implication are true in the actual situation, and concessive clauses that the result and the negated antecedent are true in the actual situation (i.e., that the antecedent is false).

- (4) a. If John has a deadline, he stays late.
 b. If John had a deadline, he would have stayed late.
 c. John stays late because he has a deadline.
 d. Although John has no deadline, he stays late.

It appears that under pragmatic pressure language has developed classes of expressions which use various means to reach the general meaning of implication and the three salient combinations of truth values of its arguments. In the rest of this section, I discuss the ways these pragmatic meanings are semantically derived – in terms of the five previously sketched properties for each of the clause types under discussion.

2.1 Conditional clauses

Conditional clauses are the default case: they are restrictive relatives which restrict a generic topic situation of the assertion in the matrix clause without a necessary commitment or presupposition that the actual situation is among them. This derives the meaning of an asserted implication. In the examples in (5), restricting the generic assertion that John stays late to the situations in which he has a deadline amounts to asserting that him having a deadline implies him staying late, restricting the generic assertion that Mary misses the football match to situations in which she goes to bed amounts to asserting that Mary going to bed implies missing the football match, and restricting the generic assertion that they cannot hear the phone to situations in which they sing amounts to asserting that them singing implies them not hearing the phone.¹

- (5) a. If John has a deadline, he stays late.
 b. If Mary goes to bed, she will miss the football match.
 c. If they are (indeed) singing, they cannot hear the phone.

The topic situation is not the actual situation and no presupposition about the actual situation is necessarily involved, so the question how the subordinate clause matches with its antecedent does not obtain and no exhaustive relevance of the antecedent is necessarily implicated, either.

2.2 Counterfactual clauses

Counterfactual clauses are well known to presuppose that the condition does not obtain in the actual situation (Lewis:1973). Consider the examples in (6). They presuppose, respectively, that John had stayed late, that Mary hasn't studied, and that the speaker of the sentence has been born.

¹As one anonymous reviewer correctly points out, the sentences in (5) yield intuitions about a different degree of genericity: (5a) seems to be more generic than (5b) and (5c). This distinction reflects the fact that in the latter two cases, in addition to the generic meaning of the sentence, there is a particular situation that satisfies the relevant predicates. This is similar to seeing a moose in the field, and saying generically: *The moose will attack the intruder with its horns*. It should, however, be noted that the presupposed implication does not have to involve the narrow restrictions expressed by the subordinate and main clause: it may rest on their supersets. Therefore, the relevant implication in (5b) could be that going to bed implies missing the events that take place during the period immediately after. As this issue opens a whole new set of questions, I leave it for further research.

- (6) a. Hadn't John stayed late, he would have missed the deadline.
b. If Mary had studied, she would have passed the test.
c. It would've been better if I had never been born at all.

Like in conditional clauses, the subordinate clause in counterfactuals is a restrictive relative targeting a generic topic situation in the matrix clause. As a consequence, this combination too amounts to asserting the implication (not staying late implies missing the deadline, studying implies passing the test, not being born implies higher desirability). In addition to effectively expressing the antecedent of the implication, the subordinate clause carries a presupposition that it is false in the actual situation. Exhaustive relevance of the antecedent for the result is not a necessary ingredient. It does, however, figure as a prominent interpretation: when the antecedent of the asserted implication is presupposed to be the only relevant one for the given result, this leads to the implicature that the result is false in the actual situation (if only one kind of situations is relevant for another to obtain and it fails, then a situation of the latter kind likely does not obtain). The implicature, however, may be cancelled (the sentences in (6a)-(6b) allow for the respective continuations: ... *But eventually, he missed it anyway*; ... *Without studying – she still somehow managed*), except when the semantics of the sentence prevents cancellation (such is, e.g., the effect of the comparison between sets of situations in (6c), which excludes the possibility that the result obtains; one cannot sensibly continue this example with: ... *But it nevertheless turned out to be better than it is*).

2.3 Concessive clauses

Concessive clauses do not assert the relevant implication but rather introduce it by presupposition (in (7): having a deadline implies staying late, being hungry implies eating, being young implies being impatient).

- (7) a. John stayed late even though he had no deadline.
b. Mary ate, although she wasn't hungry.
c. Although she's young, she's not impatient.

Concessive clauses are non-restrictive situation-relatives. Non-restrictive relatives make their own assertions and their relativized argument behaves as a pronoun co-referential with the modified expression rather than as a bare lambda-abstractor, as shown, e.g., in Vries2002. Consider the examples in (8). Each of the non-restrictive relatives makes an assertion (that Mary gave John a present, that

John had never met Mary before, that spring had just begun in Madrid at the time they met). Moreover, each of them establishes co-reference between the relativized and the modified argument (between the giver of the present and Mary, between John and the invitee, between Madrid and the place where the spring had just begun).

- (8) a. John met Mary, who gave him a present.
- b. Mary, whom John had never met before, invited him for dinner.
- c. They met in Madrid, where spring had just begun.

Non-restrictive situation-relatives thus have their own speech act predicates and establish co-reference between their topic situation (which is their relativization site) and that of the matrix clause (which they modify). Applied to the examples in (7), it is asserted that John had no deadline, and that in that same situation John stayed late, that Mary was not hungry and that in the same situation she ate, and that the female person is young and that in the same situation she is not impatient.

Non-restrictive relatives also require their modificandum to be definite or at least referentially specific. Consider the examples in (9) where the matrix clauses in isolation are ambiguous between a specific and a non-specific indefinite reading of the modified nominal expression. Once the non-restrictive relative is included, the non-specific interpretation is lost.

- (9) a. John wants to marry a doctor, who, by the way, recently appeared on TV.
- b. Mary thought about giving John a book, which, by the way, she had started reading the day before.
- c. Mary imagined travelling to a place, where, by the way, her friends had spent the last spring.

For non-restrictive situation-relatives such as concessive clauses, this means that the topic situation is definite or specific. In the default case, definite reference of the topic situation argument is to the actual situation.

To summarize, concessive clauses presuppose the relevant implication and assert that its result obtains in the actual situation while its antecedent does not. The implicature of exhaustive relevance does not necessarily obtain.

This analysis predicts that the relevant implication passes the tests of presupposition in concessive clauses, but not in conditionals and counterfactuals. The

examples in (10) confirm this. Negating a sentence with a conditional or counterfactual also negates the implication, since it is asserted. These are the interpretations that obtain for (10a) and (10b): John having a deadline *does not* imply that he stays late. In (10c), the implication survives: it is maintained that John having a deadline implies John staying late, however, it is not the case that in the actual situation he had no deadline and still stayed late.

- (10) a. It's not the case that if John has a deadline, he stays late.
b. It's not the case that if John had a deadline, he would have stayed late.
c. It's not the case that even though John has no deadline, he stays late.

The same outcome is rendered by the 'Hey, wait a minute!' test (Fintel2004):

- (11) a. A: If John has a deadline, he will watch Game of Thrones.
B: # Hey, wait a minute, I didn't know that having a deadline implies watching a series.
b. A: If John had a deadline, he would have watched Game of Thrones.
B: # Hey, wait a minute, I didn't know that having a deadline implies watching a series.
c. A: Even though John has no deadline, he watches Game of Thrones.
B: Hey, wait a minute, I didn't know that having a deadline implies watching a series.

A further prediction of the present analysis is that, since the subordinate clause is asserted, the hierarchical structure does not contribute to the meaning of concession. The interpretation emerges from the interaction between the presupposed implication and its antecedent being negated in the subordinate clause. This can be tested by coordinate structures: When they fulfill the pragmatic conditions specified in the analysis they should render the concessive interpretation, otherwise not.

Consider the examples in (11). The first sentence involves a commonsense presupposition that having a deadline implies staying late, and asserts that its result holds, and that the antecedent does not. As expected, the meaning of concession obtains. The example in (11b) cannot be matched with a salient presupposition, unless one is accommodated (that not having a new bag implies staying late). In the absence of the presupposition, the meaning of concession does not obtain.

Example (11c) involves the same presupposition as (11a), but asserts rather than negates its antecedent. The meaning of concession fails to obtain (unless the inverse presupposition is accommodated that not having a deadline implies staying late). This is all as predicted by the analysis.²

- (11) a. John has no deadline and he (still) stays late.
- b. John has a new bag and he (still) stays late.
- c. John has a deadline and he (#still) stays late.

Since conditionals and counterfactuals involve restrictive relatives, which in turn must be derived through hierarchical structures, this view predicts that the respective interpretations cannot be achieved by the coordination strategy. This prediction is confirmed too, as shown in (12), where neither the conditional nor the counterfactual interpretation can be attested.

- (12) a. John has a deadline and he stays late.
- b. John { had / would have / would have had } a deadline and he would have stayed late.

2.4 Causal clauses

Causal clauses too are non-restrictive relatives and introduce the relevant implication by presupposition (in (13), John having a deadline implies him staying late, Mary having a serious injury implies her quitting professional sport, us being tired implies us going straight home). Similarities extend to the matrix clause being asserted for the actual situation. The only two differences are that the subordinate clause asserts that the antecedent of the implication obtains in the actual situation and that the implicature of exhaustive relevance is necessary: the only relevant antecedent for the specified result in the given context is the one that figures in the presupposed implication. The implicature of exhaustive relevance

²In (11c), assuming the presupposition of the relevant implication, the meaning of cause obtains, which is also predicted by the present analysis – to the extent that the implicature of exhaustive relevance of the antecedent is triggered.

Note also that speakers prefer to use a particle that marks domain-widening (*still*, as in the examples or *yet*, *anyway*, etc.), yet they accept the sentences also without one if the right intonation is employed. The tendency to insert a particle plausibly comes from the fact that concession is a marked relation compared to causation. Take a neutral conjunction: *John loves Mary and she is nervous*. Even though world knowledge does not favor the interpretation where loving causes being nervous to being nervous acting as an obstacle for loving, the causal interpretation is more likely than the concessive interpretation.

probably emerges from the fact that among other possible implications in which the matrix clause proposition figures as the result, exactly the respective one is selected to be targeted by the subordinate clause and linked with the assertion of the result in the matrix clause.

- (13) a. John stayed late because he had a deadline.
b. Mary quit basketball because she got a serious injury.
c. Since we were tired, we went straight home.

In summary, on the background of the presupposition of the relevant implication, causal clauses assert that the antecedent obtains in the actual situation in which the antecedent is also asserted to obtain. An implicature emerges that the antecedent of the presupposed implication is the only relevant antecedent for the given result. This derives what is intuitively recognized as the meaning of cause.³

In causal clauses too the implication passes the tests of presupposition. In all the examples in (14) the relevant implications project: that John having a deadline implies him staying late, that Mary getting seriously injured implies her quitting basketball, and that us being tired implies us going straight home.

- (14) a. It's not the case that John stayed late because he had a deadline.
b. It's not the case that Mary quit basketball because she received a serious injury.
c. It's not the case that since we were tired, we went straight home.

The same outcome is rendered by the 'Hey, wait a minute!' test:

- (15) a. A: John watched a series because he had a deadline.
B: Hey, wait a minute, I didn't know that you watch a series if you have a deadline.
b. A: Mary quit basketball because she received a serious injury.
B: Hey, wait a minute, I didn't know that you quit basketball if you get seriously injured.
c. A: Since we were tired, we went straight home.
B: Hey, wait a minute, I didn't know that if you're tired you cannot still visit a couple more bars.

³I would even go so far as to argue that the linguistic notion of cause amounts to nothing more than the antecedent of the relevant implication in which the effect figures as the result.

Again, the prediction of the present analysis on which the subordinate clause is asserted is that the hierarchical structure does not play a role in the derivation of the interpretation intuitively identified as causality. Rather, it is derived from the presupposed implication, the fact that both its antecedent and result are asserted for the actual situation, and the implicature of exhaustive relevance of the antecedent for the result. This can be tested by coordinate structures: as far as they fulfill the conditions above they should, and otherwise they should not render the causality interpretation.

In (15a), the semantics is as in the proposed analysis of causal clauses: there is a commonsense implication that having a deadline implies staying late, and the antecedent is at least plausibly the only relevant one in the discourse. As predicted, as long as the two sentences assert for the same topic situation, the interpretation of cause obtains. In (15b) all is the same, except that there is no reason to presuppose the relevant implication (that having a new bag implies staying late, especially not as the only relevant antecedent in the discourse). As predicted, the interpretation of cause does not obtain, unless we accommodate the relevant presupposition. In (15c), the antecedent of the relevant presupposed implication is negated and the causal interpretation does not obtain. Unless the presupposition is accommodated that not having a deadline implies staying late, a concessive interpretation tends to be established (with an oppositive relation between the conjoined clauses).

- (15) a. John has a deadline and he stays late.
 b. John has a new bag and he stays late.
 c. John has no deadline and he stays late.

2.5 Purpose clauses

Purpose clauses are similar to concessive and causal clauses in being non-restrictive and presupposing the relevant implication, to causal clauses additionally in having the implicature of exhaustive relevance for the antecedent, and to conditionals and counterfactuals in not making an independent assertion that the antecedent is or is not true in the actual situation. This seems to contradict the analysis which argues that non-restrictive situation-relatives all make an assertion about the actual situation. I argue that they indeed do, but their assertion is modal in a specific way relative to the actual situation rather than pertaining to the truth or falsity of the antecedent in the actual situation.

This modal nature of the material under assertion comes from the fact that the antecedent of the relevant implication in purpose clauses involves a described

situation which lies in the future relative to the assertion time. Hence it cannot be epistemically evaluated as true or false at the assertion time, but only modally – as (im)possible or (not) obligatory. In the particular case, I argue that the modality of possibility is relevant. Let me provide more details.

In descriptive terms, in (16), the respective presupposed implications with futurate antecedents are: possibly developing in the future into a meeting-the-deadline situation implies staying late at the assertion time, possibly developing in the future into a saving-the-planet situation implies people turning vegan at the assertion time, and possibly developing in the future into an arriving-home-on-time situation implies leaving early at the assertion time.

- (16) a. John stayed late in order to meet the deadline.
 b. Mary turned vegan to save the planet.
 c. I left five minutes early so that I could be home on time.

In more formal terms, a purpose clause in the default case describes a situation which is part of the topic situation, but maps onto a temporal interval that lies after the assertion time. Assertion times imply Belnap2001's (Belnap2001) internal temporal perspective where the topic situation is viewed from the perspective of one temporal point or interval: that of the assertion. In this perspective, at the assertion time to the right on the temporal line, the situation branches into an infinite number of futures, each of which has a status of its possible continuation at the assertion time. Hence, the described situation of the purpose clause cannot be epistemically evaluated at the assertion time as true or false. It can only be asserted as possible (if it matches some branches), impossible (if it matches none), obligatory (if it matches all), or not obligatory (if there are some that it does not match). In the particular case, possibility is the asserted modality.

Let t be the time of the described situation in the subordinate clause and let the described situation be part of the topic situation. At t , there are infinitely many situations which are potential continuations of the topic situation and hence its possible parts. It cannot be determined which of them should be treated as the (actual continuation of the) actual situation at time t . The proposition in the subordinate clause is thus asserted in a disjunctive way for the situations into which the topic situation branches at the assertion time. In other words, it is asserted that the proposition is true in some situations into which the actual situation branches.

Purpose clauses then assert that the matrix clause is true in the actual world and that the subordinate clause is true in some situations into which the actual situation branches at the assertion time. This is interpreted on the background of

a presupposed implication that such branch-situations imply the proposition in the matrix clause. Purpose clauses are thus equivalent to causal clauses, except that the antecedent and the subordinate clause relate to a future possibility rather than to an actual fact.

Typically, matrix clauses modified by purpose clauses involve an intentional agent with control over the described situation. When a controlled action is implied by the possibility of a future situation, a semantic component of desirability of the future situations emerges for the agent as the attitude-holder.

In the examples in (17), this implicature is cancelled by the world knowledge that none of the antecedents are actually desirable. This confirms that the desirability component (which is essential for the notion of purpose) is a matter of implicature. It still crucially obtains that the future discovering-situations are branches of the laser-situation, that the future return-unused-situations are branches of the taking-situation, and that the future separation-situations are branches of the fleeing-situation.

- (17) a. They used lasers against the aliens only to discover that they feed on laser-beams.
- b. She took three tickets only to return them unused five days later.
- c. A family fled death threats only to face separation at the border.

Tests confirm that the implication is presupposed. In each of the sentences in (18) the implication still obtains that the possibility of meeting the deadline in the future implies staying late, the possibility of saving the earth implies turning vegan, and the possibility of coming home on time implies leaving early. In the default broad focus reading, what is negated is the assertion of the matrix clause (John did not stay late, Mary did not turn vegan, the speaker did not leave five minutes early).

- (18) a. It is not the case that John stayed late in order to meet the deadline.
- b. It is not the case that Mary turned vegan to save the planet.
- c. It is not the case that I left five minutes early so that I could be home on time.

A reading is possible for the sentences in (18) where what is negated is the attitude of desirability, in which case the prototypical purpose interpretation does not obtain. Crucially, however, the implications still have to project in the same way as they obtain in the type of examples in (17) (because once desirability is negated, they join this type).

Confirmation also comes from the ‘Hey, wait a minute!’ test:

- (19) a. A: John stayed late in order to meet the deadline.
B: Hey, wait a minute, I didn’t know that you need to stay late if you are to meet the deadline.
- b. A: Mary turned vegan to save the planet.
B: Hey, wait a minute, I didn’t know that if the planet is to be saved, we need to turn vegan.
- c. A: I left 40 minutes early so that I could be home on time.
B: Hey, wait a minute, I didn’t know that if you were to be home on time, you needed to leave 40 minutes earlier.

Finally, it can also be shown that a purpose clause is indeed only about the possibility of a future situation and not its certain occurrence. Consider the examples in (19) where the continuation in each of them confirms that it is possible to use a purpose clause even in case the actual situation turned out to involve a branch in which the subordinate clause is false.

- (19) a. John stayed late in order to meet the deadline. But it turned out that even that was not enough.
- b. Mary turned vegan to save the planet. But it seems that the course of events cannot be changed any more.
- c. I left five minutes early so that I could be home on time. But then I met you guys and here I am at 5 a.m., drinking beer in the park.

For questions and imperatives, the analysis predicts that the restrictive situation-relatives restrict the speech act, rather than the speech act simply applying to the entire sentence. The data confirm this and reveal an asymmetry between questions and imperatives. Consider the examples in (20).

- (20) a. John has a deadline, let him stay late!
- b. If John has a deadline, does he stay late?
- c. ? Let John stay late if he has a deadline!
- d. Does he stay late if he has a deadline?

Examples (20a) and (20b) fully fit the analysis. Their meaning may indeed be paraphrased as: for the topic situations in which John has a deadline, (i) I order him to stay late, i.e., (ii) I ask whether he stays late. The example in (20c) is degraded

without an intonation break, yet to the extent that it is acceptable, its interpretation is equivalent to that of (20a). However, the example in (20d) seems to have an additional interpretation which is somewhat different than in (20b). Taking a deeper look, however, the difference is along two dimensions which do not violate the applicability of the analysis. One is the information-structural status of the subordinate clause: Is it topical or backgrounded/focal? The other is the possibility that the yes-no question applies not to a structure without a speech act (i.e., to the described situation of the matrix clause), but that the question projects over the assertion (paraphrasable as: do you assert, i.e., do you commit to the implication ‘John stays late if he has a deadline’). Imperatives do not seem to have the option to apply to a speech act unless it is overtly expressed. The analysis proposed nevertheless applies in all these cases.

The situation is much more complex in this regard with non-restrictive situation-relatives and I leave it for further research.

Table 2 summarizes the relevant properties of the five clause types (✓ marks that the clause type does, and ✗ that it does not manifest the respective property, i.e., that it does not contribute any relevant specification).

Table 2: The relevant properties of the five clause types

	restrictivity	implication	antecedent	actual situation	exhaustive relevance
Cond.	restrictive	asserted	✗	✗	✗
Cntfct.	restrictive	asserted	✗	excluded	✗
Causal	non-restrictive	presup.	asserted	targeted	✓
Conces.	non-restrictive	presup.	negated	targeted	✗
Purpose	non-restrictive	presup.	possible	targeted	✓

3 Serbo-Croatian situation-relatives

The model presented in §2 predicts that the five properties it is based on (see Table 2) will have overt morphological and syntactic correlates at least in some languages. In this section, I show how this prediction is confirmed in Serbo-Croatian.

Serbo-Croatian (SC) has a rich inventory of subjunctions and verb forms. It has highly morphologically transparent subjunctions with neat restrictions on

the use of a correlative pronoun. It also has subjunctively as well as indicatively marked subjunctives, and the subjunctive-indicative opposition may additionally be marked on the verb.⁴ The availability of two positions for the marking of subjunctivity provides a fine instrument for the testing of the status regarding the actual situation. With six tense forms and four modal verb forms (including the morphological present of perfective verbs), SC also provides a rich inventory of handles for expressing the fine nuances of tense and modal semantics. This makes it a very convenient testing ground for the proposed model. I will first discuss the verb forms associated with the five subordinate clause types in SC (§3.1) and then turn to the corresponding subjunctives (§3.2).

3.1 Verb forms

Along the dimension of meanings sensitive to the indicative-subjunctive divide, two of the five clause types have a special status: the matrix clauses of a counterfactual and the purpose clauses. The former is an assertion indirectly restricted to exclude the actual situation (i.e., by the presupposition of the subordinate clause combining with the co-reference between the two topic situations). In other words, it is epistemically evaluated in situations other than the actual situation, but it is not unequivocally epistemically evaluated in the actual situation. The latter is modal: it asserts that there are situations satisfying the expressed proposition in the set of branches of the actual situation at the assertion time. Both these effects involve what is often descriptively referred to as irrealis meanings (Chung:1985) and are therefore expected to trigger subjunctive/modal marking (it is hard to draw a line between modal and subjunctive verb forms in SC and I hence refer to all of them as subjunctive).

Indeed, exactly these two clause types – and only they – require subjunctively marked verbs: purpose clauses in the subordinate clause and counterfactuals in the main clause. While purpose clauses tolerate not only the strongest subjunctive marking (the verb form usually labeled “conditional”), but also a weaker subjunctive marking (the present tense of a perfective verb), as illustrated in (21a) contrasted with (21b) with non-subjunctive forms, in counterfactuals the matrix clause only allows for a verb in the conditional, as shown in (21c), with non-subjunctives also being ungrammatical; see (21d).

⁴Here I use the term SUBJUNCTIVE only descriptively to refer to particular verb forms or subjunctives labeled in the grammatical description as subjunctive. I remain agnostic as to the exact semantics of this class of items, except for the rough observation that it has to do with the irrealis, non-veridical meanings, i.e., broadly speaking meanings which are not direct properties of the actual situation.

- (21) a. *Polomio je staklo da {uskoči / bi uskočio} u sobu.*
 broken AUX glass DA jump.PFV.PRS AUX.SBJV jumped in room
 ‘He broke the glass in order to jump into the room.’
- b. **Polomio je staklo da {će uskočiti / je uskočio} u sobu.*
 broken AUX glass DA AUX.FUT jump AUX.PRF jumped in room
- c. *{Polomio bi / *polomi} staklo da je uskočio u sobu.*
 broken AUX.SBJV break.PRF.PRS glass DA AUX jumped in room
 ‘He would have broken the glass if he had jumped into the room.’
- d. **{Polomiće / polomio je} staklo da je uskočio u sobu.*
 break.FUT broken AUX glass DA AUX jumped in room

The matrix clause of a purpose clause undergoes no restrictions regarding the verb form: any verb form can be used. Several illustrations are given in the variations on (21b) in (22).

- (22) a. *Lomi staklo da bi uskočio u sobu.*
 breaks glass DA AUX.SBJV jumped in room
 ‘He’s breaking the glass in order to jump into the room.’
- b. *Lomiće staklo da bi uskočio u sobu.*
 break.FUT glass DA AUX.SBJV jumped in room
 ‘He’ll break the glass in order to jump into the room.’
- c. *Lomio je staklo da bi uskočio u sobu.*
 broken AUX glass DA AUX.SBJV jumped in room
 ‘He broke the glass in order to jump into the room.’

It is even possible to have the verb in the matrix clause in the conditional, in which case the subjunctive interpretation, normally hypothetical or optative, obtains for the entire complex sentence, as in (23).⁵

- (23) *Lomio bi staklo da bi uskočio u sobu.*
 broken AUX.SBJV glass DA AUX.SBJV jumped in room
 ‘He would break the glass in order to jump into the room.’

Examples in (21c)–(21d) and in (24) illustrate the ban on any other form than the conditional in the matrix clause of a counterfactual.

⁵I ignore here the habitual interpretation of the matrix clause, which is a different type of use of the conditional.

- (24) a. *Da je jakna suva, obukao bih je.*
 DA is jacket dry worn AUX.SBJV.1SG her
 ‘If the jacket were dry, I would have worn it.’
 b. **Da je jakna suva, {obukao sam / obučem je.}*
 DA is jacket dry worn AUX.PRF.1SG wear.PRS.1SG her
 Intended: ‘If the jacket were dry, I would {would have worn/wear} it.’

Inversely to the purpose clauses where the matrix clause can have any verb form and the subordinate clause is restricted to subjunctive verb forms, an inverse picture is obtained with counterfactuals. The subordinate clause of this type can have any verb form except for the conditional. Moreover, as discussed in §3.2, both counterfactuals and purpose clauses are introduced by the subjunctive subjunction *da*. Hence they share the subjunction and they both involve a restriction to subjunctive verb forms – only differently distributed (for purpose clauses to the subordinate, and for counterfactuals to the matrix clause).

A plausible analysis is that the conditional marking on the verb is related to the subjunctive subjunction in the subordinate clause in both clause types, and that in both clause types the subjunction somehow binds the closest verb targeted by a speech act. As purpose clauses are non-restrictive relatives with their own assertion, in their case it is the verb in the subordinate clause that is targeted. Counterfactuals are restrictive relatives without their own assertion – they restrict the assertion of the matrix clause, and therefore the subjunction binds the conditional on the matrix verb. Note that as shown in (25b), the use of the conditional in the subordinate clause (too) yields a purpose clause.⁶

- (25) a. *Da je jakna bila suva, obukao bih je.*
 DA AUX.PRF jacket been dry worn AUX.SBJV.1SG her
 ‘If the jacket had been dry, I would have worn it.’

⁶The unavailability of the conditional in counterfactuals cannot be explained as an elsewhere effect because other similar situations show that subordinate clauses ambiguous between two or more readings are quite regular in SC. For completeness, let me also point out that the three types of situation-relatives which allow for indicative verb forms both in the subordinate and in the matrix clause – conditional, concessive, and causal clauses – can in principle also involve a verb in the conditional. However, when they do, either the conditional imposes an optative/desiderative interpretation or the verb in the matrix clause needs to be in the conditional, too (i.e., the entire sentence must be in a context that licenses it). Consider the examples in (i) (the judgments are given excluding the optative interpretation).

- (i) a. *Ako {bi / *je} jakna bila suva, mogao bih da je obučem.*
 if AUX.SBJV PRF jacket been dry could AUX.SBJV.1SG DA her put.on
 ‘If the jacket were dry, I could put it on.’
 b. *I-ako {bi / *je} jakna bila suva, ne bih je obukao.*
 and-if AUX.SBJV PRF jacket been dry not AUX.SBJV.1SG her put.on
 ‘Although the jacket would be dry, I wouldn’t put it on.’

- b. # *Da bi jakna bila suva, obukao bih je.*
 DA AUX.SBJV jacket been dry worn AUX.SBJV.1SG her
 only: ‘In order for the jacket to be dry, I would wear it.’

Moreover, if the property which distinguishes purpose clauses from the other four clause types is the futurate time of the described situation and of the antecedent of the relevant implication, it is predicted that the other four types of subordinate clauses can only denote situations which occur before or simultaneously with the assertion time. The relevant question is thus what happens when the verb in the subordinate clause is in the future tense.

In the remaining four clause types, as expected, when the verb in the subordinate clause is in the future, the described situation itself cannot be subject to epistemic evaluation at the assertion time. In order to resolve the conflict between the future tense on the embedded verb and the constraint that the described situation must be epistemically evaluated at the assertion time, a coercion takes place. The only available interpretation in such cases is the reading where the antecedent of the relevant implication is not the future (non-)occurrence of the described situation, but rather the commitment, in the sense of Krifka2015, of the interlocutors to its (non-)occurrence (related to what has been referred to as the high construct reading).

In the example in (26), the subordinate clause expresses that the antecedent in the implication is the commitment of the interlocutors that the jacket will be dry, not its dryness (specified to occur in the future). Everything else stays the same: as expected for a counterfactual, it presupposes that the interlocutors are not committed to the dryness of the jacket at the relevant future time in the actual world.

- (26) *Da će jakna biti suva, pa da je obučem.*
 DA AUX.FUT jacket be dry so DA her put.on
 ‘If the jacket were going to be dry, I would have put it on.’
 a. ‘... Though, who knows, maybe it will be.’
 b. # ‘... Though we all actually believe that it will be.’

As shown in the example, the sentence can be followed by an assertion that the jacket may still happen to become dry at some relevant future time. Only the commitment matters: the interlocutors must not believe that it will, and a continuation suggesting that they are is out. The same effect of the use of the future

c. *Za-to što {bi / *je} jakna bila suva, ja bih je obukao.*
 for-that ŠTO AUX.SBJV PRF jacket been dry I AUX.SBJV.1SG her put.on
 ‘I would put the jacket on, because it would be dry.’

tense obtains in the remaining three classes of situation-relatives in which the described situation is not in the future: regular conditionals, concessives, and causal clauses, as illustrated in (27). In all three examples, it is the commitment and not the described future situation that is interpreted as the condition, i.e., the cause.

- (27) a. *Ako će jakna za jedan sat biti suva, mogu odmah da je obučem.*
 if AUX.FUT jacket in one hour be dry can.1SG immediately DA
 her put.on
 ‘If the jacket will be dry in an hour, I can put it on now.’
- b. *I-ako će jakna za jedan sat biti suva, neću odmah da je obučem.*
 and-if AUX.FUT jacket in one hour be dry NEG.AUX.FUT.1SG
 immediately DA her put.on
 ‘Although the jacket will be dry in an hour, I won’t put it on now.’
- c. *Za-to što će jakna za jedan sat biti suva, mogu odmah da je obučem.*
 for-that ŠTO AUX.FUT jacket in one hour be dry can.1SG
 immediately DA her put.on
 ‘I can put the jacket on now because it will be dry in an hour.’

This confirms the proposed analysis. It can be generalized that whenever the proposition expressed cannot be evaluated at the epistemic evaluation time and for the topic situation, subjunctive marking occurs on the verb. In other words, the impossibility of epistemic evaluation which has been postulated as a relevant property in the analysis receives systematic overt morphosyntactic marking.

3.2 The subjunctions

Unmarked conditional clauses involve the subjunction *ako*, which has been analyzed as a plain situation-relative pronoun (Arsenijevic2009b), unmarked for subjunctivity or factivity. Etymologically, it is a wh-pronoun, originally with the meaning of English *how* which has shifted from this broader meaning to being reserved for conditionals.⁷

Conditional clauses can also be introduced by a morphologically complex item *ukoliko*, derived from a PP *u koliko* ‘in how much’. This item points to a possible

⁷But observe that the etymologically related wh-item *kako* ‘how’ is still also used for a clause type which is between conditionals and causal clauses introducing factive situation-relatives, as in (i).

scalar nature of the relativized argument: a salient analysis would involve an abstraction over the degree of truth.⁸ This implies an analysis where situations are mapped onto a scale and the subordinate clause is a predicate over the degrees on this scale, taking as its argument the degree onto which the matrix clause maps. Note that in spite of the availability of the gradable adjective *toplo* ‘warm’, the subjunction does not relate to the degree of temperature in any way, but only to the degree to which it is true that it is warm.

- (28) a. *Ako je toplo, plivaćemo u reci.*
 AKO is warm swim.FUT.1PL in river
 ‘If it is warm, we will swim in the river.’
 b. *Ukoliko je toplo, plivaćemo u reci.*
 in.as.much is warm swim.FUT.1PL in river
 ‘If it is warm, we will swim in the river.’

That all the subjunctions introducing conditional clauses involve wh-items, as will be shown for situation-relatives in the rest of this section, and as discussed more generally in Arsenijevic2006, is another confirmation of the relativization analysis.

Concessives are typically introduced by the morphologically complex subjunction *iako*, derived from the unmarked conditional subjunction *ako* ‘if’ discussed above and the conjunction *i* ‘and’. The SC conjunction *i* ‘and’, however, receives a range of different interpretations in different contexts (Arsenijevic2011): the plain conjunctive reading, as in (29a), the emphatic conjunctive reading (a focal presupposition triggering item, the counterpart of the English *too*), as in (29b), as well as a polarity sensitive reading where it widens the reference domain (Chierchia2006), as in (29c).

- (29) a. *Jovan i Marija pevaju.*
 Jovan and Maria sing
 ‘Jovan and Marija are singing.’
 b. *Gledali ste i taj film.*
 seen AUX.2PL and that movie
 ‘You saw that movie, too.’

-
- (i) *Kako je jakna bila suva, mogao sam da je obučem.*
 how AUX.PRF jacket been dry could AUX.PRF.1SG DA her put.on
 ‘Since the jacket was dry, I could put it on.’

⁸This does not necessarily imply fuzzy logic, since the scale may as well be a trivial discrete two-degree scale with false and true as its only degrees.

- c. *Da li si video i-koga?*
 da Q AUX.2SG seen and-whom
 ‘Have you seen anyone?’

I have argued in §2 that, in concessive clauses, the subordinate clause negates the antecedent of a presupposed implication, while the main clause expresses that its result holds, both with respect to the same topic situation. The antecedent and its negation can be mapped onto a scale of likeliness that the result is true. All else being equal, the antecedent maps onto the highest degree of likeliness and its negation then stands for the degree of the least likeliness. The fact that *i* ‘and’ morphologically and prosodically forms a unit with *ako* ‘if’ indeed points in the direction of its polar-sensitive use (only in this use, *i* ‘and’ forms a phonological word with the item it operates on).

This yields a neat match. Consider the example in (30a). Here the subjunction *iako* ‘although’ can be seen as an item that expands the domain of swimming situations by the least likely kind: by the cold-weather situations, in the same way that *i-koga* ‘anyone’ in (29c) expands the domain of the seen individuals with the ones least expected to be seen.

- (30) a. *Iako je hladno, plivaćemo u reci.*
 and.if is cold swim.FUT.1PL in river
 ‘Although it is cold, we will swim in the river.’
 b. *Uprkos tome što je hladno, plivaćemo u reci.*
 inspite it ŠTO is cold swim.FUT.1PL in river
 ‘Although it is cold, we will swim in the river.’
 c. *Mada je hladno, plivaćemo u reci.*
 even.DA is cold swim.FUT.1PL in river
 ‘Although it is cold, we will swim in the river.’

The option illustrated in (30b) involves a preposition with overtly concessive (even oppositive) semantics (*uprkos*), a correlative pronoun (*to-me*), and the item *što* which I discuss below with respect to causal clauses (for an extensive discussion of correlative pronouns, see Zimmermann2021 [this volume]).

As illustrated in (30c), there is one more concessive subjunction, synonymous with *iako*, which is also morphologically complex and derives from the item *ma*, the shortened version of *makar* ‘even’, another domain-widening / free-choice particle (see (31)), and the subjunctive subjunction *DA*.

- (31) a. *Poješću ga makar me ubilo.*
 eat.FUT.1SG it MAKAR me killed
 ‘I’ll eat it even if it killed me.’
 b. *Ni-je ona makar ko.*
 NEG-is she MAKAR who
 ‘She isn’t just anyone.’

While the involvement of the domain-widening particle is fully in line with the proposed analysis, the use of the subjunctive *DA* poses a question considering that concessive clauses are analyzed as asserted for the actual situation. Even though assertion about the actual situation is not incompatible with *DA* in SC, see (32), its occurrence in this context does not fully fit in the mapping between subjunctives and the semantics of situation-relatives argued for in the present paper. I leave this issue for further research.

- (32) *Sećam se da si dolazio.*
 remember.1SG REFL DA AUX.2SG come
 ‘I remember that you came.’

The subjunctive item *DA* is used in SC to introduce subjunctive clauses, as shown by Topolinska1992 and Miseska-Tomic2004. Apart from being composed into the above mentioned concessive subjunction *mada*, it is also used on its own to introduce situation-relatives. Only two of the five types of situation-relatives can be introduced by a bare *DA*: counterfactuals, as in (33a) and purpose clauses, as in (33b): exactly those that were discussed regarding the use of the conditional, i.e., those which do not target the actual situation at the assertion time. As hinted there, it is likely that the subjunction *DA* in both these cases combines with a verb in the conditional to mark this epistemic status: with the one in the subordinate clause in the non-restrictive concessives, where the subordinate clause has its own speech act, and with the one in the matrix clause of the restrictive counterfactuals, where the subordinate clause restricts the speech act of the matrix clause. This view is supported by the fact that neither a bare *DA* nor the locally licensed conditional occur in any other clause type.

- (33) a. *Da je bilo toplije, plivali bismo u reci.*
 DA AUX been warmer swum AUX.SBJV.1PL in river
 ‘Had it been warmer, we would have swum in the river.’
 b. *Ostali smo da bismo se odmorili.*
 stayed.PL AUX.1PL DA AUX.SBJV.1PL REFL had.rest
 ‘We stayed in order to have a rest.’

Purpose clauses universally also allow for a longer version of the connecting item, where the DA-clause occurs within a PP headed by the preposition *za* ‘for’ or *zbog* ‘because’ with the default demonstrative *to* as the complement, as in (34).

- (34) a. *Ostali smo za-to da bismo se odmorili.*
 stayed.PL AUX.1PL for-that DA AUX.SBJV.1PL REFL had.rest
 ‘We stayed in order to have rest.’
 b. *Ostali smo zbog toga da bismo se odmorili.*
 stayed.PL AUX.1PL because that DA AUX.SBJV.1PL REFL had.rest
 ‘We stayed in order to have a rest.’

The use of the overt PP extension is often negatively stylistically judged; high registers avoid it unless the purpose component is stressed, but this may also be seen as a question of stylistic deletion or a stage in the grammaticalization of the construction (the combination of DA with the subjunctive verb form).

The possibility to use the longer version establishes a neat minimal pair between the purpose clauses and the causal clauses. Causal clauses are typically introduced by the combination of the same prepositions used to extend the subjunction DA in purpose clauses and the subjunction *što* as illustrated in (35).⁹

- (35) a. *Marija je otišla za-to što je Jovan došao.*
 Maria AUX left for-that ŠTO AUX Jovan arrived
 ‘Marija left because Jovan arrived.’
 b. *Marija je otišla zbog toga što je Jovan došao.*
 Maria AUX left because that ŠTO AUX Jovan arrived
 ‘Marija left because Jovan arrived.’

The SC subjunction *što* ‘what’ has strong factive semantics. It carries the semantics of specific reference, normally marking that the clause which it introduces involves a specific (often familiar) described situation, or alternatively – on a reading similar to high construct interpretations – that the proposition that it expresses is true and familiar in the discourse. Consider (36).

- (36) a. *Sećaš se što je Jovan imao sestru?*
 remember.2SG REFL ŠTO AUX Jovan had sister
 ‘Remember the sister that John had?’
 (or: ‘Remember the well-known fact that John had a sister?’)

⁹One additional preposition is used for the introduction of causal clauses: *po* with primary temporal posterior semantics. As it has no interesting properties (except perhaps confirming the constraints on the temporal relation between the described situation and the assertion time), this expression will not be discussed in the present paper.

- b. *Sećaš se da je Jovan imao sestru?*
 remember.2SG REFL DA AUX Jovan had sister
 ‘Remember that John had a sister?’

The use of *što* in (36a), on the more easily available reading, marks that the described situation is familiar and unique which then infers that the sister is also familiar and unique (i.e., that Jovan has only one sister and that the interlocutors know who she is), even though the nominal expression is the same as in (36b) where the reading is ambiguous with a tendency for the indefinite interpretation. The use of *DA* is hence neutral in this respect, even though in both examples the subordinate clause is clearly factive.

The prepositional component *za-to* ‘for-that’ and *zbog toga* ‘because that’ plausibly has the same contribution both in causal and in purpose clauses. It strengthens the exhaustive relevance of the antecedent. In causal clauses, this effect is even stronger due to the specificity component contributed by *što*.

In causal clauses, similar to purpose clauses, the prepositional component *za-to* ‘for-that’, i.e., *zbog toga* ‘because that’ can be deleted, but in this case it is the version that undergoes deletion that is stylistically negatively marked. In the higher registers it is limited to only certain contexts with a much broader use in lower registers.

- (37) *Marija je otišla što je Jovan došao.*
 Maria AUX left ŠTO AUX Jovan arrived
 ‘Marija left because Jovan arrived.’

The parallel extends further: both purpose and causal clauses answer the same question in SC (and in many other languages). Both answers in (38) are fully salient for the given question. This suggests that what is traditionally described as causal and purpose clauses share at least one common property. Under the present analysis, it is the exhaustive relevance of the antecedent combined with the non-restrictive status of the subordinate clause which expresses it and the affirmative relation between the subordinate clause and the antecedent of the relevant implication. The difference is in fact slight: only the modal nature of the purpose clauses, and it is exactly what we see on the surface, in the choice of the subjunctive subjunction and a subjunctive verb form, as opposed to the specific subjunction and a free choice of verb forms.

- (38) A: *Zašto je Marija otišla?*
 why AUX Maria left
 ‘Why did Marija leave?’

- B: *Marija je otišla (zato) da bi Jovan došao.*
Maria AUX left for.that DA AUX.SBJV Jovan arrived
'Marija left in order for Jovan to arrive.'
- B': *Marija je otišla (zato) što je Jovan došao.*
Maria AUX.PRF left for.that ŠTO AUX Jovan arrived
'Marija left because Jovan arrived.'

It is obvious that the five clause types are not all the possible combinations of the five components the model is based on. They are rather the combinations with the highest functional load. Other combinations can in fact be found, but with a somewhat lower frequency, and consequently a lower prominence in grammatical descriptions. Consider for illustration clauses which instantiate an intermediate stage between conditionals and causal clauses, e.g., those introduced by the temporal wh-item *kad* (*već*) 'when (already)', as in (39).

- (39) *Kad tad nisam umro, nikad neću.*
when then NEG.AUX.1SG died never NEG.AUX.FUT.1SG
'As I haven't died then, I never will.'

Here, the subordinate clause is clearly non-restrictive, yet it is neither marked as definite (*kad* 'when' is used instead of *što*), nor does it strengthen the exhaustive relevance of the antecedent (the preposition *za* is absent). The resulting interpretation is similar to causal clauses but without the flavor of a cause (just like the examples of purpose clauses without the desirability component illustrated in (17) above).

One final prediction concerns the possibility to use a correlative pronoun to introduce the subordinate clause. The model postulates a co-reference between the topic situation of the non-restrictive situation-relative and the topic situation of the matrix clause. The topic situation of the matrix clause is best represented as expressed by a null pronoun (see Vries2002). A plausible candidate for its overt realization is a correlative pronoun. Assuming that this is the case, the prediction is that only non-restrictive situation-relatives may be introduced by an expression which includes a correlative pronoun. I have already shown that concessive, causal, and purpose clauses may involve a correlative pronoun selected by a preposition. I repeat the examples in (40).

- (40) a. *Uprkos tome što je hladno, plivaćemo u reci.*
inspite that ŠTO is cold swim.FUT.1PL in river
'Although it is cold, we will swim in the river.'

- b. *Ostali smo za-to da bismo se odmorili.*
 stayed.PL AUX.1PL for-that DA AUX.SBJV.1PL REFL had.rest
 ‘We stayed in order to rest.’
- c. *Marija je otišla za-to što je Jovan došao.*
 Maria AUX left for-that ŠTO AUX Jovan arrived
 ‘Marija left because Jovan arrived.’

As predicted, there is no possible strategy to introduce conditionals and counterfactuals by expressions which involve a correlative pronoun. Examples in (41) present attempts to derive a counterfactual and a conditional clause with correlative pronouns.

- (41) a. *(*To) da je toplo, plivali bismo u reci.*
 that DA is warm swum AUX.SBJV.1PL in river
 ‘If it were warm, we would have swum in the river.’
- b. **{U-toliko / to} ako je toplo, plivaćemo u reci.*
 in-that.much that AKO is warm swim.FUT.1PL in river
 Intended: ‘If it is warm, we will swim in the river.’

4 Conclusion

A strong hypothesis has been formulated in Arsenijevic2006 that all subordinate clauses are underlyingly relative clauses, i.e., that they are all derived by the general mechanism whereby one argument of the clause is abstracted and the resulting one-place predicate occurs as a modifier of an argument of the respective type in a higher expression. I discussed the empirical plausibility of the implication of this analysis, that five traditional clause types correspond to one and the same type of relative clauses: situation-relatives. I have outlined an analysis where the five classes of subordinate clauses closely match five pragmatically prominent combinations of properties of five relevant components: the restrictive vs. non-restrictive nature of the situation-relative, the presupposed vs. asserted status of the relevant implication, the epistemic status of the antecedent of a presupposed implication as asserted by the subordinate clause, the relation between the proposition in the subordinate clause and the actual situation, and the exhaustive relevance of the antecedent of the implication. Predictions of the analysis regarding the projection of presuppositions, cancelability of implicatures, availability of equivalent coordinated structures, and morphological and/or syntactic marking of the postulated components have been confirmed by data from English and SC.

Abbreviations

1	first person	PL	plural
2	second person	PRS	present
3	third person	PRF	perfect
AUX	auxiliary verb	Q	question particle
COND	conditional	REFL	reflexive marker
FUT	future	SG	singular
M	masculine	SBJV	subjunctive
NEG	negation		

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Chapter 2

Czech binominal *každý* ‘each’

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In this article we describe syntactic and semantic properties of Czech binominal *každý* ‘each’. We focus on the interaction between binominal *každý* with different types of collectives. We explain a surprising compatibility of certain types of collectives with binominal *každý* by a local conception of distributivity and collectivity. The semantic formalization is carried out in the PCDRT framework.

Keywords: binominal *each*, Czech, formal semantics, syntax/semantics interface, PCDRT, pluralities

1 Introduction

In this paper we describe the syntactic and semantic properties of the Czech counterpart of English binominal *each*. We are aware of only sparse formal linguistic work describing Slavic expressions corresponding to English binominal *each*, namely [Przepiórkowski 2014](#) and [Przepiórkowski 2015](#); so we will start our description with some basic observations about the syntax and semantics of this peculiar expression. The first step to approach this task (irrespective of a particular language) is to tease apart binominal ‘each’ from its determiner relative. Both types share the obligatory distributive semantics. Consider example (1), which has – as one of its readings – the so called cumulative interpretation, which would be true, e.g., in a situation where boy₁ bought book₁ and boy₂ bought books₂₊₃). Such an interpretation is lacking with sentences like (2a)/(2b), containing determiner *each* and binominal *each* respectively. Following standard terminology, we label the NP part of the subject in (2a) RESTRICTOR (*two boys*) and the VP part of (2a) NUCLEAR SCOPE (*bought three books*). For binominal *each* the terminology is as follows: *two boys* is the (SORTING) KEY and *three books* is the



(DISTRIBUTIVE) SHARE. The difference in terminology reflects a widely adopted linguistic lore, which describes the semantics of binominal *each* as taking two nominal arguments. In a nutshell, despite the shared semantic core of both types of *each* (distributivity), there is a difference in their syntactic and semantic composition (with the rest of the clause) which in some cases (as we will see) can lead to their different semantic behaviour. Moreover, it is usually assumed that binominal *each* forms a constituent with the object (share) unlike determiner *each*, which forms a constituent with the subject. For completeness, in (2c) we add an example of floating *each*, which attaches to a VP. Floating *each* (called “adverbial *each*” by Safir & Stowell 1988) will only be considered marginally in this paper.

- (1) Two boys have bought three books.
- (2)
 - a. Each [_{PP} of the two boys] has bought three books. DETERMINER *each*
 - b. Two boys have bought [_{NP} three books] each. BINOMINAL *each*
 - c. Two boys have each [_{VP} bought three books]. FLOATING *each*

We proceed as follows. We start with a description of the basic morphosyntactic properties of Czech binominal *každý* ‘each’ (§2), which, as in English and in many other languages, has a homophonous determiner reincarnation. Then, after providing some background on the semantic notions of cumulativity, collectivity, and distributivity (§3), we present the core puzzle, namely the compatibility of binominal *každý* with a certain class of collective nominals in the key (§4). In §5 we introduce the framework in which our analysis is couched – Plural Compositional Discourse Representation Theory (PCDRT). In §6 we offer a PCDRT analysis of binominal *každý* and deal with the puzzle presented in §4. The summary in §7 concludes the paper.

2 Morphosyntactic properties

Czech binominal *každý* ‘each’ generally behaves like its English counterpart (see Safir & Stowell 1988 for seminal discussion and Zimmermann 2002 or Dotlačil 2012 for more recent accounts). Yet, it exhibits some specific properties, which one can attribute to rich inflectional morphology: *každý* is not a particle (as e.g. the German counterpart *je* and possibly the English *each*), but an adjective and as such it is obligatorily marked for case, number, and gender features. We first discuss the baseline properties – those that *každý* shares with *each* (§2.1) – and

then turn to the more specific ones (§2.2). We round up the discussion by a working hypothesis about the syntactic representation of structures with binominal *každý* (§2.3).

2.1 Properties of binominal *každý* shared with binominal *each*

Binominal *každý*, as its English counterpart, can either precede or follow its share, highlighted by bracketing in (3).

- (3) a. *Chlapci koupili každý [dvě čepice].*
 boys.NOM.PL bought.PL each.NOM.SG two caps.ACC.PL
 ‘The boys bought each two caps.’
 b. *Chlapci koupili [dvě čepice] každý.*
 boys.NOM.PL bought.PL two caps.ACC.PL each.NOM.SG
 ‘The boys bought two caps each.’

Binominal *každý* imposes restrictions on the referential/quantificational nature of its share familiar from English (Safir & Stowell 1988: 428). Most naturally, the share is modified by a numeral. Bare NP shares (underspecified for definiteness) or shares modified by other determiners, such as demonstratives, are not fully acceptable; see (4). The contrast to (5) demonstrates that this property distinguishes binominal *každý* from floating *každý*.

- (4) a. *Chlapci koupili každý [[jednu / ?Ø / ?tu] čepici].*
 boys.NOM.PL bought.PL each.NOM.SG one that cap.ACC
 Intended: ‘Each boy bought one / a/the / that cap.’
 b. *Chlapci koupili [[jednu / ?Ø / ?tu] čepici] každý.*
 boys.NOM.PL bought.PL one that cap.ACC each.NOM.SG
 Intended: ‘Each boy bought one / a/the / that cap.’

- (5) *Chlapci každý [koupili {jednu / Ø / tu} čepici].*
 boys.NOM.PL each.NOM.SG bought.PL one that cap.ACC
 ‘The boys each bought one / a/the / that cap.’

The relation between binominal *každý* and its key is restricted by locality: they must be clausemates. This condition is satisfied in (6a), but not in (6b). Example (6c) demonstrates that infinitivals also count as “clauses”.

- (6) a. *Chlapci koupili Marii každý jednu čepici.*
 boys.NOM.PL bought Marie.DAT each.NOM.SG one cap.ACC
 ‘The boys bought Mary one cap each.’
- b. * *Chlapci říkali, že Marie koupila každý jednu čepici.*
 boys.NOM.PL said that Marie bought each.SG.M one cap.ACC
 Intended: ‘Each of the boys said that Mary bought one cap.’
- c. * *Chlapci přiměli Marii koupit každý jednu čepici.*
 boys.NOM.PL persuaded Marie.ACC buy.INF each.NOM.SG one cap.ACC
 Intended: ‘Each of the boys persuaded Marie to buy one cap.’

2.2 Properties specific to *každý*

Czech binominal *každý*, just like its determiner and floating relatives, can be combined with the distributive preposition *po*; see (7). The preposition *po* and its interaction with the various uses of *každý* ‘each’ is not discussed in this paper.¹

- (7) a. *Každý z chlapců si vzal po jablíčku.* DET *každý*
 each.NOM.SG.M of boys.GEN REFL took.SG PO apple.LOC
 ‘Each of the boys has taken an apple.’
- b. *Chlapci si každý vzali po jablíčku.* FLOATING *každý*
 boys.NOM REFL each.NOM.SG took.PL PO apple.LOC
 ‘The boys have each taken an apple.’
- c. *Chlapci si vzali každý po jablíčku.* BINOMINAL *každý*
 boys.NOM REFL took.PL each.NOM.SG PO apple.LOC
 ‘The boys have taken an apple each.’

The grammatical role of the key and the share is not restricted in Czech, arguably owing to rich inflectional morphology. The key can be a subject (as shown above), as well as direct (accusative) or indirect (dative) object; see (8). The binominal *každý* agrees with the key in case and gender (but not number; see discussion associated with (11)). Example (9) further demonstrates that the key must precede the share, at least in what appears to be their A-positions; an A'-fronted

¹We are not aware of a discussion of the Czech distributive preposition *po* (for some discussion of the related distributive prefix *po-* in Czech, see Biskup 2017). Relevant literature exists on Russian (Pesetsky 1982; Harves 2003; Kuznetsova 2005) or Polish (Przepiórkowski 2008; 2013).

share, illustrated in (9b), can precede the key. Example (9b) demonstrates yet another important property, namely that the binominal *každý* fronts together with the share, suggesting that they form a constituent (see also Safir & Stowell 1988: 437).²

- (8) a. *Představil své kolegy každého jedné kamarádce.*
introduced his colleagues.ACC each.ACC.SG one friend.DAT
‘He introduced his colleagues to one friend each.’
b. *Představil svým kolegům každému jednu kamarádku.*
introduced his colleagues.DAT each.DAT.SG one friend.ACC
‘He introduced one friend to each of his colleagues.’
- (9) a. **Představil každého jedné kamarádce své kolegy.*
introduced each.ACC.SG one friend.DAT his colleagues.ACC
Intended: ‘He introduced his colleagues to one friend each.’
b. *Každého jedné kamarádce představil (jen) své kolegy.*
each.ACC.SG one friend.DAT introduced only his colleagues.ACC
‘He introduced (only) his colleagues to one friend each.’

As in English, the share in Czech can be a direct or indirect object (as illustrated in (8)), as well as an adjunct (not illustrated here), but unlike in English (Safir & Stowell 1988: 436), it may also be the subject, at least in cases where it follows the key; see (10).³

- (10) a. *Ty chlapce zahlédla každého jedna dívka.*
the boys.ACC spotted.SG.F each.ACC.SG one girl.NOM
‘The boys were spotted by one girl each.’
b. **Každého jedna dívka zahlédla ty chlapce.*
each.ACC.SG one girl.NOM spotted.SG.F the boys.ACC
Intended: ‘The boys were spotted by one girl each.’

²Example (9b) is hard to process and parse, which is witnessed by occasional rejections, especially by “untrained” native speakers.

³The acceptability of (10) implies that the object *ty chlapce* is in an A-position. This would be in line with the proposals of Bailyn (2004) or Titov (2018) for Russian. Yet, caution is needed because different diagnostics (such as (reflexive) binding or scope) might yield contradictory results.

As already hinted at, binominal *každý* agrees with the key in case and gender, while there is a mismatch between the two in number: the key is obligatorily plural and *každý* singular; see (11).⁴

- (11) *Inspektorkám se líbil {každé / *každým / *každému*
 inspectors.DAT.PL.F REFL liked each.DAT.SG.F ~.DAT.PL ~.DAT.SG.M
*/ *každá} jeden ústav.*
 ~.NOM.SG.F one institute.NOM.M

(Intended:) ‘The inspectors (who were women) liked one institute each.’

Before we conclude this section, we would like to draw attention to a particular empirical point that will become relevant later in the paper. It concerns the ineffability of binominal *každý* associated with subject keys involving the so-called GENITIVE OF QUANTIFICATION.⁵ Consider example (12), in which the subject and key *pět studentů* involves genitive on *studentů* ‘students.GEN’, assigned by the numeral *pět* ‘five’, which bears the nominative (syncretic with accusative). In this example, no reasonable combination of case- and phi-features on the binominal ‘each’ (agreeing with either the key or the verb) leads to an acceptable result.

- (12) * *Pět studentů dostalo {každý / každé /*
 five.NOM students.GEN.M received.SG.N each.NOM.SG.M ~.NOM.SG.N
každého} jednu knihu.
 ~.GEN.SG.M/N one book.ACC.SG.F

Intended: ‘Ten students received one book each.’

The source of the ineffability is brought to light by (13), in which the key is an accusative-marked object, and while it also involves genitive of quantification on ‘students’ (and hence looks morphologically identical to the subject in (12)), it yields a fully acceptable result. We conjecture that the culprit behind the unacceptability of (12) is subject-verb agreement. If the key=subject and if the syntactically motivated subject-verb agreement (singular neuter in (12)) does not match the apparently semantically motivated key-‘each’ agreement (expected to be nominative singular masculine in (12)), the conflict results in ungrammaticality. In (13), this issue does not arise because the key is not the subject and the

⁴These properties are shared with floating *každý*; see example (5), where *každý* is masculine, as is its key.

⁵See Veselovská (1995: Chapter 8) for discussion of genitive of quantification (called there partitive genitive) in Czech and Franks (1994) for a cross-Slavic perspective.

verb does not enter in agreement with it. And as such, it does not interfere with the key–‘each’ agreement.⁶

- (13) *Pět studentů ohromila každého jedna kniha.*
 five.ACC students.GEN dazzled.SG.F each.ACC.SG.M one book.NOM.SG.F
 ‘Five students were dazzled by one book each.’

2.3 Syntax of binominal *každý*: Working hypothesis

The structure of sentences with binominal *každý* should capture at least the following two properties described above: (i) binominal *každý* forms a constituent with the share and (ii) binominal *každý* expresses partial agreement with the key – only partial because it agrees with it in case and gender, but not in number. The structure that we propose is in Figure 1, representing the sentence in (14). We assume that Czech binominal *každý* takes two arguments: an anaphoric definite description, obligatorily elided under (the imperfect) identity with its antecedent, and the share. The constituency of binominal *každý* with its share explains facts like (9b), i.e., the possibility to A’-move them together. Moreover, our analysis is conservative relative to the seminal analysis of *Safir & Stowell (1988)*.⁷

- (14) *Ti muži měli každého jednu zbraň.*
 the men.NOM.PL had.PL each.NOM.SG.M one weapon.ACC
 ‘The men had one weapon each.’

⁶As expected, the conflict is obviated also in examples like (i), where the key is in the dative and where – due to the oblique case on ‘five’ – the nominal description ‘students’ is not genitive-marked.

- (i) *Pěti studentům byla předána každému jedna kniha.*
 five.DAT students.DAT.M was given.SG.F each.DAT.SG.M one book.NOM.SG.F
 ‘Five students were given one book each.’

⁷An anonymous reviewer raises the non-trivial question of what the “head” of *každý jednu zbraň* ‘each one weapon’ is. The answer will ultimately and crucially depend on the notion of a “head” as well as one’s conviction about whether Czech NPs are headed by D or N (see *Veselovská 2018* for an extensive recent discussion); we remain agnostic with respect to the NP vs. DP debate and stick to an *ad hoc* notation, where NPs are, roughly, predicative, and DPs are argumental. The little we can say is that it is the N of the share (in (14) *zbraň* ‘weapon’) that controls NP-internal concord (except for the concord on the binominal ‘each’, as discussed above) as well as NP-external agreement with predicates (visible with subject shares, as in (13)), suggesting that it could be considered the morphosyntactic head of the complex DP.

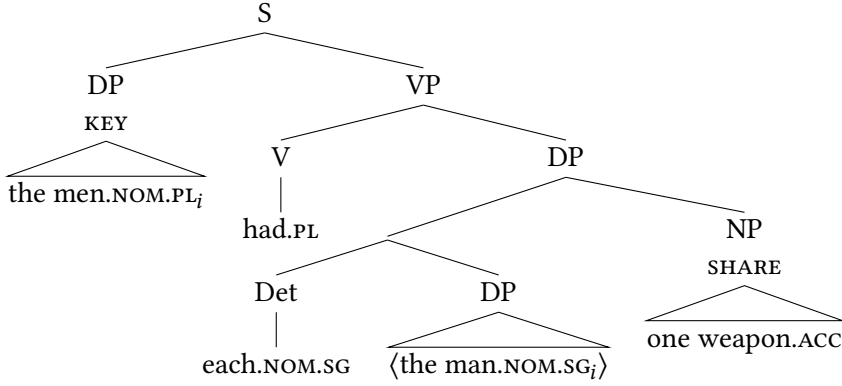


Figure 1: Hypothesized structure for (14)

The presence of the elided anaphoric definite description is motivated by the agreement facts (but also contributes to compositional semantics; see §5.3): *každý*, morphologically an adjective, must get its phi-features from some nominal. Due to the number mismatch between *každý* and its key, it is unlikely that the key licenses *každý*'s phi-features directly. For that reason, we hypothesize that the elided anaphoric definite description is a special case of independently attested overt discourse-anaphoric definite descriptions with very similar properties. An example of such a definite is given in (15). What this case of *každý* + definite NP and binominal *každý* have in common is not just anaphoricity, but also the grammatical number mismatch with the antecedent. In both cases, the antecedent is plural, while *každý* and the definite NP – if present – are singular.

- (15) *Přišli nějací muži.* *Každý* (*ten muž*_i) *měl zbraň.*
came some men.NOM.PL each.NOM.SG.M the man.NOM.M had.SG weapon
‘Some men came. Each one of them (lit. each the man) had a weapon.’

We conclude that the hypothesized obligatorily elided definite description in the argument of binominal *každý*, anaphoric to the key, is a plausible source of the partial agreement with the key, given the similarity to independently attested cases like (15). It remains to be seen and worked out how exactly this covert definite NP is licensed and why it appears to be subject to some version of Principle A (see §2.1).⁸

⁸An anonymous reviewer suggests to do away with the presently employed (pretheoretical) notion of partial or imperfect agreement and instead postulate a richer covert structure, namely ‘each one.SG of the men.PL’. We consider this solution plausible, but do not attempt to argue for or against it.

3 Background on cumulativity, collectivity, and distributivity

As we stated in §1, binominal ‘each’ is strongly distributive. Consider example (16), which can be interpreted either cumulatively (16a), collectively (16b), or distributively (16c). The cumulative construal entails that *in toto* 2 professors examined 3 students and the 3 students were examined by the 2 professors; the collective construal entails, in addition, that the professors cooperated during the examination; finally, the distributive construal entails that the total number of examined students was 6. As demonstrated by (17), binominal *each* eliminates the cumulative and the collective reading.

- | | |
|-----------------------------------------------------|--------------|
| (16) Two professors examined three students. | |
| a. ✓ 2 professors ... 3 students | CUMULATIVE |
| b. ✓ 2 professors (cooperating) ... 3 students | COLLECTIVE |
| c. ✓ 2 professors ... 6 students | DISTRIBUTIVE |
| (17) Two professors examined [each three students]. | |
| a. ✗ 2 professors ... 3 students | CUMULATIVE |
| b. ✗ 2 professors (cooperating) ... 3 students | COLLECTIVE |
| c. ✓ 2 professors ... 6 students | DISTRIBUTIVE |

Let us now turn to the interaction between binominal *each* and collectivity. Prototypical collective predicates are verbs like *gather*, *surround*, or noun phrases as *good team* or *group*. Collective predicates enforce collective readings, (18), and as such are usually incompatible with binominal *each*, as illustrated in (19). The mutual incompatibility with binominal *each* and collectives – *sine qua non* – has been noticed by many researchers (Dowty 1987; Brisson 2003; Winter 2001; Dočekal 2012).

- | | |
|---------------------------------------------------------|--------------|
| (18) The group of two authors wrote three books. | |
| a. ✗ 2 authors ... 3 books | CUMULATIVE |
| b. ✓ 2 authors (cooperating) ... 3 books | COLLECTIVE |
| c. ✗ 2 authors ... 6 books | DISTRIBUTIVE |
| (19) * The group of two authors wrote three books each. | |

The literature on collectives, e.g. Dowty 1987, Winter 2001, and Brisson 2003, distinguishes two types of collective predicates (relying on Winter's terminology) – SET COLLECTIVES, exemplified in (20a), and ATOM COLLECTIVES, exemplified in (20b). The relevant criterion is the (in)compatibility with the determiner *all* (or, more generally, the (in)compatibility with plural determiners), whereby set collectives, but not atom collectives, can involve modification by *all*; see (21).

- (20) a. gather, meet, sing together, ... SET COLLECTIVES
 b. be a good team, outnumber NP, ... ATOM COLLECTIVES
- (21) a. All the boys gathered.
 b. * All the boys are a good team.

Let us now turn to some relevant facts from Czech. Czech numerals like *dvojice* 'twosome' enforce the collective reading: while (22), using the plain-vanilla cardinal *dva* 'two', can be interpreted collectively as well as cumulatively, (23), using the numeral *dvojice* 'twosome' only allows the collective construal.⁹

- (22) *Dva sportovci vyhráli dvě medaile.*
 two athletes won.PL two medals.ACC
 'Two athletes won two medals.'
 a. ✓ 'Athlete₁ and athlete₂ cooperated and together won two medals
 (one after another, in two different contests).' COLLECTIVE
 b. ✓ 'Athlete₁ won gold & athlete₂ won silver.' CUMULATIVE
- (23) *Dvojice sportovců vyhrála dvě medaile.*
 twosome.NOM.SG.F athletes.GEN won.SG.F two medals.ACC
 'A twosome of athletes won two medals.'
 a. ✓ 'Athlete₁ and athlete₂ cooperated and together won two medals
 (one after another, in two different contests).' COLLECTIVE
 b. ✗ 'Athlete₁ won gold & athlete₂ won silver.' CUMULATIVE

⁹For recent cross-linguistic/cross-Slavic discussion and analysis of collective numerals like *dvojice* or *twosome*, see Grimm & Dočekal (to appear). Furthermore, we use the term collective numeral as a descriptive label. As an anonymous reviewer correctly points out, Czech collective numerals show signs of both being a numeral and a noun. We agree but a proper classification would require using a battery of morphological and syntactic tests. But as such a classification is orthogonal to the goals pursued in this article, we leave it for future work.

As noticed by Dotlačil (2013), set collectives allow limited distributivity effects, like distributing over reciprocals. This is not possible for atom collectives; see (24). We use this test in (25) and conclude that Czech collective numerals behave like set collectives, while nominals like *skupina* ‘group’ behave like atom collectives.¹⁰

- (24) a. Bill and Peter, together, carried the piano across each other’s lawns.
 b. * The team of students carried the piano across each other’s lawns.
- (25) a. *Dvojice* *podezřelých* *zradila* *jeden druhého*.
 twosome.NOM.SG.F suspects.GEN betrayed.SG.F one other.ACC.
 ‘The people within the twosome of suspects betrayed one another.’
 b. * *Skupina* *podezřelých* *zradila* *jeden druhého*.
 group.NOM.SG.F suspects.GEN betrayed.SG.F one other.ACC.
 Intended: ‘The people within the group of suspects betrayed one another.’

4 The puzzle

Armed with relevant background on binominal *každý/each* and with some rudimentary understanding of cumulativity, collectivity, and distributivity, we are ready to present the central data pattern. Atom collectives and binominal *each* are incompatible with each other, as evidenced by (19). Example (26) shows that this restriction holds of Czech, too. As it turns out, though, the situation is different with set collectives: example (27), structurally parallel to (26), is not just acceptable, but has the expected interpretation, whereby each of the two detectives was assigned three tasks, i.e., in total there were six tasks assigned.¹¹ Set collectives thus exhibit at least two signs of distributivity: (i) distributing over

¹⁰Notice that we follow Winter’s terminology distinguishing between atom collective predicates and set collective predicates, which is purely semantic in the sense that (uninflected) atom predicates range over atomic entities (for Winter at type $\langle e, t \rangle$) while (uninflected) set predicates range over sets (in Winter’s approach their type is $\langle \langle e, t \rangle, t \rangle$). The semantic type distinction then covers both verbal atom and set collectives in (20a)/(20b) and nominal atom and set collectives in (24). If the atom/set collective is in an argument position like in (24), further type shift (like existential closure) is needed – see §5.1. Thanks to an anonymous reviewer for raising this point.

¹¹The contrast between (26) and (27) can only be illustrated by using a non-subject key, for reasons discussed at the end of §2.2. Example (i) (just as its kin (12)) is ungrammatical, but because of an agreement issue, not interpretation.

reciprocals, as in (25), and (ii) distributing the set collective key by binominal *každý/each*, as in (27).¹²

- (26) * *Týmu detektivů byly zadány každému tři úkoly.*
 team.DAT.SG detectives.GEN were assigned each.DAT.SG three tasks.NOM
 Intended: ‘The people in the team of detectives were assigned three tasks each.’

- (27) *Dvojici detektivů byly zadány každému tři úkoly.*
 twosome.DAT.SG detectives.GEN were assigned each.DAT.SG three tasks.NOM
 ‘Each of the two detectives was assigned three tasks.’

We will formalize the difference between set and atom collectives in §5. Our analysis relies on the intuition (going back to Dowty 1987) that set collectives like *gather* afford sub-entailments: if some boys gathered in the yard, then we have some quasi-formal knowledge what is required of every boy, namely that he moves to the yard and stays there. On the other hand, atom collectives like *be a good team* do not afford such sub-entailments.

Consider now the behavior of determiner *každý* ‘each’, illustrated in (28) and (29). We see that it behaves uniformly with set collectives, (28), and with atom collectives, (29). In both cases, the distribution is over groups (pairs and teams, respectively) rather than their members. The pattern is then the following: (i)

-
- (i) * *Dvojice detektivů dostala {každý / každá / každého}*
 twosome.NOM.SG.F detectives.GEN.M got.SG.F each.NOM.SG.M ~.NOM.SG.F ~.GEN.SG.M
jeden úkol.
 one task.ACC
 Intended: ‘The two detectives got one task each.’

For completeness sake we would like to draw attention to the complex agreement pattern in examples like (27): *každému* ‘each.DAT.SG.M’ agrees with *dvojici (detektivů)* ‘twosome.DAT.SG.F (of detectives)’ in case, with *detektivů* ‘detectives.GEN.PL.M’ in gender, and with neither in number (recall that number on binominal *každý* is invariably singular).

¹²Experimental support for the contrast between (26) and (27) can be found in Kuruncziová 2020, who ran a rating experiment on Slovak, in which participants judged the acceptability of sentences with binominal *každý* in three conditions differing in the type of key: (i) cardinal key (‘two NP’) – the baseline, (ii) atom collective key (‘group NP.GEN’), and (iii) set collective key (‘twosome NP.GEN’). The set collective condition (\approx our (27)) was as acceptable as the cardinal baseline; the atom collective condition (\approx our (26)) was significantly less acceptable, which is in line with our judgements for Czech.

binominal *každý* allows distributivity over the members of set collectives but not over the members of atom collectives; (ii) determiner *každý* cannot distribute over the members of either type of collective predicates.

- (28) *Každé dvojici detektivů byly zadány tři úkoly.*
 each.DAT twosome.DAT detectives.GEN were assigned.PL three tasks.NOM
 ‘Three tasks were assigned to each twosome of detectives.’

- (29) *Každému týmu detektivů byly zadány tři úkoly.*
 each.DAT team.DAT detectives.GEN were assigned.PL three tasks.NOM
 ‘Three tasks were assigned to each team of detectives.’

5 PCDRT: The basic building blocks

In this section we introduce the basic concepts and formal instruments of the Plural Compositional Discourse Representation Theory (PCDRT; Brasoveanu 2008; Dotlačil 2013; a.o.), which we will use (in §6) to explain the central puzzle of this paper.

Let us start with some general considerations about PCDRT as opposed to more common treatments of distributivity and with predictions specific to PCDRT. Consider example (30a), where the distributive reading is default (each boy wore a different hat). Almost all standard theories of distributivity (Bennett 1974; Link 1983; Schwarzschild 1996; Winter 2001) derive this reading with the help of a distributive operator (DIST), which scopes over the whole VP and requires each atom in the denotation of the subject to distribute over the predicate.

- (30) a. The boys wore a hat.
 b. DIST(WORE A HAT)

While this approach might be extended to simple cases of binominal *each*, it fails in more complex cases (see Dotlačil 2012 for discussion) and does not offer, at least as far as we can see, a solution to our puzzle – the availability of distributive readings in constructions with binominal *každý* ‘each’ and a collective key. The biggest problem would be the VP scope of the distributive operator which predicts a clash with any collective above VP level. Recall, however, that Czech distinguishes between atom and set collectives in this respect (examples (27) and (26)). We will show that PCDRT offers a rather natural explanation of this phenomenon.

The prediction of PCDRT that is of most interest to us concerns the different mode of composition of determiner vs. binominal *each*. While determiner *each* distributes/scopes over both the restrictor and the nuclear scope, binominal *each* only distributes/scopes over the share, remaining inert with respect to the collectivity (and cumulativity) of any material outside of its scope (such as the VP or the key). It is an important goal of this paper to explore this prediction, based on Czech data.

The rest of the section is organized as follows: §5.1 introduces the PCDRT framework and applies the machinery to a cumulative interpretation of natural language sentences, section §5.2 discusses determiner *each* and its formalization in PCDRT. Section §5.3 concludes the introduction to PCDRT by formalization of binominal *each* semantics.

5.1 Cumulative readings in PCDRT

Let us start our PCDRT formalization by considering the case of cumulative readings. A cumulative reading of (31) is true, for instance, if one boy bought two books and the other boy bought one book. One information state verifying this cumulative reading of (31) is in Table 1. An INFORMATION STATE is a set of variable assignments: columns represent values of discourse referents and rows assignments to the discourse referents, also called DREFS. Unlike classic predicate logic with only one assignment of values to variables, PCDRT works with sets of assignments. The update of information states then represents a change of the context. The subject takes the value of u_1 , the object takes the value of u_2 . Drefs (u_1, u_2) are structurally correlated with each other. The predicate *buy* relates boy-book pairs per assignment (in rows) but numerical conditions are satisfied vertically.

(31) Two boys bought three books.

Table 1: Information state verifying the cumulative reading of (31)

Info state J	u_1	u_2
j_1	boy ₁	book ₁
j_2	boy ₁	book ₂
j_3	boy ₂	book ₃

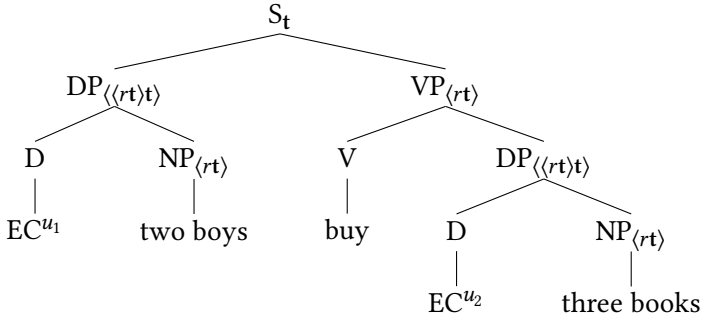


Figure 2: Structural and type-theoretic representation of (31)

The derivation of truth-conditions, which are modeled as information states such as the one in Table 1, is fully compositional. The tree in Figure 2 visualizes the most important parts of the composition. PCDRT uses the usual types of Montagovian tradition, with one slight deviation and one addition (following Dotlačil 2012): type e (the type of individuals) is replaced by type r (the type of discourse referents) and we add type t , which is an abbreviation of type $\langle\langle st\rangle\langle st\rangle t\rangle$ – the full type of discourse representation structures (see Dotlačil 2013 and Brasoveanu 2008 for details). In this system, NPs are of type $\langle rt\rangle$ and can be shifted (by existential closure/EC) to unary quantifiers of type $\langle\langle rt\rangle t\rangle$. The S node is of type t .

The PCDRT-style DISCOURSE REPRESENTATION STRUCTURE (DRS) is in (32). It specifies that there are two drefs – u_1 (subject, *boys*), with cardinality 2, and u_2 (object, *books*), with cardinality 3. The predicate *buy* is satisfied distributively (*buy* is a lexically distributive predicate), but the cumulative interpretation does not require one-by-one satisfaction of the restrictor by the scope; on the contrary, the truth conditions are much weaker, consequently the cumulative reading is modeled in info states like Table 1. Finally, the predicate relates the two drefs (pluralities): $\text{BUY}\{u_1, u_2\}$. Notice, that PCDRT treatment of plurality distinguishes between lexical and syntactic distributivity. Lexical distributivity must be satisfied assignment by assignment, in Table 1 in individual rows: boy_1 bought book_1 , then the same boy bought book_2 and, finally, boy_2 bought book_3 . But there is no (in the cumulative interpretation) syntactic distributivity which would require for each of the two boys to buy three books. We will discuss the non-lexical (syntactic) distributivity in the next section.

$$(32) \quad [u_1, u_2 \mid \#(u_1) = 2 \wedge \text{BOYS}\{u_1\} \wedge \#(u_2) = 3 \wedge \text{BOOKS}\{u_2\} \wedge \text{BUY}\{u_1, u_2\}]$$

5.2 Determiner *each* in PCDRT

Now we will introduce the key concepts of distributivity as it is treated in PCDRT. As already mentioned, PCDRT distributivity diverges from the standard approaches to distributivity – the PCDRT distributivity operator δ_{u_n} (Nouwen 2003, van den Berg 1996) does not adjoin to VP/main sentential predicate in syntax. Moreover δ_{u_n} quantifies over information states, not over the denotation of VP. Importantly, it quantifies only over those assignments where the anaphoric dref u_n has an atomic value.¹³ What we present in (33) is a simplified version of Dotlačil’s (2012) δ_{u_n} .

$$(33) \quad \delta_{u_n}(D) = \lambda I \lambda J. u_n I = u_n J \wedge \forall d \in u_n I (\#(\bigcup u_n I) = 1 \wedge D(I|_{u_n=d})(J|_{u_n=d}))$$

The δ_{u_n} is utilized in the formalization of determiner *each* in (34). Determiner *each* shifts its NP argument into a unary quantifier and it requires for each entity in the restrictor to satisfy its nuclear scope.

$$(34) \quad \llbracket \text{DET-}each^{u_n} \rrbracket = \lambda P_{\langle rt \rangle} \lambda Q_{\langle rt \rangle}. \delta_{u_n}(P(u_n)) \wedge Q(u_n)$$

Let us consider example (35), which involves an instance of determiner *each*. It would be modeled by an information state like the one shown in Table 2. The structure is in Figure 3. Note that instead of the existential closure of the NP (as in the cumulative reading case), the quantifier propagates the dref in its restrictor and distributes it over the nuclear scope.

- (35) Each of the two boys bought three books.

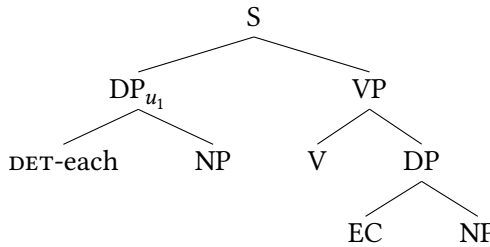


Figure 3: Structure of (35)

¹³Notice that we formalize the atomicity condition $(\#(\bigcup u_n I) = 1)$ as part of asserted conditions, not part of presupposition or generally non at-issue meaning. In this respect we follow the standard treatment of atomicity in PCDRT and remain agnostic to the question of atomicity’s proper treatment.

Table 2: Information state verifying the distributive reading of (35)

Info state J	u_1	u_2
j_1	boy ₁	book ₁
j_2	boy ₁	book ₂
j_3	boy ₁	book ₃
j_4	boy ₂	book ₄
j_5	boy ₂	book ₅
j_6	boy ₂	book ₆

The corresponding DRS is provided in (36). The crucial component that makes it different from the cumulative reading discussed above is the distributive operator δ_{u_n} , anaphoric to its restrictor (dref u_1 , subject) and scoping over the VP part of the sentence ($\delta_{u_1}([u_2] \wedge [|\#(u_2) = 3 \wedge \text{BOOKS}\{u_2\}] \wedge [|\text{BUY}\{u_1, u_2\}])$), requiring that for each atomic entity in u_1 there be 3 books in u_2 . The predicate relates boys and books. In this case the scope properties of PCDRT distributivity operator δ_{u_n} resemble the standard approach to distributivity where DIST scopes over the VP constituent.

$$(36) \quad [u_1 \mid \#(u_1) = 2 \wedge \text{BOYS}\{u_1\} \wedge \delta_{u_1}([u_2] \wedge [|\#(u_2) = 3 \wedge \text{BOOKS}\{u_2\}] \wedge [|\text{BUY}\{u_1, u_2\}])]$$

5.3 Binominal *each* in PCDRT

Just like determiner *each*, also binominal *each* involves the distributivity operator δ_{u_n} ; i.e., both types of *each* share the distributive core. Binominal *each* differs from its determiner kin in that it introduces a new discourse referent (u_m) and in that it is anaphoric to the key (again, we follow Dotlačil 2013).

$$(37) \quad \llbracket \text{BINOM-}each^{u_m} \rrbracket = \lambda v_r \lambda P_{\langle rt \rangle} \lambda Q_{\langle rt \rangle} \cdot [u_m \mid] \wedge \delta_v(P(u_m)) \wedge Q(u_m)$$

Let us see the workings of the PCDRT machinery on the example in (38): the sentence can be modeled in a plural info state like the one in Table 3; its structure is provided in Figure 4.

(38) Two athletes won three medals each.

The most important difference between the determiner and binominal *each* (for our purposes) lies in their scope behavior: whereas in (36) the scope of the distributive operator δ_{u_n} was over the whole VP, in case of binominal *each* it consists only of the share: $\delta_{u_1}([\#(u_2) = 3 \wedge \text{MEDALS}\{u_2\}])$. The full formalization is in

Table 3: Information state verifying the distributive reading of (38)

Info state J	u_1	u_2
j_1	athlete ₁	medal ₁
j_2	athlete ₁	medal ₂
j_3	athlete ₁	medal ₃
j_4	athlete ₂	medal ₄
j_5	athlete ₂	medal ₅
j_6	athlete ₂	medal ₆

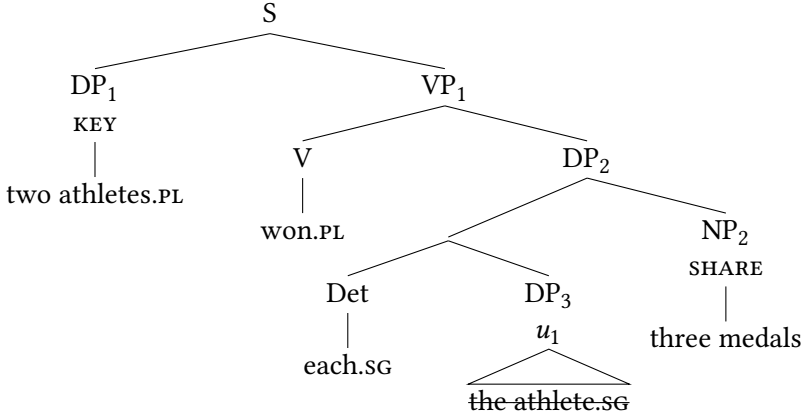


Figure 4: Structure of (38)

(39): δ_{u_1} is anaphoric to the key and requires each atomic entity in its denotation (u_1) to satisfy the share one-by-one. But the distributive operator does not scope over the lexical predicate, as it works with information states directly.

$$(39) \quad [u_1 \mid \#(u_1) = 2 \wedge \text{ATHLETES}\{u_1\} \wedge [u_2 \mid \delta_{u_1}([\#(u_2) = 3 \wedge \text{MEDALS}\{u_2\}]]] \wedge \text{WIN}\{u_1, u_2\}]$$

5.4 Interim summary

We have provided some background on PCDRT and have demonstrated how determiner and binominal *each* differ from each other. In syntactic terms, determiner *each* scopes over its whole nuclear scope, which includes the main sentential predicate, at least if the quantifier is in the subject position. The binominal *each* is anaphoric to its key but scopes only over the share, not over the clausal

predicate. While the two types of *each* yield identical readings in simple cases, such as (2b) vs. (2a), they are predicted to differ with respect to their interaction with other plurality-manipulating operators, in particular collectives.

6 A PCDRT analysis of the puzzle

The relevant pattern from §4 is presented in pseudoCzech in (40). The data show that Czech binominal *každý* ‘each’ is compatible with set collectives like *twosome* but lead to an ungrammaticality with atom collectives like *team*. If we substitute binominal *each* with determiner *each*, the result is grammatical but does not afford quantification over the members of the collections, only over the collections conceived as atomic entities.

- (40) a. Binominal ‘each’ + set collective ‘twosome’
 Twosome of detectives got three tasks each.
 \rightsquigarrow GRAMMATICAL + DISTRIBUTION OVER ATOMS
- b. * Binominal ‘each’ + atom collective ‘team’
 Team of detectives got three tasks each.
 \rightsquigarrow UNGRAMMATICAL
- c. Determiner ‘each’ + set/atom collective
 Each twosome/team of detectives was given three tasks.
 \rightsquigarrow GRAMMATICAL + DISTRIBUTION OVER GROUPS

6.1 Set collectives in PCDRT

The first step in describing the semantics behind the pattern in (40) is to assign some reasonable PCDRT formalization to set collectives. We build on the intuition that set collectives manipulate their main predicate (in case of (40) sentential) in such a way that (qua their argumenthood) the predicate must be satisfied collectively. In cases like (23), repeated here as (41), the set collective requires the predicate ‘win’ to be satisfied collectively in u_1 (subject dref).

- (41) *Dvojice sportovců vyhrála tři medaile.*
 twosome.NOM.SG.F athletes.GEN won.SG.F three medals.ACC
 ‘A twosome of athletes won three medals.’
- a. ✓ ‘Athlete₁ and athlete₂ cooperated and together won three medals
 (one after another, in three different contests).’ COLLECTIVE
- b. ✗ ‘Athlete₁ won gold & athlete₂ won silver and bronze.’ CUMULATIVE

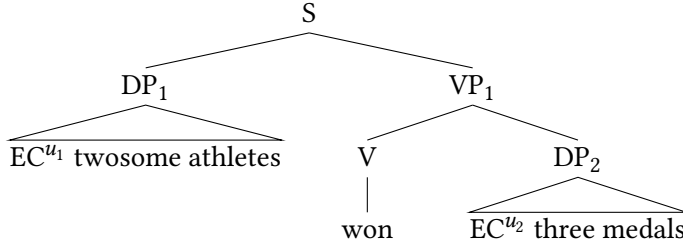


Figure 5: Structure of (41)

The syntactic structure of the composition is in Figure 5. The building blocks are in (42). DP_2 and VP_1 are applied in the standard PCDRT manner. The most important part is the set collective formalization in (42b): it is a unary quantifier over drefs which requires the predicate to be applied to the subject dref (u_1) collectively (formalized by the union operator applied to u_1). Notice that the information state for the collective reading (Table 4) resembles the cumulative info state discussed in §5.1 but there is one crucial difference formalized in (42): the set collective requires a collective interpretation on the predicate’s argument (dref u_1): $\text{WIN}\{\bigcup u_1, u_2\}$ in the formula which dictates the collective satisfaction (the whole u_1 column) of the predicate’s external argument by the discourse referent u_1 . If we look at the visualization of the information state in Table 4, we can say that the whole column u_1 is the agent of winning, unlike in the cumulative verifying info state (from the section §5.1) where each row represented the individual agent of winning. As we will see, this treatment of collectivity predicts that collectivity is local, which will give us a handle on the pattern in (40).¹⁴

- (42) a. $\llbracket S \rrbracket = [u_1, u_2 \mid \#(u_1) = 2 \wedge \text{ATHLETES}\{u_1\} \wedge \#(u_2) = 3 \wedge \text{MEDALS}\{u_2\} \wedge \text{WIN}\{\bigcup u_1, u_2\}]$
b. $\llbracket DP_1 \rrbracket = \lambda Q_{\langle \text{rt} \rangle}. [u_1 \mid \#(u_1) = 2 \wedge \text{ATHLETES}\{u_1\}] \wedge Q(\bigcup u_1)$
c. $\llbracket VP_1 \rrbracket = \lambda v_r. [u_2 \mid \#(u_2) = 2 \wedge \text{MEDALS}\{u_2\} \wedge \text{WIN}\{v, u_2\}]$
d. $\llbracket DP_2 \rrbracket = \lambda Q_{\langle \text{rt} \rangle}. [u_2 \mid \#(u_2) = 3 \wedge \text{MEDALS}\{u_2\}] \wedge Q(u_2)$

A verifying information state for (42a) is in Table 4. The set collective predicate requires the predicate *win* to be satisfied collectively by the whole u_1 but otherwise the info state looks similar to the cumulative verifying info state discussed in §5.1.

¹⁴Our formalization of set collectives is the only addition to the independently established PC-DRT machinery.

Table 4: Information state verifying (41)

Info state J	u_1	u_2
j_1	athlete ₁	medal ₁
j_2	athlete ₂	medal ₂
j_3	athlete ₁	medal ₃

6.2 Binominal *každý* + set collectives

Now we are ready to explain the puzzling compatibility of binominal *každý* ‘each’ with set collectives like *dvojice* ‘twosome’. Consider again example (43) (in pseudoCzech) and the associated syntactic structure in Figure 6.

(43) Twosome of detectives got three tasks each.

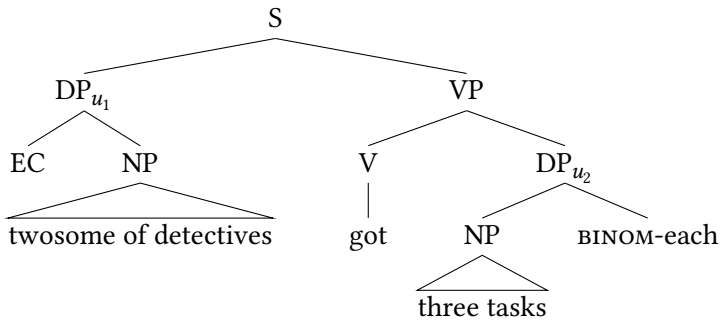


Figure 6: Structure of (43)

Let us now employ the ingredients introduced above: (i) the PCDRT formalization of binominal ‘each’ and (ii) our PCDRT formalization of set collectives. Binominal *každý* ‘each’ scopes over the share and requires every atomic entity in the key (u_1) to satisfy the share (u_2). The set-collective numeral *dvojice* ‘twosome’ requires the u_1 dref to saturate the external argument of the predicate ‘got’ collectively. The final truth-conditions are in (44). The set collective numeral imposes collectivity on the predicate ($\text{GOT}\{\bigcup u_1, u_2\}$) but otherwise does not require collectivity anywhere else. The distributivity of binominal *každý* is local as well: it scopes over the share ($\delta_{u_1}([\#(u_2) = 3 \wedge \text{TASKS}\{u_2\}])$) and requires for each atom in its anaphoric dref (u_1) to be assigned the share (u_2) with the right cardinality (3). Such truth-conditions are verified by the information state in Table 5. In sum,

in this case both set collectives and the obligatory distributive binominal *každý* are compatible with each other and cumulatively contribute to the final truth conditions in (44).

$$(44) \quad [u_1 \mid \#(u_1) = 2 \wedge \text{DETECTIVES}\{u_1\} \wedge [u_2] \mid \delta_{u_1}(\#[u_2] = 3 \\ \wedge \text{TASKS}\{u_2\}) \wedge \text{GOT}\{\bigcup u_1, u_2\}]$$

Table 5: Information state verifying (44)

Info state J	u_1	u_2
j_1	detective ₁	task ₁
j_2	detective ₁	task ₂
j_3	detective ₁	task ₃
j_4	detective ₂	task ₄
j_5	detective ₂	task ₅
j_6	detective ₂	task ₆

6.3 Cumulative readings

As we have observed and explained, set collectives and binominal *každý* ‘each’ can occur in one sentence and contribute distributivity and collectivity to the sentence’s truth-conditions without problems. Such local distributivity and local non-distributivity are then expected and predicted to be compatible with each other in all cases where the distributivity operator and other collective (or non-distributive) operator do not compete for the same argument. Let us consider another case: (45) has a salient cumulative interpretation between the subject (*dva zelináři* ‘two greengrocers’) and the indirect object (*deseti zákazníkům* ‘ten customers’) while the direct object (*tři řepy* ‘three beets’) is interpreted obligatorily distributively with respect to the indirect object. Such mixed cumulative/distributive readings would be true e.g. in a situation where greengrocer₁ sold to customer₁₊₂₊₃₊₄ beet_{1,...,12} (each of the customers_{1,...,4} bought three beets) and greengrocer₂ sold to customer₅₊₆₊₇₊₈₊₉₊₁₀ beet_{13,...,30} (again each of the greengrocer₂’s customers bought three beets). Such readings were reported to exist for determiner *every* (see Kratzer 2002 and Brasoveanu 2012) but as far as we are aware, were not noticed for binominal *each*. For reasons of space, we cannot discuss the details of the PCDRT formalization of (45) but the existence of such mixed readings support our analysis of mixed set-collective/distributive interpretations explained in the detail in section §6.2.

- (45) *Dva zelináři prodali deseti zákazníkům tři řepy*
 two greengrocers sold ten.DAT customers.DAT three.ACC beets.ACC
každému.
 each.DAT.SG
 ‘Two greengrocers sold to ten customers three beets each.’

6.4 Binominal *each* plus atom collectives

As we have observed, atom collectives and binominal *každý* ‘each’ are incompatible and lead to ungrammaticality; see the pseudoCzech example in (46). For reasons of space, we cannot discuss the details of PCDRT formalization of atom collectives. But since this was already achieved in Dotlačil 2013, we will simply follow Dotlačil’s idea of treating atom collectives as horizontal type of collectivizers, modeled in each row (assignment) as composed of a plurality but atomic from the outside. A sentence like (46) then would be modeled in an info state like Table 6: if such sentences were acceptable in a natural language. The binominal *each* would require the same group atom (detective₁ + detective₂ in the information state of Table 6) to get three tasks. Note, that the collectivity is imposed on every assignment, which is the crucial difference against the vertical collectivity of set collectives. Nevertheless, (46) is ungrammatical, which does not follow from the plurality framework we accepted, but similar constraints have been observed for sentences like (47) where binominal *each* has an atomic entity as its key. The reason why such sentences are bad is (we believe) the same as the one which leads to the unacceptability of (47): in both cases the key is a single atom (marked by singular morphology on the proper name in (47) and the atom collective in (46)), and most probably this sort of vacuous distributivity is the reason for the unacceptability of both sentences.

- (46) * The team of detectives got three tasks each.

Table 6

Info state J	u_1	u_2
j_1	detective ₁ + detective ₂	task ₁
j_2	detective ₁ + detective ₂	task ₂
j_3	detective ₁ + detective ₂	task ₃

- (47) * Petr drank two beers each.

6.5 Determiner *each* + set/atom collective

In the case of the determiner *každý* ‘each’, the distinction between the atom and set collectives vanishes, as the schematic example in (48) remind us: Both types of collectives are compatible with the determiner *každý* ‘each’. Nevertheless, the meaning such sentences get is always a quantification over collections, not over members of the collections. At first sight, it can be surprising to see that such sentences are grammatical after we observed the incompatibility of binominal *each* and atom collectives in (46). The reason for this difference is (we believe) the argument/predicate distinction between (46) and (48). The atom collective in (46) is an argument (it undergoes the existential closure of the NP at the level of DP, i.e. the expression becomes an argument) but both types of collectives in (48) are of the type (singular) predicate and as such are turned into full arguments by the quantifier *každý* ‘each’. Because of that, the collective inference of the set collective applies to its main noun predicate (the NP *detectives*). In such cases (we believe) the meaning of set and atom collectives collapses: both types of collectives would be interpreted as horizontal collectives, modeled in Table 7. A proper investigation of this idea (the prediction is that all predicative uses of set collectives should resemble atom collectives) is something we would like to pursue in future work.

(48) Each twosome/team of detectives got three tasks.

Table 7: Information state verifying (48)

Info state J	u_1	u_2
j_1	detective ₁ + detective ₂	task ₁
j_2	detective ₁ + detective ₂	task ₂
j_3	detective ₁ + detective ₂	task ₃
j_4	detective ₃ + detective ₄	task ₄
j_5	detective ₃ + detective ₄	task ₅
j_6	detective ₃ + detective ₄	task ₆

7 Summary

In this article we first described some morphosyntactic properties of Czech binominal *každý* ‘each’ and then focused on its semantic behavior. Our main goal

was to describe its interaction with set collectives. We formalized the meaning of both set collectives and the binominal *každý* in the PCDRT framework. The formalization allows us to explain their surprising compatibility. Our formalization follows the standard PCDRT treatment of determiner and binominal *each* which explains (among other things) their differing interactions with set and atom collectives. Our main contributions are the formalization of the meaning of Czech set collectives and the mapping of the landscape of different types of distributivity, as evidenced in Czech data. Some questions and predictions are left for future research, including the issue of the rigid collectivity of set collectives used as arguments of determiner *každý/each*.

Abbreviations

ACC	accusative	M	masculine
DAT	dative	N	neuter
F	feminine	NOM	nominative
GEN	genitive	PL	plural
INF	infinitive	REFL	reflexive
LOC	locative	SG	singular

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Chapter 3

New developments in the semantics of noun phrases in Slavic languages

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The paper gives a general overview of the theoretical approaches to the semantics and syntax of nominal phrases. It shows how the recent work on this topic in formal Slavistics has contributed to the further development of the theory. The following issues are addressed: What counts as reliable evidence for the assumption of the DP-layer in articleless Slavic languages? How do Slavic languages express the distinction between strong definiteness based on anaphoricity and weak definiteness based on situational uniqueness? What is the semantic concept behind definiteness contributed by NPs in the topic position? What is the meaning of special collective nouns such as Czech *dvojice* ‘a group of two people’ and Russian complex numerical measure nouns such as *strogrammovka* ‘a 100-gram glass’? What do nominal roots in Slavic languages denote before they enter different syntactic environments and how do different syntactic environments determine their interpretation? Is there evidence for the assumption of the functional projections NumP and ClassifierP in addition to NP and DP in Slavic languages?

Keywords: DP syntax, DP semantics, definiteness

1 Introduction

The goal of this article is twofold: At a general level, its aim is to give an overview of the development of theoretical approaches to the semantics (and syntax) of nominal phrases since Abney (1987) and to determine the current state of the art in this particular field. A second, more specific task is to set the scene for the contributions by the participants of the “Semantics of Noun Phrases” Workshop



held on December 6, 2018 at the University of Göttingen as a part of the 13th Conference on “Formal Description of Slavic Languages” (FDSL 13). The workshop focused on nominal categories and their interpretation and formal representation. As under the principle of compositionality the meaning of the whole is determined by the meanings of its syntactic parts, the papers address not only semantics but also the syntax of noun phrases. In this article I want to identify the main questions in the current research on noun phrases in Slavic but also in other languages and show how the papers by the workshop participants can contribute to answering some of these questions.

Since the formulation of the DP-hypothesis in [Abney 1987](#) and the introduction of D as a functional category for determiners, various functional projections between D and NP have been added to integrate nominal categories such as number and host numerals and attributive adjectives cross-linguistically (see [Alexiadou et al. 2007](#); [Borer 2005](#); [Cheng & Sybesma 1999](#); [Cheng et al. 2017](#); [Zamparelli 2000](#); a.o). Many researchers agree upon at least the DP layers depicted in [Figure 1](#).

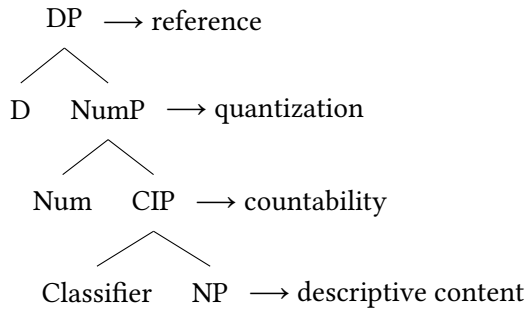


Figure 1: DP-layers

Each layer is a host for a particular element that is endowed with a particular semantic function. The head D maps the whole phrase into an argument. The DP-layer hosts strong determiners such as definite articles and demonstratives. The Numeral Phrase NumP is responsible for quantization, i.e. it is the place where cardinals and other weak determiners and quantifiers can merge. The analysis of [Borer 2005](#), but also [Cheng et al. 2017](#) and [Cheng & Sybesma 1999](#), among others, posits a Classifier head responsible for countability. It is the host for classifiers in classifier languages and for plural morphology in languages without classifiers. The lowest layer, the NP, is projected by the noun introducing descriptive content.

The internal semantic and syntactic architecture of DPs has traditionally been a topic of research in Slavic languages as well. Although most Slavic languages have no articles, the instantiation of definiteness in the D-layer has received a lot of discussion. Numeral and classifier layers have been assumed as well.

In what follows, I will go through the layers of the DP and mention some current topics of debate which serve as connecting points for contributions in this volume. We start with the highest layer, the DP.

2 DP

2.1 DP-layer: yes or no?

Since many Slavic languages lack articles, the availability of the DP projection in those languages has been hotly disputed. The question is whether nominals in articleless Slavic languages are DPs, as in the Germanic or Romance languages, or bare NPs (or possibly intermediate structures). There are three views: (i) According to the so-called Universal DP approach, adopted by Longobardi 1994 and Matthewson 1998, among others, the structure of noun phrases in languages without articles is the same as in languages with articles such as English and German: argument noun phrases are projected fully as DPs in both types. (ii) The proponents of the so-called Parameterized DP approach, among others Chierchia 1998 and Baker 2003, claim that the structure of noun phrases in languages without articles differs radically from that of languages with articles: in the former type of language, noun phrases do not project a DP. The following table from Veselovská 2014 lists the proponents of each theory in Slavic linguistics.

Table 1: Universal vs. parameterized nominal projection (Veselovská 2014: 13)

	Universal QP/DP/NP structure	Parameterized QP/DP/NP structure
Czech	Veselovská (1995; 2001)	Corver (1990)
Russian	Pereltsvaig (2007; 2013)	Bošković (2005; 2007; 2009)
Serbo-Croatian	Progovac (1998), Bašić (2004), Caruso (2012; 2013)	Zlatić (1997; 1998)
Polish	Rutkowski (2002)	

(iii) **Pereltsvaig 2006** develops a new view on the structure of noun phrases: she assumes that verbs take arguments of various semantic types and syntactic sizes. In addition to generalized quantifiers of type $\langle\langle e, t \rangle, t\rangle$ and referential DPs of type e , they are able to take arguments of type $\langle e, t \rangle$ as well. Some heads, such as the Russian cumulative prefix *na-*, select only arguments that are NPs or NumPs of predicate type $\langle e, t \rangle$.

Further evidence for the type $\langle e, t \rangle$ is the use of NPs as predicative complements of the copula verb *be*. According to **Partee 1987**, constituent conjunction requires identical semantic types, and as adjectives are treated as type $\langle e, t \rangle$, the predicative NP *millioner* ‘millionaire’ in (1) must also be of type $\langle e, t \rangle$, i.e. a non-referential predicative expression.

- (1) *On chotja i millioner, no očen' skromnyj.*
 he although and millionaire but very modest
 ‘Although he is a millionaire, he is very modest.’ (Russian)

There is also a semantic argument in favor of a DP layer for some occurrences of noun phrases in Russian. Normally, the DP is identified as the locus of referentiality. **Borer 2005**, for example, states that only DPs have referential indices and can be interpreted as arguments. In my work (**Geist 2010**), I have shown that bare NPs in the topic position in Russian are always referential and definite, see (2). In the first clause, *mal'čik* ‘boy’ and *devočka* ‘girl’ introduce new discourse referents and the topical noun phrase *devočka* in the second clause anaphorically picks out the same individual girl introduced in the first clause. If a non-definite use is intended, the NP *devočka* must be accompanied by the indefiniteness marker *odin* ‘one’.

- (2) *Ja uvidela mal'čika i devočku. Devočka nesla korzinku.*
 I saw boy and girl girl bore basket
 ‘I saw a boy and a girl. The girl bore a basket.’ (Russian)

Provided that DPs are the locus of referentiality and bare nouns in Russian can be used referentially at least in the topic position, it must be assumed that they may project a DP.

Besides semantic evidence in favor of a DP level in Slavic, there is some syntactic support in the literature (see the overview in **Pereltsvaig 2013**). At least the following arguments have been mentioned: (i) a rigid order of prenominal adjectives, (ii) a split between light and heavy adjectival modifiers, and (iii) maximal interpretation of prenominal possessives. We will not discuss all these arguments but will look only at the last one, since it was addressed in the workshop.

Kagan & Pereltsvaig 2014 observe that the syntactic position of the possessive adjective relative to the numeral has an impact on the interpretation of the whole phrase, see (3). In the unmarked order (2a), where the possessive follows the numeral, the phrase is neither interpreted as maximal nor exhaustive: Dima may have more than five books. Kagan & Pereltsvaig 2014 discuss the possible alternative marked order (2b) where the possessive precedes the numeral. Unlike (2a), this phrase can only receive a maximal or exhaustive interpretation and presupposes that Dima has exactly five books. Kagan & Pereltsvaig 2014 assume that the maximal interpretation in (2b) comes about as a result of the placement of the possessive in a syntactically high position in the DP-domain above the numeral in the NumP. The possessive adjective in (2a), however, is placed low, in the NP-domain which is below NumP.

- (3) a. *pjat' Diminyx knig* not maximal
five Dima.GEN.PL books
'Dima's five books'
- b. *Diminyx pjat' knig* maximal/exhaustive
Dima.GEN.PL five books
'Dima's five books' (Russian)

But there is evidence that even NPs preceded by possessive adjectives without numerals can project full DPs. As (2) shows, nouns occurring with possessive adjectives can be used anaphorically: *Petin kollega* in the second clause in (2) picks up the colleague introduced in the previous clause. Since anaphoric NPs must be DPs following Kagan & Pereltsvaig (2014), we would assume that the possessive adjective *Petin* in *Petin kollega* 'Petja's colleague' is a modifier that applies at the high DP-level and hence indicates the presence of a zero D-head. Pereltsvaig's (2007) position is more radical, she analyzes the possessive adjective as a D-element.

- (4) *U Peti novyj kollega i u Niny tože. Petin kollega očen' molod.*
with Petja new colleague and with Nina too Petja's colleague very
young
'Petja has a new colleague and Nina, too. Petja's colleague is very young.'
(Russian)

Gepner (2021 [this volume]) investigates the morphological and syntactic properties of possessives but also demonstratives and the quantifier *každyj* in Russian.

She examines whether these expressions can provide evidence for a DP-layer. She shows, based on their morphological and syntactic properties, that prenominal possessives and demonstratives behave as adjectives rather than determiners and argues that they do not fulfill the criteria for a D-element. NPs accompanied by them can occur in predicate positions as shown in (4) and in existential sentences, where typical DPs such as proper names are excluded.

- (5) *Ivan byl petinym kollegoj.*
Ivan was Peter's.INS colleague.INS
'Ivan was Peter's colleague.'(Russian)

According to Gepner, the interpretation of the possessive adjective in the predicate NP such as (4) does not differ from the interpretation of possessive adjective in an argument NP such as (2). She assumes that in both cases possessive adjectives modify the noun within NP, e.g., are always placed low in the structure. An exception is the quantifier *každyj*. Despite patterning morphologically with adjectives, it has the syntax and semantics of a quantifier and behaves like a functional element outside the NP. Gepner leaves open in which functional layer *každyj* is hosted. But is the interpretation of the possessive NP in (4) really the same as the interpretation of the possessive NP in (2)?

There is an old observation that the interpretation of possessive NPs depends on their use as arguments or as predicates. Jespersen 1965 discusses example (5) in English:

- (6) a. The captain of the vessel was my brother.
b. My brother was captain of the vessel.

Jespersen says that in (6a) *my brother* in the predicate position means 'one of my brothers', or leaves it unspecified whether the speaker has more than one brother, whereas *my brother* in the argument position in (6b) has a maximal/unique or exhaustive interpretation 'the speaker's only brother'. To explain this difference in interpretation, Kagan & Pereltsvaig 2014 would assume that the possessive adjective *my* in (6b) is placed in the "high" DP-domain, which excludes the non-exhaustive interpretation. The placement of the possessive in the "low" NP-domain as in (6a) would only specify the relational meaning of *brother* and have no restriction on the unique/non-unique interpretation. Under Gepner's analysis, however, *my* would be integrated low in the NP-domain in both cases. The lack of non-maximal interpretation of the possessive NP in the argument position in (6b) should then be explained in a different way. The validity of both analyses should be compared in the future research.

2.2 DP-layer: two types of definites

Many languages such as German and Mauritian Creole differentiate between two types of definites (Löbner 2011; Schwarz 2009; 2013; Jenks 2015). Definites that have a more complex form indicate an anaphoric link and are called “strong definites”. Definites with a simpler form, the so-called “weak definites”, express definiteness based on situational UNIQUENESS. In standard German, the contrast between the two forms is reflected in cases where a definite can contract with a preceding preposition. The contracted form is the weak form, indicating situational uniqueness while the non-contracted one is a strong form indicating an anaphoric use.

- (7) a. *Hans ging zu dem Haus.*
Hans went to the_{strong} house
‘Hans went to the house.’
b. *Hans ging zum Haus.*
Hans went to-the_{weak} house
‘Hans went to the house.’ (German; Schwarz 2009: 12)

Czardybon (2017) shows that a similar distinction between anaphoric and situational definiteness is made in Polish: The demonstrative *ten* as a strong determiner can optionally be used to signal anaphoric definiteness, while weak bare NPs are used if definiteness is based on situational uniqueness. In (8a), *mężczyzna* ‘man’ in its second occurrence is used anaphorically and is accompanied by *ten*. In (8b), the situationally unique NPs *odległość* ‘distance’, *sufit* ‘ceiling’, and *podłoga* ‘floor’ are used without *ten*, i.e., have a weak form.

- (8) a. *Widziałem jak do pokoju wchodził mężczyzna. Kiedy*
see.PST.1SG how in room.LOC enter.PST man when
wszedłem obaczyłem że przy ornie stoi ten
enter.PST.1SG see.PST.1SG that at window.LOC stand.PRS DET
mężczyzna.
man
‘I saw a man go into the room. When I entered I saw that the man was standing at the window.’
(Polish; Szwedek 1976: 96–97, cited from Czardybon 2017: 50)

- b. [...] *odległość od sufitu do podłogi wynosi 2,85*
distance from ceiling.GEN to floor.GEN amount.3SG.PRS 2.85
metra
meter
‘the distance from the ceiling to the floor amounts to 2.85 meters.’
(Polish; Czardybon 2017: 74)

Thus, Polish obeys the standard correspondence between the form of the definite (strong vs. weak) and the use of definite descriptions (situationally unique vs. anaphoric).

Šimík (2021 [this volume]) studies the two types of definiteness in Czech. Czech also uses bare NPs and NPs combined with a demonstrative for definite reference. However, as Šimík shows, strong demonstrative NPs are also able to refer to situationally unique objects in addition to weak bare NPs, unlike Polish. To explain the division of labor between weak bare NPs and strong demonstrative NPs he distinguishes between two types of situational uniqueness: accidental uniqueness and inherent uniqueness. An object is inherently unique if it is unique in all relevant situations that are “like” the mentioned situation. An accidentally unique object is unique in the mentioned situation but need not be unique in other similar situations. Šimík discusses an example with the noun *tabule* ‘blackboard’. The object referred to by this NP is typically unique in all classroom situations. By contrast, the object denoted by the NP *book* can be unique in a particular situation but it need not be unique in other situations in which books are typically involved. Thus, the referent of *the book* can only be accidentally unique. Accidentally unique objects in Czech are referred to by strong demonstrative NPs, while inherently unique objects are referred to by weak bare NPs, see Table 2.

Table 2: Two types of definiteness in Polish and Czech.

Polish (Czardybon 2017)	use	anaphoric	situationally unique	
	form	strong form: demonstrative NP	weak form: bare NP	
Czech Šimík (this volume)	use	anaphoric	accidentally unique	inherently unique
	form	strong form: demonstrative NP	weak form: bare NP	

Šimík uses situation semantics and proposes an analysis in which inherent uniqueness is taken to be a property of topic situations and accidental uniqueness a property of demonstratives. He shows how other types of NPs such as generic, anaphoric, and non-specific indefinite NPs can be analyzed within this framework.

2.3 DP-layer: semantics of definiteness

If definiteness is what the DP-layer may contribute, the question is what the semantic concept or notion behind it is. Definiteness is often considered to correspond to FAMILIARITY: The individual referred to by the definite expression has often been assumed to be familiar to the speaker and hearer, e.g. if the NP is used anaphorically (Christophersen 1939; Heim 1982). In the philosophical tradition, definiteness is assumed to correspond to uniqueness: a definite description conveys that there is exactly one individual in the situation that satisfies the description (Chierchia 1998; Dayal 2004; a.o.). Besides familiarity and uniqueness there are other less prominent notions of definiteness that we will not consider here. The two main notions of definiteness are in competition if we want to explain the use of the definite article in languages such as German or English: most uses can be explained by both theories, but some occurrences receive a better account in the familiarity theory and the others by uniqueness.

The common tenet is that languages without definite articles can convey the same meaning as definite descriptions do in languages with articles, albeit with different formal means. According to the classical view, bare NPs as themes obligatorily receive a definite interpretation in articleless Slavic languages. In my work Geist 2010 I explain and formalize this traditional belief using the notion of aboutness topic instead of theme, see (8).

- (9) *Situation*: I saw a boy and a girl.
Devočka vošla v dom.
 girl came into house
 ‘The (*a) girl entered {the/a} house.’ (Russian; Geist 2010: 193)

Given the situation in (8), we can utter *devočka vošla v dom*, where *devočka* can only receive a definite referential interpretation; an indefinite interpretation (that it was another girl, not anaphorically related to the previously mentioned girl) is not available. In the topical use of the bare NP in (8), familiarity and uniqueness coincide and it cannot be decided which notion of definiteness can better capture the definite interpretation.

In very recent work, Šimík & Demian 2020 provide experimental evidence that bare singular NPs as topics in Russian do not convey uniqueness. They test two scenarios via pictures: In the first picture there is a locomotive and a unique disconnected carriage. In the second picture there is a locomotive and two carriages, one of them is disconnected.

The authors show that Russian speakers can use sentence (9) with *vagon* ‘carriage’ as topic to describe both pictures, although the second picture violates uniqueness.

- (10) *Vagon otcepilsja*
carriage disconnected
‘The carriage got disconnected.’ (Russian; Šimík & Demian 2020: 15)

From this they conclude that definiteness contributed by topical definiteness is not based on uniqueness.

The investigation by Seres & Borik (2021 [this volume]) is in line with Šimík & Demian’s (2020) observations. They have the intuition that alleged uniqueness contributed by bare NPs as topics can be overridden in appropriate contexts such as (10). However, definiteness conveyed by the definite article for topical definites in English contributes strong uniqueness and cannot be overridden.

- (11) a. *Direktor našej školy pojavilsja v tok-šou.*
director.NOM our school.GEN appeared in talkshow
‘The director of our school appeared in a talkshow.’
b. *Drugoј direktor (našej) školy vystupil na radio.*
other director.NOM our school.GEN spoke on radio
‘The other director (of our school) spoke on the radio.’
(Russian; Seres & Borik 2021 [this volume])

To account for the difference between Russian and English, Seres & Borik assume that the kind of definiteness expressed by bare nominals in Russian is better captured in terms of pragmatic strengthening than the uniqueness presupposition. While uniqueness contributed by the definite article is semantic in nature and can be formally represented by the iota operator, this representation is not appropriate for the purely pragmatic definiteness contributed by topicality of bare NPs in articleless languages. Following Heim (2011), Seres & Borik propose that bare nominal phrases in articleless Russian are born indefinite. Definiteness can be achieved by pragmatic strengthening of an indefinite and can have different sources: ‘ontological’ (or ‘situational’) uniqueness, topicality and/or familiarity/anaphoricity. All these can be seen as sources for the familiarity of the

object. Thus, familiarity rather than uniqueness in the narrow sense underlies definiteness contributed by the topical use of bare NPs.

To conclude, the experimental findings by Šimík & Demian 2020 and the investigation of uniqueness by Seres & Borik suggest that languages differ not only in the means that contribute to the expression of definiteness, but also in the type of concept of definiteness. Definite articles do not contribute the same type of definiteness as topicality in articleless languages.

3 Numeral phrase: numerals and collectivity

In addition to ordinary numerals, Slavic languages have a special class, the so-called collective numerals. Collective numerals can be nominalized and denote groups of n members of x , see Czech *dvojice* ‘twosome = a group of two people’. Since such collectives range over sets they have been called SET COLLECTIVES. Dočekal & Šimík (2021 [this volume]) address the behavior of set collectives in comparison to collectives denoted by collective nouns such as *skupina* ‘group’ in Czech. The latter type of collectives ranges over atomic entities and has been called ATOM COLLECTIVES.

Although collections are composed of a plurality in both types of collectives, they differ in the accessibility of the members of that plurality. The difference becomes apparent in combinations with the determiner *each* and the binominal *each*. The two uses of *each* are illustrated in (11).

- (12) a. Each [_{PP} of the three girls] has bought three books. (determiner *each*)
 b. Two girls have bought [_{NP} three books] each. (binominal *each*)

Dočekal & Šimík show that the determiner *každý* ‘each’ cannot distribute over the members of collectives regardless of type. Binominal *každý*, on the other hand, can combine with set collectives yielding distribution over members of the collection, while it is excluded with atom collectives.

Thus, binominal *každý* serves as a diagnostic to test the accessibility of the members of collections and to distinguish between the two types of collectives: while the individual members of set collectives are at least weakly accessible, members of atom collectives are completely inaccessible and atomic from the outside.

The authors model the complex interaction of determiner *každý* and binominal *každý* with set and atom collectives within the Plural Compositional Discourse Representation Theory (PCDRT). The main idea of the formalization is this: while determiner *každý* distributes over both the restrictor and the nuclear

Table 3: Atom collectives and set collectives

	<i>skupina sportovců</i> ‘group of athletes’ (atom collectives)	<i>dvojice sportovců</i> ‘a group of two athletes’ (set collectives)
distribution over members with determiner <i>každý</i>	*	*
distribution over members with binominal <i>každý</i>	*	⊠

scope, binominal *každý* only distributes over the distributive share denoted by the NP it is attached to, remaining neutral with respect to the collectivity and cumulativity of the material outside of its scope. This explains its compatibility with set collectives and its incompatibility with atom collectives.

4 Classifier phrase

4.1 Types of classifiers

The typological literature on the mass/count distinction commonly distinguishes between classifier and non-classifier languages. In classifier languages such as Chinese, nouns cannot be directly combined with a numeral and need the help of a classifier, the so-called individual or natural unit classifier (Krifka 1989; 1995), as in (12).

- (13) *san zhi bi*
three CL pencil
‘three pencils’ (Chinese)

According to Cheng & Sybesma 1999, count classifiers in Chinese primarily serve to name the unit in which the entity denoted by the noun naturally occurs. Classifier languages are contrasted with non-classifier languages such as Slavic languages, which have count nouns that can be directly combined with numerals, as in (13).

- (14) *pjat’ stolov*
five tables.GEN.PL
‘five tables’ (Russian)

But non-classifier languages can also use a type of classifier which occurs in combination with mass nouns, see (21):

- (15) *tri litra vina*
 three liter.GEN.SG wine.GEN.SG
 ‘three liters of wine’ (Russian)

However, classifiers of the type in (21) considerably differ from Chinese classifiers in their status (lexical vs. grammatical) and function (measuring vs. counting). Cheng & Sybesma 1999 and Li 2013 argue that individual classifiers in Chinese have the status of a grammatical category. Their function is that of counting, which has to be distinguished from measuring. According to Rothstein 2010, “Counting puts entities (which already count as ‘one’) in correspondence with the natural numbers, while measuring assigns a (plural) individual a value on a dimensional scale” (Rothstein 2010: 386). The numeral ‘five’ in the counting context (13) provides a property of a plural entity in the denotation of N, expressing how many atomic units the plurality has. Rothstein argues that measure classifiers such as in (21) should rather be considered a lexical category for measuring. In (21) ‘liter’ combines with a numeral and together they form a measure predicate. In the syntactic composition, this predicate applies to sets of quantities expressed by the mass noun ‘wine’ and assigns a value to it on a measure scale calibrated in liters.

Theories of the mass/count distinction suggest that languages have grammatical classifiers only if they have no number morphology. Thus, count nouns and grammaticalized classifiers should be in complementary distribution (e.g., Borer 2005; Chierchia 2010). Khrizman 2016 shows that this complementarity does not hold in Russian. In addition to number morphology, Russian has three grammaticalized classifiers *štuka* ‘item’, *čelovek* ‘person’, and *golova* ‘head’, which optionally occur in numeral constructions with plural, see (22).

- (16) *pjat’ (štuk) jaic*
 five item.GEN.PL egg.GEN.PL
 ‘five eggs’ (Russian; Khrizman 2016)

According to Khrizman 2016, such classifiers differ from Chinese-type individual classifiers and should rather be analyzed as a special class of measure words. They denote functions that map quantities of entities onto the value on a scale calibrated in natural units in the sense of Krifka 1989; 1995.

4.2 Diminutive suffixes as classifiers

So far we have characterized classifiers that are morphologically free morphemes. However, in some languages the classifying function can also be performed by suffixes as bound morphemes. As [de Belder 2008](#) shows, the diminutive suffix in Dutch turns mass nouns into count nouns, hence it functions as a classification device, yet it is compatible with overt morphological plural marking, see (16).

- (17) *veel brod-je-s*
many bread-DIM-PL
‘many rolls’ (Dutch; [de Belder 2008: 2](#))

In Russian, diminutive suffixes such as *-ka* may also perform a classifier function if combined with a mass noun, see (17).

- (18) a. *železo – železka – dve železki*
iron iron.DIM.F two iron.DIM.PL
‘iron – a piece of iron – two pieces of iron’
b. *šokolad – šokoladka – dve šokoladki*
chocolate chocolate.DIM.F two chocolate.DIM.PL
‘chocolate – a bar of chocolate – two bars of chocolate’ (Russian)

In (17), *-ka* has a function identical to the function of unit classifiers in Chinese. First, it turns an uncountable noun into a countable one: while *železo* and *šokolad* are mass nouns, *železka* and *šokoladka* denote countable units, which are compatible with numerals and plural formation. Second, being a suffix, *-ka* has the status of a grammatical morpheme. Third, besides determining countability, *-ka* also triggers a gender shift of the noun: the noun becomes feminine. This feature qualifies *ka-* for being a syntactic functional head, the Classifier head.

[Khrizman \(2021 \[this volume\]\)](#) addresses other formations with the suffix *-ka*, complex numerical measure nouns in Russian such as *stogrammovka* ‘a 100-gram glass’ or *dvuxlitrovka* ‘a two-liter-jar’. In colloquial Russian, such morphologically complex nouns are productively constructed out of a numeral and a measure noun as shown in (18).

- (19) *sto- grammov- ka vodki*
hundred.NOM- gram.GEN.PL- ka vodka.GEN
‘a 100-gram glass of vodka’ (Russian; [Khrizman 2021 \[this volume\]](#))

Khrizman shows that complex measure nouns with *-ka* are count nouns as they can be pluralized and modified by numerals. Such measure nouns denote containers, i.e., actual objects. For example, *stogrammovka* in (18) refers to objects which weigh 100 grams. The nature of the object is determined by context (a 100-ml bottle/tube, a 100-gram package/bar etc.). Khrizman analyzes such nouns within Rothstein's (2017) theory of counting and measuring. This approach treats complex measure nouns as predicates denoting sets of discrete entities with certain measure properties, e.g. properties of having a value on a dimensional scale calibrated in certain units. For instance, *stogrammovka* denotes a set of disjointed entities (jars, bottles etc.), which have the property of having the value 100 on a weight scale calibrated in gram units. The suffix *-ka* in the formation of measure nouns contributes a shift from a measure interpretation to a container interpretation, thus its function is similar to container nouns (e.g. glass).

Khrizman's analysis has an important implication for the theory of noun phrases. It has been argued in the literature that all count nouns originate from mass nouns and bare count nouns should be derived from mass nouns via lexically concealed individuating operators (Krifka 1989; 1995; Rothstein 2017; Sutton & Filip 2016). Diminutive suffixes like *-ka* could then be seen as a morphological realization of such operators.

5 NP

Now we move on to the lowest layer of the DP, the NP-layer. What does the head of the NP denote? There has been a surge of interest in this question in the literature that has led to many different views. According to Chierchia 1998, languages vary in what their NPs are able to denote. The syntax-semantics mapping is not universally fixed and, in some languages, nouns can denote kinds (or masses), in others they denote objects, but there are also languages where some nouns denote objects and others denote kinds. This view was questioned in Borer 2005. She argues that the basic interpretation of a noun crosslinguistically is a non-countable interpretation as mass (sometimes also interpreted as kind). A non-countable noun can achieve countability by combining with functional heads in the syntax. This basic idea was further developed by Borik & Espinal 2012; 2015 and applied to Russian in Borik & Espinal 2012. They assume that bare nouns in Russian as in (19) primarily denote properties of kinds of individuals that share the property denoted by the noun. If they occur in an argument position as topics they are interpreted as definite and form a DP that refers directly to a kind.

- (20) *Slon skoro budet zanesen v Krasnuju Knigu esli na nego ne*
 elephant soon will listed in red book if on him not
perestanut ochotit'sja.
 stop hunt
 'The elephant will soon be listed in the IUCN Red List if people don't stop
 hunting it.' (Russian; Borik & Espinal 2012: 137)

Syntactically, the kind-referring DP has the simple structure in (15a). Borik & Espinal argue that kind-denoting nouns are definite and numberless. In their syntactic structure, D is the locus of the iota operator. If the bare noun is used to refer to a concrete individual as in (21), it must be shifted into the object domain and receive number. This shift from kinds to objects is performed by the realization operator R of Carlson 1977. R is specified by number in NumP, see (15b). No NumP is involved in the composition of a definite kind interpretation.

- (21) a. $[_{DP} D [_{NP} N]]$ kind
 b. $[_{DP} D [_{NumP} NUM_{[-PL]} [_{NP} N]]]$ individual object

- (22) *Slon podošel k vode.*
 elephant came to water
 'The elephant came to the water.' (Russian)

Kwapiszewski & Fuellenbach (2021 [this volume]) use the work of Borik & Espinal as the point of departure for their analysis of the DP-structure in Polish. They argue that bare noun counterparts of *slon* in (19) are definite and numberless in Polish, just as in other languages. Following Borik & Espinal, the authors assume that bare NPs in Polish denote properties of kinds, which must be bound by the iota operator in D to license direct reference to kinds. Number projection is not available in their syntactic representation. In noun phrases referring to object instances of kinds as in (21), the number projection is available and it is responsible for the derivation of individual instances of kinds.

However, Kwapiszewski & Fuellenbach show that Borik & Espinal's approach is incompatible with the theory of intersective kind modification by McNally & Boleda 2004, who analyze modifiers such as *Bengal* in (22) as intersective modifiers of kinds. Since Borik & Espinal consider nouns to be singleton sets of kinds, such a treatment of modification is impossible.

- (23) *Tygrys bengalski jest na skraju wymarcia.*
 tiger.NOM Bengal.M is on verge extinction.GEN
 ‘The Bengal tiger is on the verge of extinction.’
 (Polish; Kwapiszewski & Fuellenbach 2021 [this volume])

To solve this problem, the authors introduce a subkind operator (SK) into the semantics and link it to the functional head Classifier in the syntax. Thus *tygrys* ‘tiger’ in (22) has the following structure:

- (24) [DP +DEF [NumberP –PLURAL [ClassifierP SK [NP tygrys]]]] subkind reading

Kwapiszewski & Fuellenbach assume that *tygrys* in (23) refers to a subkind rather than to an object, the classifier head is specified as a SK. Thus, the classifier head can have different functions: deriving subkinds of a kind by the SK or deriving object instances of a kind by the realization operator (R). The authors propose the following structure for definite object-denoting and subkind-denoting NPs in Polish:

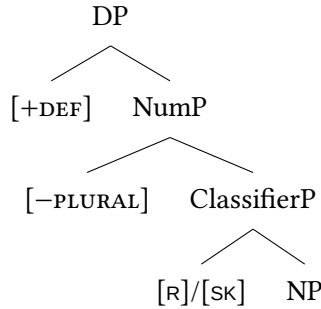


Figure 2: The structure of a DP in Polish (Kwapiszewski & Fuellenbach 2021 [this volume])

If the SK is introduced in the classifier head, the NP denotes a set of subkinds and a kind-modifying adjective such as *bengalski* ‘Bengal’ can intersectively modify the subkinds. All in all, this work substantiates the assumption of the functional layers DP, NumP, and ClassifierP besides NP in Polish.

6 Conclusions

To conclude, the contributions in this volume address different theoretical issues which have been under controversial discussion in the literature. The contributors develop and improve the theory of NP structure, relativize some previous

assumptions, and show how languages without articles specify the NP structure, assumed to be universal in natural language. The main findings can be summarized as follows:

- Although pronominal possessive adjectives in Russian are not determiners, they have been assumed to be placed in the high DP-domain if the NP occurs in an argument position. Since NPs with possessives can also occur in predicate positions, where referential DPs are normally excluded, the question arises whether the possessive is hosted lower in the structure in this case. Alternatively, it can be assumed that possessives are always integrated low in the NP, see [Gepner \(2021 \[this volume\]\)](#). Under this analysis, the exhaustive interpretation of the NP with possessive in an argument position requires a different explanation. These two analyses should be compared in future research.
- Generally, weak and strong definiteness has been assumed to correspond to anaphoric vs. situational uniqueness, respectively. The example of Czech shows that the boundary between the two types of definiteness may alternatively lie within situational uniqueness dividing situational uniqueness into accidental and inherent uniqueness, see [Šimík \(2021 \[this volume\]\)](#).
- Languages without articles have been assumed to express definiteness by topicality. However, definiteness contributed by topicality seems to be different from definiteness contributed by the definite article in languages that have it. While topicality indicates familiarity, the definite article indicates uniqueness, see [Seres & Borik \(2021 \[this volume\]\)](#).
- In the formation of collectives in Polish, we have to distinguish between two types with respect to the accessibility of its members: set collectives formed of collective numerals and atom collectives formed of collective nouns such as *group*. While the individual members of the set collectives are at least weakly accessible, the members of the atom collectives are completely inaccessible and atomic from the outside. The binominal *každý* is sensitive to this distinction, see [Dočekal & Šimík \(2021 \[this volume\]\)](#).
- The nominalizing suffix *-ka* in Russian, also used as a diminutive suffix, can serve as a classifier turning non-countable expressions such as measure expressions but also mass nouns into countable nouns. This function renders it similar to classifiers in Chinese, see [Khrizman \(2021 \[this volume\]\)](#).

- Nouns in articleless Slavic languages, in particular Polish, can be analyzed as being numberless and denoting properties of kinds. They can refer to a kind if combined with a iota operator in D. But they can be turned into object level denotation or subkind denotation by the classifier head and then be combined with a numeral in NumP, see Kwapiszewski & Fuellenbach (2021 [this volume]).

The workshop contributors present their generalizations and analyses developed for single languages: Russian, Polish, or Czech. Future research should show whether these generalizations extend to other Slavic languages as well and what implications this has for the theory of the universal structure of NPs.

Abbreviations

CL	classifier	NOM	nominative
DET	determiner	PL	plural
DIM	diminutive	PRS	present
F	feminine	PST	past
GEN	genitive	SG	singular
INS	instrumental	1	first person
LOC	locative	3	third person
M	masculine		

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Chapter 4

New developments in the semantics of noun phrases in Slavic languages

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The paper gives a general overview of the theoretical approaches to the semantics and syntax of nominal phrases. It shows how the recent work on this topic in formal Slavistics has contributed to the further development of the theory. The following issues are addressed: What counts as reliable evidence for the assumption of the DP-layer in articleless Slavic languages? How do Slavic languages express the distinction between strong definiteness based on anaphoricity and weak definiteness based on situational uniqueness? What is the semantic concept behind definiteness contributed by NPs in the topic position? What is the meaning of special collective nouns such as Czech *dvojice* ‘a group of two people’ and Russian complex numerical measure nouns such as *strogrammovka* ‘a 100-gram glass’? What do nominal roots in Slavic languages denote before they enter different syntactic environments and how do different syntactic environments determine their interpretation? Is there evidence for the assumption of the functional projections NumP and ClassifierP in addition to NP and DP in Slavic languages?

Keywords: DP syntax, DP semantics, definiteness

1 Introduction

The goal of this article is twofold: At a general level, its aim is to give an overview of the development of theoretical approaches to the semantics (and syntax) of nominal phrases since Abney (1987) and to determine the current state of the art in this particular field. A second, more specific task is to set the scene for the contributions by the participants of the “Semantics of Noun Phrases” Workshop



held on December 6, 2018 at the University of Göttingen as a part of the 13th Conference on “Formal Description of Slavic Languages” (FDSL 13). The workshop focused on nominal categories and their interpretation and formal representation. As under the principle of compositionality the meaning of the whole is determined by the meanings of its syntactic parts, the papers address not only semantics but also the syntax of noun phrases. In this article I want to identify the main questions in the current research on noun phrases in Slavic but also in other languages and show how the papers by the workshop participants can contribute to answering some of these questions.

Since the formulation of the DP-hypothesis in [Abney 1987](#) and the introduction of D as a functional category for determiners, various functional projections between D and NP have been added to integrate nominal categories such as number and host numerals and attributive adjectives cross-linguistically (see [Alexiadou et al. 2007](#); [Borer 2005](#); [Cheng & Sybesma 1999](#); [Cheng et al. 2017](#); [Zamparelli 2000](#); a.o). Many researchers agree upon at least the DP layers depicted in [Figure 1](#).

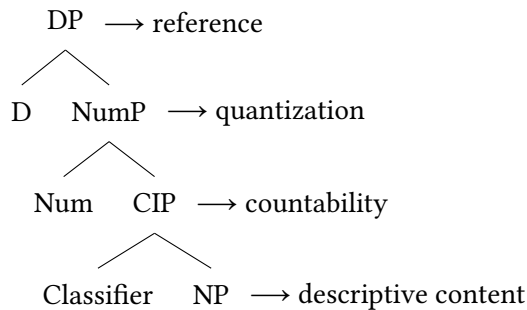


Figure 1: DP-layers

Each layer is a host for a particular element that is endowed with a particular semantic function. The head D maps the whole phrase into an argument. The DP-layer hosts strong determiners such as definite articles and demonstratives. The Numeral Phrase NumP is responsible for quantization, i.e. it is the place where cardinals and other weak determiners and quantifiers can merge. The analysis of [Borer 2005](#), but also [Cheng et al. 2017](#) and [Cheng & Sybesma 1999](#), among others, posits a Classifier head responsible for countability. It is the host for classifiers in classifier languages and for plural morphology in languages without classifiers. The lowest layer, the NP, is projected by the noun introducing descriptive content.

The internal semantic and syntactic architecture of DPs has traditionally been a topic of research in Slavic languages as well. Although most Slavic languages have no articles, the instantiation of definiteness in the D-layer has received a lot of discussion. Numeral and classifier layers have been assumed as well.

In what follows, I will go through the layers of the DP and mention some current topics of debate which serve as connecting points for contributions in this volume. We start with the highest layer, the DP.

2 DP

2.1 DP-layer: yes or no?

Since many Slavic languages lack articles, the availability of the DP projection in those languages has been hotly disputed. The question is whether nominals in articleless Slavic languages are DPs, as in the Germanic or Romance languages, or bare NPs (or possibly intermediate structures). There are three views: (i) According to the so-called Universal DP approach, adopted by Longobardi 1994 and Matthewson 1998, among others, the structure of noun phrases in languages without articles is the same as in languages with articles such as English and German: argument noun phrases are projected fully as DPs in both types. (ii) The proponents of the so-called Parameterized DP approach, among others Chierchia 1998 and Baker 2003, claim that the structure of noun phrases in languages without articles differs radically from that of languages with articles: in the former type of language, noun phrases do not project a DP. The following table from Veselovská 2014 lists the proponents of each theory in Slavic linguistics.

Table 1: Universal vs. parameterized nominal projection (Veselovská 2014: 13)

	Universal QP/DP/NP structure	Parameterized QP/DP/NP structure
Czech	Veselovská (1995; 2001)	Corver (1990)
Russian	Pereltsvaig (2007; 2013)	Bošković (2005; 2007; 2009)
Serbo-Croatian	Progovac (1998), Bašić (2004), Caruso (2012; 2013)	Zlatić (1997; 1998)
Polish	Rutkowski (2002)	

(iii) **Pereltsvaig 2006** develops a new view on the structure of noun phrases: she assumes that verbs take arguments of various semantic types and syntactic sizes. In addition to generalized quantifiers of type $\langle\langle e, t \rangle, t\rangle$ and referential DPs of type e , they are able to take arguments of type $\langle e, t \rangle$ as well. Some heads, such as the Russian cumulative prefix *na-*, select only arguments that are NPs or NumPs of predicate type $\langle e, t \rangle$.

Further evidence for the type $\langle e, t \rangle$ is the use of NPs as predicative complements of the copula verb *be*. According to **Partee 1987**, constituent conjunction requires identical semantic types, and as adjectives are treated as type $\langle e, t \rangle$, the predicative NP *millioner* ‘millionaire’ in (1) must also be of type $\langle e, t \rangle$, i.e. a non-referential predicative expression.

- (1) *On chotja i millioner, no očen' skromnyj.*
 he although and millionaire but very modest
 ‘Although he is a millionaire, he is very modest.’ (Russian)

There is also a semantic argument in favor of a DP layer for some occurrences of noun phrases in Russian. Normally, the DP is identified as the locus of referentiality. **Borer 2005**, for example, states that only DPs have referential indices and can be interpreted as arguments. In my work (**Geist 2010**), I have shown that bare NPs in the topic position in Russian are always referential and definite, see (2). In the first clause, *mal'čik* ‘boy’ and *devočka* ‘girl’ introduce new discourse referents and the topical noun phrase *devočka* in the second clause anaphorically picks out the same individual girl introduced in the first clause. If a non-definite use is intended, the NP *devočka* must be accompanied by the indefiniteness marker *odin* ‘one’.

- (2) *Ja uvidela mal'čika i devočku. Devočka nesla korzinku.*
 I saw boy and girl girl bore basket
 ‘I saw a boy and a girl. The girl bore a basket.’ (Russian)

Provided that DPs are the locus of referentiality and bare nouns in Russian can be used referentially at least in the topic position, it must be assumed that they may project a DP.

Besides semantic evidence in favor of a DP level in Slavic, there is some syntactic support in the literature (see the overview in **Pereltsvaig 2013**). At least the following arguments have been mentioned: (i) a rigid order of prenominal adjectives, (ii) a split between light and heavy adjectival modifiers, and (iii) maximal interpretation of prenominal possessives. We will not discuss all these arguments but will look only at the last one, since it was addressed in the workshop.

Kagan & Pereltsvaig 2014 observe that the syntactic position of the possessive adjective relative to the numeral has an impact on the interpretation of the whole phrase, see (3). In the unmarked order (2a), where the possessive follows the numeral, the phrase is neither interpreted as maximal nor exhaustive: Dima may have more than five books. Kagan & Pereltsvaig 2014 discuss the possible alternative marked order (2b) where the possessive precedes the numeral. Unlike (2a), this phrase can only receive a maximal or exhaustive interpretation and presupposes that Dima has exactly five books. Kagan & Pereltsvaig 2014 assume that the maximal interpretation in (2b) comes about as a result of the placement of the possessive in a syntactically high position in the DP-domain above the numeral in the NumP. The possessive adjective in (2a), however, is placed low, in the NP-domain which is below NumP.

- (3) a. *pjat' Diminyx knig* not maximal
 five Dima.GEN.PL books
 'Dima's five books'
- b. *Diminyx pjat' knig* maximal/exhaustive
 Dima.GEN.PL five books
 'Dima's five books' (Russian)

But there is evidence that even NPs preceded by possessive adjectives without numerals can project full DPs. As (2) shows, nouns occurring with possessive adjectives can be used anaphorically: *Petin kollega* in the second clause in (2) picks up the colleague introduced in the previous clause. Since anaphoric NPs must be DPs following Kagan & Pereltsvaig (2014), we would assume that the possessive adjective *Petin* in *Petin kollega* 'Petja's colleague' is a modifier that applies at the high DP-level and hence indicates the presence of a zero D-head. Pereltsvaig's (2007) position is more radical, she analyzes the possessive adjective as a D-element.

- (4) *U Peti novyj kollega i u Niny tože. Petin kollega očen' molod.*
 with Petja new colleague and with Nina too Petja's colleague very
 young
 'Petja has a new colleague and Nina, too. Petja's colleague is very young.'
 (Russian)

Gepner (2021 [this volume]) investigates the morphological and syntactic properties of possessives but also demonstratives and the quantifier *každyj* in Russian.

She examines whether these expressions can provide evidence for a DP-layer. She shows, based on their morphological and syntactic properties, that prenominal possessives and demonstratives behave as adjectives rather than determiners and argues that they do not fulfill the criteria for a D-element. NPs accompanied by them can occur in predicate positions as shown in (4) and in existential sentences, where typical DPs such as proper names are excluded.

- (5) *Ivan byl petinym kollegoj.*
Ivan was Peter's.INS colleague.INS
'Ivan was Peter's colleague.'(Russian)

According to Gepner, the interpretation of the possessive adjective in the predicate NP such as (4) does not differ from the interpretation of possessive adjective in an argument NP such as (2). She assumes that in both cases possessive adjectives modify the noun within NP, e.g., are always placed low in the structure. An exception is the quantifier *každyj*. Despite patterning morphologically with adjectives, it has the syntax and semantics of a quantifier and behaves like a functional element outside the NP. Gepner leaves open in which functional layer *každyj* is hosted. But is the interpretation of the possessive NP in (4) really the same as the interpretation of the possessive NP in (2)?

There is an old observation that the interpretation of possessive NPs depends on their use as arguments or as predicates. Jespersen 1965 discusses example (5) in English:

- (6) a. The captain of the vessel was my brother.
b. My brother was captain of the vessel.

Jespersen says that in (6a) *my brother* in the predicate position means 'one of my brothers', or leaves it unspecified whether the speaker has more than one brother, whereas *my brother* in the argument position in (6b) has a maximal/unique or exhaustive interpretation 'the speaker's only brother'. To explain this difference in interpretation, Kagan & Pereltsvaig 2014 would assume that the possessive adjective *my* in (6b) is placed in the "high" DP-domain, which excludes the non-exhaustive interpretation. The placement of the possessive in the "low" NP-domain as in (6a) would only specify the relational meaning of *brother* and have no restriction on the unique/non-unique interpretation. Under Gepner's analysis, however, *my* would be integrated low in the NP-domain in both cases. The lack of non-maximal interpretation of the possessive NP in the argument position in (6b) should then be explained in a different way. The validity of both analyses should be compared in the future research.

2.2 DP-layer: two types of definites

Many languages such as German and Mauritian Creole differentiate between two types of definites (Löbner 2011; Schwarz 2009; 2013; Jenks 2015). Definites that have a more complex form indicate an anaphoric link and are called “strong definites”. Definites with a simpler form, the so-called “weak definites”, express definiteness based on situational UNIQUENESS. In standard German, the contrast between the two forms is reflected in cases where a definite can contract with a preceding preposition. The contracted form is the weak form, indicating situational uniqueness while the non-contracted one is a strong form indicating an anaphoric use.

- (7) a. *Hans ging zu dem Haus.*
 Hans went to the_{strong} house
 ‘Hans went to the house.’
 b. *Hans ging zum Haus.*
 Hans went to-the_{weak} house
 ‘Hans went to the house.’ (German; Schwarz 2009: 12)

Czardybon (2017) shows that a similar distinction between anaphoric and situational definiteness is made in Polish: The demonstrative *ten* as a strong determiner can optionally be used to signal anaphoric definiteness, while weak bare NPs are used if definiteness is based on situational uniqueness. In (8a), *mężczyzna* ‘man’ in its second occurrence is used anaphorically and is accompanied by *ten*. In (8b), the situationally unique NPs *odległość* ‘distance’, *sufit* ‘ceiling’, and *podłoga* ‘floor’ are used without *ten*, i.e., have a weak form.

- (8) a. *Widziałem jak do pokoju wchodził mężczyzna. Kiedy*
 see.PST.1SG how in room.LOC enter.PST man when
wszedłem obaczyłem że przy ornie stoi ten
 enter.PST.1SG see.PST.1SG that at window.LOC stand.PRS DET
mężczyzna.
 man
 ‘I saw a man go into the room. When I entered I saw that the man
 was standing at the window.’
 (Polish; Szwedek 1976: 96–97, cited from Czardybon 2017: 50)

- b. [...] *odległość od sufitu do podłogi wynosi 2,85*
distance from ceiling.GEN to floor.GEN amount.3SG.PRS 2.85
metra
meter
‘the distance from the ceiling to the floor amounts to 2.85 meters.’
(Polish; Czardybon 2017: 74)

Thus, Polish obeys the standard correspondence between the form of the definite (strong vs. weak) and the use of definite descriptions (situationally unique vs. anaphoric).

Šimík (2021 [this volume]) studies the two types of definiteness in Czech. Czech also uses bare NPs and NPs combined with a demonstrative for definite reference. However, as Šimík shows, strong demonstrative NPs are also able to refer to situationally unique objects in addition to weak bare NPs, unlike Polish. To explain the division of labor between weak bare NPs and strong demonstrative NPs he distinguishes between two types of situational uniqueness: accidental uniqueness and inherent uniqueness. An object is inherently unique if it is unique in all relevant situations that are “like” the mentioned situation. An accidentally unique object is unique in the mentioned situation but need not be unique in other similar situations. Šimík discusses an example with the noun *tabule* ‘blackboard’. The object referred to by this NP is typically unique in all classroom situations. By contrast, the object denoted by the NP *book* can be unique in a particular situation but it need not be unique in other situations in which books are typically involved. Thus, the referent of *the book* can only be accidentally unique. Accidentally unique objects in Czech are referred to by strong demonstrative NPs, while inherently unique objects are referred to by weak bare NPs, see Table 2.

Table 2: Two types of definiteness in Polish and Czech.

Polish (Czardybon 2017)	use	anaphoric	situationally unique	
	form	strong form: demonstrative NP	weak form: bare NP	
Czech Šimík (this volume)	use	anaphoric	accidentally unique	inherently unique
	form	strong form: demonstrative NP	weak form: bare NP	

Šimík uses situation semantics and proposes an analysis in which inherent uniqueness is taken to be a property of topic situations and accidental uniqueness a property of demonstratives. He shows how other types of NPs such as generic, anaphoric, and non-specific indefinite NPs can be analyzed within this framework.

2.3 DP-layer: semantics of definiteness

If definiteness is what the DP-layer may contribute, the question is what the semantic concept or notion behind it is. Definiteness is often considered to correspond to FAMILIARITY: The individual referred to by the definite expression has often been assumed to be familiar to the speaker and hearer, e.g. if the NP is used anaphorically (Christophersen 1939; Heim 1982). In the philosophical tradition, definiteness is assumed to correspond to uniqueness: a definite description conveys that there is exactly one individual in the situation that satisfies the description (Chierchia 1998; Dayal 2004; a.o.). Besides familiarity and uniqueness there are other less prominent notions of definiteness that we will not consider here. The two main notions of definiteness are in competition if we want to explain the use of the definite article in languages such as German or English: most uses can be explained by both theories, but some occurrences receive a better account in the familiarity theory and the others by uniqueness.

The common tenet is that languages without definite articles can convey the same meaning as definite descriptions do in languages with articles, albeit with different formal means. According to the classical view, bare NPs as themes obligatorily receive a definite interpretation in articleless Slavic languages. In my work Geist 2010 I explain and formalize this traditional belief using the notion of aboutness topic instead of theme, see (8).

- (9) *Situation*: I saw a boy and a girl.
Devočka vošla v dom.
 girl came into house
 ‘The (*a) girl entered {the/a} house.’ (Russian; Geist 2010: 193)

Given the situation in (8), we can utter *devočka vošla v dom*, where *devočka* can only receive a definite referential interpretation; an indefinite interpretation (that it was another girl, not anaphorically related to the previously mentioned girl) is not available. In the topical use of the bare NP in (8), familiarity and uniqueness coincide and it cannot be decided which notion of definiteness can better capture the definite interpretation.

In very recent work, Šimík & Demian 2020 provide experimental evidence that bare singular NPs as topics in Russian do not convey uniqueness. They test two scenarios via pictures: In the first picture there is a locomotive and a unique disconnected carriage. In the second picture there is a locomotive and two carriages, one of them is disconnected.

The authors show that Russian speakers can use sentence (9) with *vagon* ‘carriage’ as topic to describe both pictures, although the second picture violates uniqueness.

- (10) *Vagon otcepilsja*
carriage disconnected
‘The carriage got disconnected.’ (Russian; Šimík & Demian 2020: 15)

From this they conclude that definiteness contributed by topical definiteness is not based on uniqueness.

The investigation by Seres & Borik (2021 [this volume]) is in line with Šimík & Demian’s (2020) observations. They have the intuition that alleged uniqueness contributed by bare NPs as topics can be overridden in appropriate contexts such as (10). However, definiteness conveyed by the definite article for topical definites in English contributes strong uniqueness and cannot be overridden.

- (11) a. *Direktor našej školy pojavilsja v tok-šou.*
director.NOM our school.GEN appeared in talkshow
‘The director of our school appeared in a talkshow.’
b. *Drugojej direktor (našej) školy vystupil na radio.*
other director.NOM our school.GEN spoke on radio
‘The other director (of our school) spoke on the radio.’
(Russian; Seres & Borik 2021 [this volume])

To account for the difference between Russian and English, Seres & Borik assume that the kind of definiteness expressed by bare nominals in Russian is better captured in terms of pragmatic strengthening than the uniqueness presupposition. While uniqueness contributed by the definite article is semantic in nature and can be formally represented by the iota operator, this representation is not appropriate for the purely pragmatic definiteness contributed by topicality of bare NPs in articleless languages. Following Heim (2011), Seres & Borik propose that bare nominal phrases in articleless Russian are born indefinite. Definiteness can be achieved by pragmatic strengthening of an indefinite and can have different sources: ‘ontological’ (or ‘situational’) uniqueness, topicality and/or familiarity/anaphoricity. All these can be seen as sources for the familiarity of the

object. Thus, familiarity rather than uniqueness in the narrow sense underlies definiteness contributed by the topical use of bare NPs.

To conclude, the experimental findings by Šimík & Demian 2020 and the investigation of uniqueness by Seres & Borik suggest that languages differ not only in the means that contribute to the expression of definiteness, but also in the type of concept of definiteness. Definite articles do not contribute the same type of definiteness as topicality in articleless languages.

3 Numeral phrase: numerals and collectivity

In addition to ordinary numerals, Slavic languages have a special class, the so-called collective numerals. Collective numerals can be nominalized and denote groups of n members of x , see Czech *dvojice* ‘twosome = a group of two people’. Since such collectives range over sets they have been called SET COLLECTIVES. Dočekal & Šimík (2021 [this volume]) address the behavior of set collectives in comparison to collectives denoted by collective nouns such as *skupina* ‘group’ in Czech. The latter type of collectives ranges over atomic entities and has been called ATOM COLLECTIVES.

Although collections are composed of a plurality in both types of collectives, they differ in the accessibility of the members of that plurality. The difference becomes apparent in combinations with the determiner *each* and the binominal *each*. The two uses of *each* are illustrated in (11).

- (12) a. Each [_{PP} of the three girls] has bought three books. (determiner *each*)
 b. Two girls have bought [_{NP} three books] each. (binominal *each*)

Dočekal & Šimík show that the determiner *každý* ‘each’ cannot distribute over the members of collectives regardless of type. Binominal *každý*, on the other hand, can combine with set collectives yielding distribution over members of the collection, while it is excluded with atom collectives.

Thus, binominal *každý* serves as a diagnostic to test the accessibility of the members of collections and to distinguish between the two types of collectives: while the individual members of set collectives are at least weakly accessible, members of atom collectives are completely inaccessible and atomic from the outside.

The authors model the complex interaction of determiner *každý* and binominal *každý* with set and atom collectives within the Plural Compositional Discourse Representation Theory (PCDRT). The main idea of the formalization is this: while determiner *každý* distributes over both the restrictor and the nuclear

Table 3: Atom collectives and set collectives

	<i>skupina sportovců</i> ‘group of athletes’ (atom collectives)	<i>dvojice sportovců</i> ‘a group of two athletes’ (set collectives)
distribution over members with determiner <i>každý</i>	*	*
distribution over members with binominal <i>každý</i>	*	⊠

scope, binominal *každý* only distributes over the distributive share denoted by the NP it is attached to, remaining neutral with respect to the collectivity and cumulativity of the material outside of its scope. This explains its compatibility with set collectives and its incompatibility with atom collectives.

4 Classifier phrase

4.1 Types of classifiers

The typological literature on the mass/count distinction commonly distinguishes between classifier and non-classifier languages. In classifier languages such as Chinese, nouns cannot be directly combined with a numeral and need the help of a classifier, the so-called individual or natural unit classifier (Krifka 1989; 1995), as in (12).

- (13) *san zhi bi*
three CL pencil
‘three pencils’ (Chinese)

According to Cheng & Sybesma 1999, count classifiers in Chinese primarily serve to name the unit in which the entity denoted by the noun naturally occurs. Classifier languages are contrasted with non-classifier languages such as Slavic languages, which have count nouns that can be directly combined with numerals, as in (13).

- (14) *pjat’ stolov*
five tables.GEN.PL
‘five tables’ (Russian)

But non-classifier languages can also use a type of classifier which occurs in combination with mass nouns, see (21):

- (15) *tri litra vina*
 three liter.GEN.SG wine.GEN.SG
 ‘three liters of wine’ (Russian)

However, classifiers of the type in (21) considerably differ from Chinese classifiers in their status (lexical vs. grammatical) and function (measuring vs. counting). Cheng & Sybesma 1999 and Li 2013 argue that individual classifiers in Chinese have the status of a grammatical category. Their function is that of counting, which has to be distinguished from measuring. According to Rothstein 2010, “Counting puts entities (which already count as ‘one’) in correspondence with the natural numbers, while measuring assigns a (plural) individual a value on a dimensional scale” (Rothstein 2010: 386). The numeral ‘five’ in the counting context (13) provides a property of a plural entity in the denotation of N, expressing how many atomic units the plurality has. Rothstein argues that measure classifiers such as in (21) should rather be considered a lexical category for measuring. In (21) ‘liter’ combines with a numeral and together they form a measure predicate. In the syntactic composition, this predicate applies to sets of quantities expressed by the mass noun ‘wine’ and assigns a value to it on a measure scale calibrated in liters.

Theories of the mass/count distinction suggest that languages have grammatical classifiers only if they have no number morphology. Thus, count nouns and grammaticalized classifiers should be in complementary distribution (e.g., Borer 2005; Chierchia 2010). Khrizman 2016 shows that this complementarity does not hold in Russian. In addition to number morphology, Russian has three grammaticalized classifiers *štuka* ‘item’, *čelovek* ‘person’, and *golova* ‘head’, which optionally occur in numeral constructions with plural, see (22).

- (16) *pjat’ (štuk) jaic*
 five item.GEN.PL egg.GEN.PL
 ‘five eggs’ (Russian; Khrizman 2016)

According to Khrizman 2016, such classifiers differ from Chinese-type individual classifiers and should rather be analyzed as a special class of measure words. They denote functions that map quantities of entities onto the value on a scale calibrated in natural units in the sense of Krifka 1989; 1995.

4.2 Diminutive suffixes as classifiers

So far we have characterized classifiers that are morphologically free morphemes. However, in some languages the classifying function can also be performed by suffixes as bound morphemes. As [de Belder 2008](#) shows, the diminutive suffix in Dutch turns mass nouns into count nouns, hence it functions as a classification device, yet it is compatible with overt morphological plural marking, see (16).

- (17) *veel brod-je-s*
many bread-DIM-PL
‘many rolls’ (Dutch; [de Belder 2008: 2](#))

In Russian, diminutive suffixes such as *-ka* may also perform a classifier function if combined with a mass noun, see (17).

- (18) a. *železo – železka – dve železki*
iron iron.DIM.F two iron.DIM.PL
‘iron – a piece of iron – two pieces of iron’
b. *šokolad – šokoladka – dve šokoladki*
chocolate chocolate.DIM.F two chocolate.DIM.PL
‘chocolate – a bar of chocolate – two bars of chocolate’ (Russian)

In (17), *-ka* has a function identical to the function of unit classifiers in Chinese. First, it turns an uncountable noun into a countable one: while *železo* and *šokolad* are mass nouns, *železka* and *šokoladka* denote countable units, which are compatible with numerals and plural formation. Second, being a suffix, *-ka* has the status of a grammatical morpheme. Third, besides determining countability, *-ka* also triggers a gender shift of the noun: the noun becomes feminine. This feature qualifies *ka-* for being a syntactic functional head, the Classifier head.

[Khrizman \(2021 \[this volume\]\)](#) addresses other formations with the suffix *-ka*, complex numerical measure nouns in Russian such as *stogrammovka* ‘a 100-gram glass’ or *dvuxlitrovka* ‘a two-liter-jar’. In colloquial Russian, such morphologically complex nouns are productively constructed out of a numeral and a measure noun as shown in (18).

- (19) *sto- grammov- ka vodki*
hundred.NOM- gram.GEN.PL- ka vodka.GEN
‘a 100-gram glass of vodka’ (Russian; [Khrizman 2021 \[this volume\]](#))

Khrizman shows that complex measure nouns with *-ka* are count nouns as they can be pluralized and modified by numerals. Such measure nouns denote containers, i.e., actual objects. For example, *stogrammovka* in (18) refers to objects which weigh 100 grams. The nature of the object is determined by context (a 100-ml bottle/tube, a 100-gram package/bar etc.). Khrizman analyzes such nouns within Rothstein's (2017) theory of counting and measuring. This approach treats complex measure nouns as predicates denoting sets of discrete entities with certain measure properties, e.g. properties of having a value on a dimensional scale calibrated in certain units. For instance, *stogrammovka* denotes a set of disjointed entities (jars, bottles etc.), which have the property of having the value 100 on a weight scale calibrated in gram units. The suffix *-ka* in the formation of measure nouns contributes a shift from a measure interpretation to a container interpretation, thus its function is similar to container nouns (e.g. glass).

Khrizman's analysis has an important implication for the theory of noun phrases. It has been argued in the literature that all count nouns originate from mass nouns and bare count nouns should be derived from mass nouns via lexically concealed individuating operators (Krifka 1989; 1995; Rothstein 2017; Sutton & Filip 2016). Diminutive suffixes like *-ka* could then be seen as a morphological realization of such operators.

5 NP

Now we move on to the lowest layer of the DP, the NP-layer. What does the head of the NP denote? There has been a surge of interest in this question in the literature that has led to many different views. According to Chierchia 1998, languages vary in what their NPs are able to denote. The syntax-semantics mapping is not universally fixed and, in some languages, nouns can denote kinds (or masses), in others they denote objects, but there are also languages where some nouns denote objects and others denote kinds. This view was questioned in Borer 2005. She argues that the basic interpretation of a noun crosslinguistically is a non-countable interpretation as mass (sometimes also interpreted as kind). A non-countable noun can achieve countability by combining with functional heads in the syntax. This basic idea was further developed by Borik & Espinal 2012; 2015 and applied to Russian in Borik & Espinal 2012. They assume that bare nouns in Russian as in (19) primarily denote properties of kinds of individuals that share the property denoted by the noun. If they occur in an argument position as topics they are interpreted as definite and form a DP that refers directly to a kind.

- (20) *Slon skoro budet zanesen v Krasnuju Knigu esli na nego ne*
 elephant soon will listed in red book if on him not
perestanut ochotit'sja.
 stop hunt
 'The elephant will soon be listed in the IUCN Red List if people don't stop
 hunting it.' (Russian; Borik & Espinal 2012: 137)

Syntactically, the kind-referring DP has the simple structure in (15a). Borik & Espinal argue that kind-denoting nouns are definite and numberless. In their syntactic structure, D is the locus of the iota operator. If the bare noun is used to refer to a concrete individual as in (21), it must be shifted into the object domain and receive number. This shift from kinds to objects is performed by the realization operator R of Carlson 1977. R is specified by number in NumP, see (15b). No NumP is involved in the composition of a definite kind interpretation.

- (21) a. $[_{DP} D [_{NP} N]]$ kind
 b. $[_{DP} D [_{NumP} NUM_{[-PL]} [_{NP} N]]]$ individual object

- (22) *Slon podošel k vode.*
 elephant came to water
 'The elephant came to the water.' (Russian)

Kwapiszewski & Fuellenbach (2021 [this volume]) use the work of Borik & Espinal as the point of departure for their analysis of the DP-structure in Polish. They argue that bare noun counterparts of *slon* in (19) are definite and numberless in Polish, just as in other languages. Following Borik & Espinal, the authors assume that bare NPs in Polish denote properties of kinds, which must be bound by the iota operator in D to license direct reference to kinds. Number projection is not available in their syntactic representation. In noun phrases referring to object instances of kinds as in (21), the number projection is available and it is responsible for the derivation of individual instances of kinds.

However, Kwapiszewski & Fuellenbach show that Borik & Espinal's approach is incompatible with the theory of intersective kind modification by McNally & Boleda 2004, who analyze modifiers such as *Bengal* in (22) as intersective modifiers of kinds. Since Borik & Espinal consider nouns to be singleton sets of kinds, such a treatment of modification is impossible.

- (23) *Tygrys bengalski jest na skraju wymarcia.*
 tiger.NOM Bengal.M is on verge extinction.GEN
 ‘The Bengal tiger is on the verge of extinction.’
 (Polish; Kwapiszewski & Fuellenbach 2021 [this volume])

To solve this problem, the authors introduce a subkind operator (SK) into the semantics and link it to the functional head Classifier in the syntax. Thus *tygrys* ‘tiger’ in (22) has the following structure:

- (24) [DP +DEF [NumberP –PLURAL [ClassifierP SK [NP tygrys]]]] subkind reading

Kwapiszewski & Fuellenbach assume that *tygrys* in (23) refers to a subkind rather than to an object, the classifier head is specified as a SK. Thus, the classifier head can have different functions: deriving subkinds of a kind by the SK or deriving object instances of a kind by the realization operator (R). The authors propose the following structure for definite object-denoting and subkind-denoting NPs in Polish:

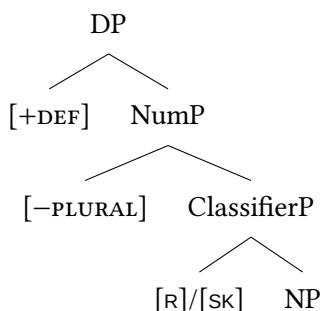


Figure 2: The structure of a DP in Polish (Kwapiszewski & Fuellenbach 2021 [this volume])

If the SK is introduced in the classifier head, the NP denotes a set of subkinds and a kind-modifying adjective such as *bengalski* ‘Bengal’ can intersectively modify the subkinds. All in all, this work substantiates the assumption of the functional layers DP, NumP, and ClassifierP besides NP in Polish.

6 Conclusions

To conclude, the contributions in this volume address different theoretical issues which have been under controversial discussion in the literature. The contributors develop and improve the theory of NP structure, relativize some previous

assumptions, and show how languages without articles specify the NP structure, assumed to be universal in natural language. The main findings can be summarized as follows:

- Although prenominal possessive adjectives in Russian are not determiners, they have been assumed to be placed in the high DP-domain if the NP occurs in an argument position. Since NPs with possessives can also occur in predicate positions, where referential DPs are normally excluded, the question arises whether the possessive is hosted lower in the structure in this case. Alternatively, it can be assumed that possessives are always integrated low in the NP, see [Gepner \(2021 \[this volume\]\)](#). Under this analysis, the exhaustive interpretation of the NP with possessive in an argument position requires a different explanation. These two analyses should be compared in future research.
- Generally, weak and strong definiteness has been assumed to correspond to anaphoric vs. situational uniqueness, respectively. The example of Czech shows that the boundary between the two types of definiteness may alternatively lie within situational uniqueness dividing situational uniqueness into accidental and inherent uniqueness, see [Šimík \(2021 \[this volume\]\)](#).
- Languages without articles have been assumed to express definiteness by topicality. However, definiteness contributed by topicality seems to be different from definiteness contributed by the definite article in languages that have it. While topicality indicates familiarity, the definite article indicates uniqueness, see [Seres & Borik \(2021 \[this volume\]\)](#).
- In the formation of collectives in Polish, we have to distinguish between two types with respect to the accessibility of its members: set collectives formed of collective numerals and atom collectives formed of collective nouns such as *group*. While the individual members of the set collectives are at least weakly accessible, the members of the atom collectives are completely inaccessible and atomic from the outside. The binominal *každý* is sensitive to this distinction, see [Dočekal & Šimík \(2021 \[this volume\]\)](#).
- The nominalizing suffix *-ka* in Russian, also used as a diminutive suffix, can serve as a classifier turning non-countable expressions such as measure expressions but also mass nouns into countable nouns. This function renders it similar to classifiers in Chinese, see [Khrizman \(2021 \[this volume\]\)](#).

- Nouns in articleless Slavic languages, in particular Polish, can be analyzed as being numberless and denoting properties of kinds. They can refer to a kind if combined with a iota operator in D. But they can be turned into object level denotation or subkind denotation by the classifier head and then be combined with a numeral in NumP, see Kwapiszewski & Fuellenbach (2021 [this volume]).

The workshop contributors present their generalizations and analyses developed for single languages: Russian, Polish, or Czech. Future research should show whether these generalizations extend to other Slavic languages as well and what implications this has for the theory of the universal structure of NPs.

Abbreviations

CL	classifier	NOM	nominative
DET	determiner	PL	plural
DIM	diminutive	PRS	present
F	feminine	PST	past
GEN	genitive	SG	singular
INS	instrumental	1	first person
LOC	locative	3	third person
M	masculine		

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Chapter 5

The pragmatic effects of Macedonian *li* – an empirical study

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In this paper we provide empirical data concerning the pragmatics of the particle *li* following nominal phrases in polar questions in Macedonian. Since in previous literature *li* has been analyzed as a focus particle, we put forward two hypotheses on its effect in questions that can follow from focus marking: i) that *li* signals uniqueness of the entity that is denoted by the constituent it is attached to or ii) that *li* signals surprise about the entity denoted by the constituent it is attached to. We have conducted an online survey that shows that polar questions in which *li* is adjacent to a fronted XP are felicitous in contexts containing surprise, regardless of whether that XP is unique or not. We account for these findings using questions under discussion and alternative semantics.

Keywords: question particles, semantics, pragmatics, focus, Macedonian

1 Introduction

This paper is concerned with the semantic-pragmatic conditions for the seemingly optional particle *li*, which, in Standard Macedonian (Eastern South Slavic; henceforth just Macedonian), mostly appears in polar questions.

There are at least six ways of forming polar questions in Macedonian, involving interaction between word order, intonation, and the particle *li*, as illustrated



in (1).^{1,2}

- | | | |
|-----|--------------------------------------------------------------------------------------------|----------------------------|
| (1) | a. <i>Saka-š musli?</i>
want-PRS.2SG muesli
'Do you want muesli?' | Intonation Question (IntQ) |
| | b. <i>Dali saka-š musli?</i>
Q want-PRS.2SG muesli
'Do you want muesli?' | Dali Question (DaliQ) |
| | c. <i>Musli li saka-š?</i>
muesli LI want-PRS.2SG
'Do you want MUESLI?' ³ | XP-li Question (XP-LiQ) |
| | d. <i>Musli, saka-š li?</i>
muesli want-PRS.2SG LI
'As for muesli, DO you want it?' | Topic Question (TopQ) |
| | e. <i>Saka-š li musli?</i>
want-PRS.2SG LI muesli
'DO you want muesli?' | V-li Question (V-LiQ) |

¹If not indicated otherwise, all examples are from Macedonian.

²Other environments in which *li* can appear, albeit rarely, are habitual conditionals in (i.a), content questions in (i.b), alternative questions in (i.c) and a special kind of duratives in (i.d). We mention these here for completeness.

- | | | |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| (i) | a. <i>Mine li, gori zemja-ta.</i>
pass.by.PRS.3SG LI burn.PRS.3SG earth-DEF.SG.F
'Whenever/if (s)he walks by, the earth burns.' | (Koneski 1967: 539) |
| | b. <i>Što li najde vo nego?</i>
what LI find.PRS.3SG in 3SG.M.DAT.PRO
'Whatever did (s)he see in him?!' | (Rudin et al. 1999: 561) |
| | c. <i>Malini li se, kapini li se?</i>
raspberry.PL LI be.PRS.3PL blackberry.PL LI be.PRS.3PL
'Are they raspberries, or are they blackberries?' | (heard in conversation July 2018) |
| | d. <i>Tamu vetar-ot duva li duva!</i>
there wind-DEF.SG.M blow.PRS.3SG LI blow.PRS.3SG
'There the wind keeps blowing and blowing!' | (heard in conversation August 2019) |

³We use prosodic prominence, indicated with capitals, as the equivalent of *li* in the English translations. Though prosody also plays a role in Macedonian, we make no claims about it in this paper.

- f. *Musli e toa što saka-š?* Cleft Question (CleftQ)
 muesli be.PRS.3SG that what want-PRS.2SG
 ‘Is it muesli that you want?’
 (based on the examples in Rudin et al. 1999: 579)

In (1a) the polar question is neither marked by word order, which remains SVO, nor by any particle, but solely by intonation. In (1b) the word order remains canonical, but the question particle *dali* appears clause-initially. This is interpreted as a neutral question. Whenever *li* occurs, it always cliticizes to the first constituent of the clause; this constituent may only be preceded by a topic. In (1c) the first constituent is the fronted XP *musli*. In both (1d) and (1e) *li* attaches to the verb. In (1d) the object *musli* has been topicalized, making it appear before the verb. Finally, (1f) is a cleft question. It is unclear what the differences in usage between the questions in (1) are, though some suggestions, to be discussed in §2, have been made. To our knowledge, no empirical work on the usage of the different question types in colloquial language is available.⁴ In order to get a step closer towards both filling this empirical gap and gaining understanding of the meaning contribution of *li*, we present the findings of an empirical study that provide insights in the usage conditions of XP-LiQs, such as (1c). More precisely, we show that XP-LiQs are felicitous in contexts that trigger SURPRISE.

The structure of the paper is as follows. We discuss previous literature and formulate our hypotheses in §2. §3 and §4 serve to describe the methodology and results. In §5 we interpret our results and work towards an analysis. We conclude in §5.

2 Background and hypotheses

In this section we discuss previous approaches to XP-LiQs, leading us to formulate two hypotheses about the meaning contribution of *li*. We then elaborate on the semantic assumptions and predictions of both hypotheses.

Several suggestions on the pragmatic contribution of *li* have been put forward in the literature. First of all, Minova-Āurkova (1987) and Rudin et al. (1999) have reported that XP-LiQs are interpreted as rhetorical questions. Moreover, Rudin et al. (1999) have put forward that V-LiQs convey surprise. This observation is shared by Lazarova-Nikovska (2003: 137), who claims that *li* “adds a tone of surprise to the focused constituent” and shows this with a V-LiQ example. A third observation comes from Englund (1977), namely that XP-LiQs expect ‘no’ as an

⁴See Englund (1977) for a corpus study of literary works.

answer. In contrast, [Kramer \(1985\)](#), as cited in [Rudin et al. \(1999\)](#), has examples of IntQs, DaliQs and XP-LiQs being acceptable in the same situations. All three, for example, can be used when asking a shopkeeper if they have a certain product, suggesting that whatever difference there is between them is minimal. Finally, [Koneski \(1965\)](#), as cited in [Englund \(1977: 128\)](#), has noted that there is also regional variation, with *li* questions being more rare in Western dialects. Though our survey is concerned with Standard Macedonian, which is based on West Central dialects ([Friedman 2001](#)), most of our participants were from either Skopje, where West Central dialects are spoken, or Štip, where Eastern dialects are spoken (see §3.3).

While these suggestions have not been systematically explored, there is consensus in the literature that *li* is associated with FOCUS MARKING, as the constituent it is adjacent to is focus-fronted ([Tomić 1996](#); [Rudin et al. 1999](#); [Schwabe 2004](#); [Lazarova-Nikovska 2003](#)). The cited papers focus on the syntax and phonology of *li* and say little about its usage. The aim of this paper is to investigate the pragmatic effects of focus on polar questions.

It is widely accepted and agreed upon that the semantic and pragmatic effect of focus in declaratives is to generate a set of alternatives ([Rooth 1992](#)). The pragmatic contribution of focus in questions, such as (2), is less understood.

(2) Did JOHN play cards?

For questions, one possible analysis is that – employing QUESTIONS UNDER DISCUSSION (QUD, [Roberts 2012](#)) and DISCOURSE TREES ([Büring 2003](#)) – focus in questions indicates a sub-question in a discourse strategy ([Biezma 2009](#); [Kamali & Büring 2011](#)). This analysis will be elaborated on in §5.

The issue remains what motivation the speaker can have to make the sub-question explicit. We formulate two hypotheses which can be accounted for by a QUD analysis of focus in questions: that the speaker makes the sub-question explicit to indicate that what is denoted by the *li*-marked constituent is either unique, or that they are surprised about it. The hypotheses are given in (3).⁵

(3) a. Hypothesis 1:

XP-LiQs signal that there is a property (or entity) in our world which uniquely satisfies the property (or entity) that is denoted by the *li*-marked constituent (i.e. there is one unique value of the type of the *li*-marked constituent that will make the proposition that is denoted by the question true).

⁵We thank Radek Šimík for useful feedback on our definition of *uniqueness*.

b. Hypothesis 2:

XP-LiQs signal that the speaker is SURPRISED about the property (or entity) denoted by the *li*-marked constituent.

The motivation for these hypotheses is elaborated in the following two sections.

2.1 Hypothesis 1: ‘uniqueness’

The first hypothesis is that XP-LiQs signal that the property (or entity) that is denoted by the *li*-marked constituent is unique. A definition of uniqueness is given in (4).

- (4) UNIQUENESS: there is only one possible relevant $x_{\langle e \rangle}$ under discussion.

This is reminiscent of (pseudo-)cleft constructions, such as (1f), repeated here as (5), which, at least for English, are said to have a uniqueness presupposition (Drenhaus et al. 2011, among others).

- (5) *Musli e toa što saka-š?*
 muesli be.PRS.3SG that what want-PRS.2SG
 ‘Is it muesli that you want?’

Support for this hypothesis comes from Dukova-Zheleva’s (2010) analysis of focus in questions in Bulgarian. Bulgarian, being an Eastern South Slavic language, is closely related to Macedonian. Dukova-Zheleva (2010) claims that XP-LiQs contain a presupposition, as they involve a contrastive focus. An example to illustrate this is given in (6b).

- (6) a. *Scenario*: Paul, Ivan, Mary, Susan and Peter are students of history. Usually their final examinations are oral. Today they have an examination of this type. The teacher is in her office and asks them to enter one by one. The exam has just begun. Paul is in the teacher’s office, when Peter’s phone rings. In order to not disturb his classmates, Peter moves away to answer the call. A few minutes later he comes back, but he sees only Mary and Susan’s purse. He asks then if the one who has entered next is Ivan, thinking that Susan is probably somewhere else since she has left her things.
- b. *Ivan li vleze?*
 Ivan LI enter.PRS.3SG
 ‘Is Ivan the one who entered?’ (Bulgarian; Dukova-Zheleva 2010: 258)

The translation of (6b) as a cleft question in English is already hinting at a uniqueness interpretation. The context [Dukova-Zheleva \(2010\)](#) sets up for (6b) is such that only one person can be in the room at the same time, i.e., there is only one relevant person under discussion. The alternatives for (6b) are ‘Is Bill the one who entered?’, ‘Is Susan the one who entered?’, etc. Furthermore, translating sentences with *XP-li* as cleft questions is also employed by [King \(1994\)](#) for Russian.

2.2 Hypothesis 2: ‘surprise’

A second hypothesis for the effect of focus in *XP-LiQs* is that *XP-li* signals surprise rather than uniqueness. Motivations for this hypothesis are first of all the observations by [Rudin et al. \(1999\)](#) and [Lazarova-Nikovska \(2003\)](#) that, at least for *V-LiQs*, *li* adds a surprise flavor to a question, as mentioned in §2.

Furthermore, [Bianchi & Cruschina \(2016\)](#) and [Bianchi et al. \(2016\)](#) have found that in Sicilian, and several other languages, polar questions with a fronted focus can be interpreted as having a MIRATIVE IMPORT, i.e., that “there is at least one alternative proposition which is more likely than the asserted one” ([Bianchi & Cruschina 2016: 60](#)).

The definition of surprise we used in this experiment is a mismatch between a negative EPISTEMIC BIAS and a positive EVIDENTIAL BIAS. [Sudo 2013](#), building on [Büring & Gunlogson’s \(2000\)](#) concept of CONTEXTUAL EVIDENCE, proposes these two types of bias in order to account for certain Japanese biased question particles. Epistemic bias contains the expectations based on world knowledge and speakers’ beliefs, whereas evidential bias is contextual evidence gained from direct observations. An example to illustrate these concepts in English is given in (7).

- (7) a. Do athletes smoke?
- b. (NEGATIVE) EPISTEMIC BIAS: Athletes don’t smoke cigarettes.
- c. (POSITIVE) EVIDENTIAL BIAS: You see an athlete smoking a cigarette.

In order to find out which of these two hypotheses holds, we have set up a questionnaire, the details of which are shown in the next section.

3 Methodology

3.1 Design

We tested our hypotheses in a rating study. Two factors were manipulated. First, the form of the target question, which came in three conditions: XP-LiQ, DaliQ and CleftQ. The second factor was the context type, which also came in three conditions: Unique+Surprise, Non-unique+Surprise and Neutral.

27 experimental items were distributed in 7 lists with a Latin square design, together with 8 fillers that served as controls. Each trial consisted of a context and a question. Participants were asked to rate the naturalness of a question in a context on a 1 (min) – 5 (max) Likert scale. They were given two test trials before the actual trials. The survey was conducted online using SoSci Survey (Leiner 2014).

3.2 Stimuli

The stimuli were presented in written form in Macedonian Cyrillic.⁶ An example of a Unique+Surprise context is given in (8a).

- (8) a. UNIQUENESS + SURPRISE: Your friend bought a necklace with a precious stone. You don't recognize the stone, but you are sure it isn't ruby, because it is not red. Then your friend starts talking about how expensive ruby is. You ask her:
- b. *Rubin li ima vo gerdan-ot?* XP-LiQ
 ruby LI have.PRS.3SG in necklace-DEF.3SG.M
 'Is there RUBY in the necklace?'
- c. *Dali ima rubin vo gerdan-ot?* DaliQ
 Q have.PRS.3SG ruby in necklace-DEF.3SG.M
 'Is there ruby in the necklace?'
- d. *Rubin e toa što e vo gerdan-ot?* CleftQ
 ruby be.PRS.3SG that what be.PRS.3SG in necklace-DEF.3SG.M
 'Is it ruby that is in the necklace?'

In (8a) there is only one stone in the necklace, hence uniqueness. Surprise is present in the context because the speaker has an epistemic bias that there are no rubies in the necklace, when suddenly their friend mentions ruby in relation to the necklace, reflecting a positive evidential bias. This context was presented

⁶For practical purposes, we only make use of the Latin transliteration in this paper.

with either a XP-LiQ, as in (8b), a DaliQ, as in (8c) or a CleftQ, as in (8d). A Non-unique+Surprise context is given in (9), where the set-up for surprise is the same, but crucially, there are now multiple stones in the necklace and none of them is singled out by the context.

- (9) NON-UNIQUENESS + SURPRISE: Your friend bought a necklace with multiple precious stones, such as amethyst, sapphire, pink quartz and some more. You think it doesn't contain ruby, because none of the stones is red. Then your friend starts talking about how expensive ruby is. You ask her: [...]

(10) is an example of a neutral context, in which there is no set-up for surprise and there are multiple precious stones under discussion.

- (10) NEUTRAL: Your friend bought a necklace with multiple precious stones, such as amethyst, sapphire, pink quartz and some more. You ask her: [...]

As controls we used discourse-linked content questions, i.e., questions with 'which'. A good control is given in (11a) and a bad one in (11b).

- (11) a. GOOD CONTROL: You are at the market. There are multiple types of peppers at one stand. You ask: Which of these peppers are spicy?
b. BAD CONTROL: You are at a party and there aren't a lot of women there, only 5, and all of them are wearing blue lipstick. You ask your friend: Which of these women is wearing blue lipstick?

An additional file containing all the stimuli can be found under <https://osf.io/kednm>.

3.3 Participants

We tested 49 native speakers of Macedonian with a mean age of 38.4. The participants' regional and dialectal background is varied: There were 22 speakers of the central dialect (mostly from Skopje), 21 speakers from the eastern dialect (mostly from Štip), and 6 from other parts of the country. Two participants were living outside of North Macedonia at the time of the survey.

4 Results and discussion

4.1 Results

The overall findings are plotted in Figure 1.

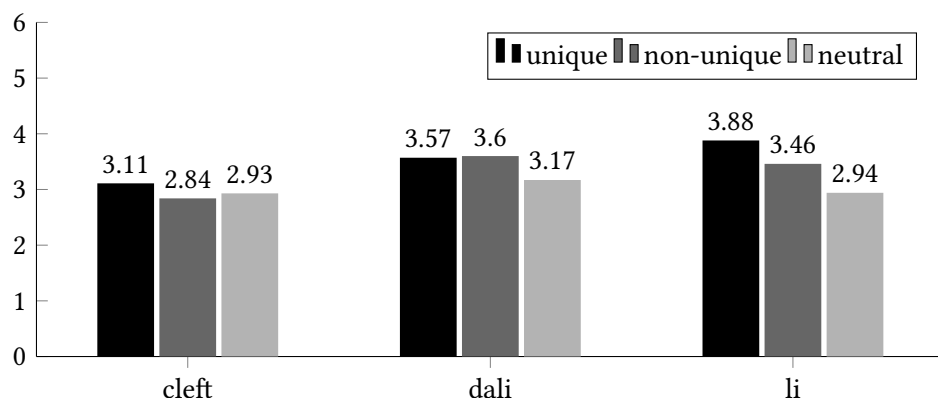


Figure 1: Overall ratings

The responses were analyzed with a mixed ANOVA, using the RStats package (R Core Team 2013). The factors were QUESTION TYPE (3 levels: XP-LiQ, DaliQ, CleftQ) and CONTEXT TYPE (3 levels: Unique+Surprise, Non-unique+Surprise and Neutral). The test revealed significant effects of QUESTION TYPE, CONTEXT TYPE, and the combination of QUESTION TYPE and CONTEXT TYPE. This lead us to follow up with pairwise comparisons (one-way ANOVA, again using RStats) between these factors, focussing on the drawn hypotheses. The comparison of *li* and *dali* in unique and non-unique contexts is plotted in Figure 2.

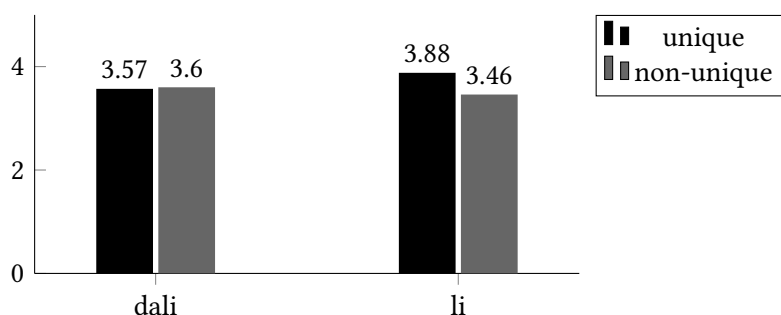


Figure 2: *li* v. *dali*

No significant differences between *li* and *dali* were found between unique or non-unique contexts. This suggests that uniqueness does not have an effect on the rating of the use of *li* or *dali* in a question.

In Figure 3 the results of the ratings of *li* questions in Unique+Surprise, Non-unique+Surprise and Neutral contexts are plotted.

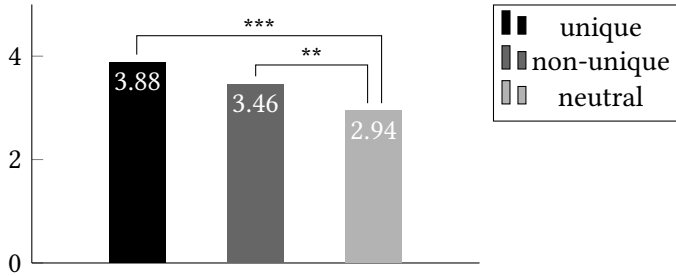


Figure 3: *li* across contexts

The results reveal that XP-LiQs get significantly higher ratings in surprise contexts. There is a significant difference between the ratings of XP-LiQs in Surprise+Unique contexts and Neutral contexts ($p < 0.005$), as well as between the ratings in Surprise+Non-unique contexts and Neutral contexts ($p < 0.05$). XP-LiQs get significantly higher ratings in surprise contexts across the board.

An anonymous reviewer pointed out to us that uniqueness seems to play a role in the licensing of *li*, because the significance of the effect is higher for Unique+Surprise than for Non-Unique+Surprise. As suggested by the same reviewer, we applied a two-factor ANOVA (using the RStats package) to the two relevant context types: Unique+Surprise and Non-Unique+Surprise. This test revealed no significant differences between the rankings of XP-LiQs and DaliQs in these contexts.

Finally, we did not find any significant differences between speakers of the different dialect groups. Because the sample size of this study was too small to draw conclusions from this result, we leave the issue of regional variation for future research.

4.2 Discussion

Let us turn to the implications of the data now and evaluate the results in the light of the drawn hypotheses.

First, consider hypothesis 1 in which we hypothesized that XP-LiQs signal that the property (or entity) that is denoted by the *li*-marked constituent is unique. If this is the case, we expect XP-LiQs to get better ratings in unique contexts, compared to non-unique contexts. We found no significant differences between the ratings of XP-LiQs in unique and non-unique contexts ($p = 0, 10$). Furthermore, hypothesis 1 predicts that DaliQs are rated better in non-unique contexts than XP-LiQs, which is not the case, as illustrated in Figure 1 ($p = 0, 50$). Finally, a two-factor ANOVA did not show an effect of uniqueness. We take this as evidence

against hypothesis 1. We do, however, acknowledge that the significance of the effect is higher for Unique+Surprise than for Non-Unique+Surprise. One could speculate that there is an interaction between the factors. At this point, we leave this for further research.

Secondly, let us turn to hypothesis 2 claiming a correlation between XP-LiQs and the speaker being surprised about the property (or entity) that is denoted by the *li*-marked constituent. This would predict better ratings for XP-LiQs in surprise contexts, both unique and non-unique, as compared to neutral contexts. This prediction is borne out: XP-LiQs got significantly better ratings in surprise than in neutral contexts. We take this to be a solid argument in favour of hypothesis 2.

5 General discussion

We now turn to the general implications of the results in §5.1 and follow the discussion up with open issues in §5.2. The nature of the discussion is exploratory, as it is beyond the aim of this paper to offer a full analysis of XP-LiQs. Specifically, we investigate the idea that the attested surprise effect is derived from general pragmatic principles as a result of focus marking, by the attachment of *li* to a constituent.

5.1 Discussion of hypothesis 2

At this point, a tempting route to explore the theoretical mechanism behind the ‘surprise’ hypothesis would be to analyze *li* as a mirative particle. It has long been known that there are languages, e.g. Japanese and languages from the Amazonia and Himalayas, that mark a surprised feeling using particles (Sudo 2013; DeLancey 2012). These particles are referred to as mirative particles. There are various definitions of mirativity available in the literature and it is beyond the scope of this paper to contribute to this debate. Having said that, there is consensus about the idea that mirative marking indicates that the expressed proposition is not part of the propositional content that the speaker has at her disposal, based on background knowledge or previous establishments of the truth of the proposition (DeLancey 2012; Donabédian 2001). We found that XP-LiQs are more felicitous in contexts where the speaker is surprised, suggesting it could be analyzed as a mirative particle.

We have two main arguments against analyzing *li* as a marker of mirativity. First of all, the particle *li* occurs in many Slavic languages and it has been analyzed as associating with focus in the languages in which it occurs (Schwabe

2004). While the usage of *li* is subject to variation – for example Bulgarian can have sentence-final *li* questions which are interpreted as neutral (Dukova-Zheleva 2010), while *li* in Czech is only found in conditionals (Schwabe 2004) – it would be remarkable if *li* were a plain surprise particle in one Slavic language and something else in a different one.

Secondly, if *li* were a mirativity marker, we would predict it to mark surprise across the board, including, for example, conditionals like (12).

- (12) *Mine li, gori zemja-ta.* habitual conditional
 pass.by.PRS.3SG LI burn.PRS.3SG earth-DEF.SG.F
 ‘Whenever/if (s)he walks by, the earth burns.’ (Koneski 1967: 539)

This prediction is not borne out, i.e., in (12), there is no surprise effect. As suggested by an anonymous reviewer, *li* being a focus marker, however, is compatible with (12), as the focus can generate the alternatives ‘(S)he passes’ and ‘(S)he doesn’t pass’, one of which is then picked as the condition for the apodosis.

Therefore, we explore an alternative explanation of our finding that surprise increases the felicity of XP-LiQs. Namely, that this is a result of a more general pragmatic principle.

As we pointed out in §2, traditionally, *li* has been analyzed as a focus particle in questions. Based on Meertens et al. (2018), who propose an analysis for the Turkish question particle *mI*, we take two ingredients from the literature, namely (i) the hierarchical organization of discourse in QUDs (Roberts 2012; Buring 2003) and (ii) focus (F-)marking (Rooth 1992). Roberts (2012) proposes that the shape of the QUD is determined by the placement of F-marking. Along the lines of Meertens et al. (2018), we propose that the placement of *li* determines the shape of the QUD. Let us first illustrate how such an analysis works and then turn to the surprise effect.

First, let us take discourse structure to consist of QUDs, which produces a set of hierarchically ordered questions, as in (4).

Secondly, we take Rooth’s (1992) analysis of focus. An utterance has an ordinary semantic value and a focus semantic value $\llbracket \phi \rrbracket^f$, consisting of a set of alternatives of the focus-marked element. An example is given in (13a). The notation $\llbracket \phi \rrbracket^f$ stands for the focus alternatives of ϕ and C stands for the semantically closest alternative. The felicity condition of the squiggle operator \sim is defined in (13b).

- (13) a. $\llbracket \text{Ali}_F \text{ played cards} \rrbracket^f =$
 {a played cards, b played cards, c played cards, ...}
 b. $\llbracket \phi \sim C \rrbracket$ is felicitous only if $\llbracket C \rrbracket \subseteq \llbracket \phi \rrbracket^f$

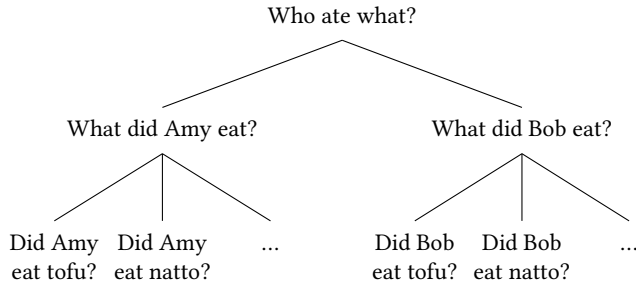


Figure 4: Give it a caption

We follow [Roberts \(2012\)](#) and [Biezma \(2009\)](#) and take the location of focus marking to constrain the shape of the immediate QUD. For the sentence *Did Amy eat tofu?*, for example, the placement of focus determines whether the immediate QUD is questioning the subject or the object of the utterance. Focus on the subject signals that the immediate QUD questions the subject, whereas focus on the object signals that the immediate QUD questions the object, as illustrated in [Figure 5](#) and [Figure 6](#).

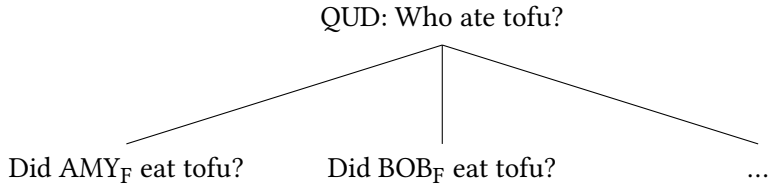


Figure 5: Caption needed

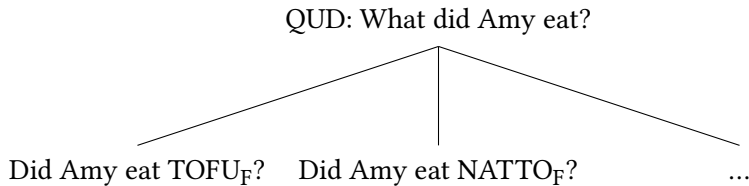


Figure 6: Caption needed

Now, if we take *li* to focus-mark the constituent it is adjacent to and thus to shape the QUD, certain predictions about the usage of focus in questions arise. It is expected that, for example, focus-marking the object (and thus indicating

that the immediate QUD is questioning it) gives a special status to that object, as compared to other constituents in the sentence. In other words, narrow focus in a question is particularly compatible with certain contexts, among which surprise, as Bianchi & Cruschina (2016) found for Italian and Italian dialects.

It should be noted that a QUD analysis predicts, in principle, that XP-LiQs are felicitous in any context in which the speaker has a reason to shape the QUD in a particular way. Let us briefly return to the results of our study. We listed the items that conveyed a feeling of INTEREST in a specific constituent, as in, for example, (14).

- (14) a. *Scenario*: Your sister has been watching the champions league final. It was Chelsea against Bayern München. You thought Bayern München would win, because they are a better team, but when you walk in the living room, your sister, wearing a Chelsea shirt, jumps up to hug you. You ask her:
- | | |
|-------------------------------------------------------|--------|
| b. Chelsea-LI won the Champions League? | XP-LiQ |
| c. Did Chelsea win the Champions League? | DaliQ |
| d. Is Chelsea the team that won the Champions League? | CleftQ |

In (14), one can imagine that on top of the discrepancy between epistemic and evidential bias, the speaker also has a great interest in the outcome of the game. A post-hoc analysis of those examples did not show a trend or significant effect of interest on the rankings of *li*. We leave this for further research.

Concluding this section, our finding is that the higher rating of XP-LiQs in surprise contexts as opposed to neutral ones is straightforwardly analyzed as the result of *li*'s function as a focus marker, its effect being the shaping of the QUD.

5.2 Open issues

In the remainder of our paper, we will discuss a number of open issues. The first issue is concerned with the various strategies of focus marking that Macedonian has access to. In this paper, we concentrated on focus marking by the placement of *li*. However, focus can also be marked by placing a focal accent on a constituent and by word order. It is far from clear what the interplay is between these strategies and a complete analysis of focus marking of Macedonian needs to take all three into account.

An additional open issue is the fact that in the experiment, we only tested contexts in which there is a bias conflict. Such contexts are very compatible with

a QUD that is shaped by narrow-focus marking. Recall that we interpreted these results as evidence for a focus account. Such an account also predicts licensing of *li* in contexts that are compatible with focus marking for other reasons, such as in (15) from Bianchi et al. (2016), in which the speaker is double checking the constituent she is focus-marking.

(15) *Scenario*: Peppe is an architect. Whenever he works in his office he comes home at 6 pm; whenever he has to go to the land registry office or the town hall instead, he comes home late.

A: Peppe came home late today.

B: Did he have to go to the TOWNHALL? (Bianchi et al. 2016)

At this point, intuitions about examples like (15) in Macedonian are unclear and the felicity of XP-LiQs in such a context needs to be tested empirically. We leave this issue for further research.

A final open issue is how polar questions with *li* attached to the verb, such as (1d) and (1e), rather than to an XP, are interpreted. While in Bulgarian, these can be interpreted as neutral questions (Rudin et al. 1999; Dukova-Zheleva 2010), in Macedonian the neutral way of forming questions is with *dali*, (1b), and the verb in V-LiQs is focused. *Dali*Qs in Bulgarian, on the other hand, are not neutral. As mentioned in §2, it has been reported that V-LiQs also seem to convey a feeling of surprise. Whether this focus produces the same type of bias as what we have shown here for XP-LiQs remains for further research.

6 Conclusion

We presented an empirical study the results of which show that XP-LiQs are felicitous in contexts where there is surprise of the speaker about the property or entity that is denoted by the constituent that *li* is attached to. The surprise was expressed in the contexts as a contrast between a negative epistemic and a positive evidential bias. We interpreted this result by proposing that this is a pragmatic effect of the focus marking done by *li*: it focuses that constituent and in that way shapes the QUD.

Abbreviations

1, 2, 3	first, second, third person	M	masculine
COP	copula	PL	plural
DEF	definite	PRS	present tense
F	feminine	Q	question particle
F	focus	SG	singular

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Chapter 6

Mirativity and the Bulgarian evidential system

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This paper provides an account of the Bulgarian admirative construction and its place within the Bulgarian evidential system based on (i) new observations on the morphological, temporal, and evidential properties of the admirative, (ii) a critical reexamination of existing approaches to the Bulgarian evidential system, and (iii) insights from a similar mirative construction in Spanish. I argue in particular that admirative sentences are assertions based on evidence of some sort (reportative, inferential, or direct) which are contrasted against the set of beliefs held by the speaker up to the point of receiving the evidence; the speaker's past beliefs entail a proposition that clashes with the assertion, triggering belief revision and resulting in a sense of surprise. I suggest an analysis of the admirative in terms of a mirative operator that captures the evidential, temporal, aspectual, and modal properties of the construction in a compositional fashion. The analysis suggests that although mirativity and evidentiality can be seen as separate semantic categories, the Bulgarian admirative represents a cross-linguistically relevant case of a mirative extension of evidential verbal forms.

Keywords: mirativity, evidentiality, fake past

1 Introduction

The Bulgarian evidential system is an ongoing topic of discussion both with respect to its interpretation and its morphological buildup. In this paper, I focus on the currently poorly understood admirative construction. The analysis I present is based on largely unacknowledged observations and data involving the morphological structure, the syntactic environment, and the evidential meaning of the admirative.



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Thus, it has largely remained unnoticed that the admirative (i) only allows for imperfect past participles which in admiratives receive a present tense interpretation, (ii) does not only encode direct evidence but may also be based on inferential and hearsay evidence, and (iii) is not only used in exclamatives but also in declaratives and is thus not tied to the exclamatory illocutionary force.

Based on these facts, I suggest an analysis of the admirative construction in terms of a semantic operator which captures the evidential, temporal, aspectual, and modal properties of the construction in a compositional fashion, combining insights from Bustamante's (2013) analysis of the mirative extension of the Spanish imperfect and Smirnova's (2011a; 2011b; 2013) analysis of the Bulgarian evidential. According to my analysis, admirative sentences are assertions based on evidence of some type (reportative, inferential, or direct) which are contrasted against the set of beliefs held by the speaker up to the point of receiving the evidence. The speaker's past beliefs entail a proposition which clashes with the assertion, triggering belief revision and resulting in a sense of surprise. The crucial idea adopted from Bustamante is related to the role of the tense and aspect morphology: the fact that the past tense morphology in admiratives is interpreted as referring to the present is accounted for by the assumption that tense is displaced and interpreted not within the assertion but under the admirative operator. The analysis distinguishes further between mirativity as a semantic category and exclamatory force as an illocutionary category and suggests that although mirativity and evidentiality can be seen as separate semantic categories, the Bulgarian admirative shows a cross-linguistically relevant case where evidential verbal forms acquire additional mirative meanings.

The paper is organized as follows. §2 provides some background on the Bulgarian evidential system, the notion of mirativity, and previous work on the Bulgarian admirative and outlines the main points of departure for my analysis of the admirative. In §3, I discuss data showing that the Bulgarian admirative differs from other related evidential categories in terms of its temporal, evidential, and modal properties. §4 presents my account of these properties in terms of their relation to the special morphology of the admirative construction based on Bustamante's analysis of the Spanish mirative and §5 discusses some consequences and residual issues related to the proposal.

2 The Bulgarian evidential system and the notion of mirativity

Traditionally, two different evidential paradigms are distinguished, morphologically and historically (see Andrejčin 1944; Aronson 1967) related to the present perfect, each encoding different evidential sources: the *renarrative* expressing reportative (1) and the *conclusive* expressing inferential (6) evidence (see, e.g., Bojadžiev et al. 1999; Pašov 1999; Nicolova 2008; and Jakobson 1971, who was among the first to call these forms evidential):¹

- (1) *Ivan rabotil* / *rabotel*.
 Ivan work.AOR.PTCP work.IPF.PTCP
 ‘Ivan worked/works, it is said.’
- (2) *Ivan e rabotil* / *rabotel*.
 Ivan is work.AOR.PTCP work.IPF.PTCP
 ‘Ivan has worked, I infer.’

This view, reflected in Table 1, is based on two assumptions: (i) the two evidential paradigms and the present perfect are formally composed of the present tense form of the auxiliary *săm* ‘be’ and a past *l*-participle that may be based on both imperfect and aorist stems, and (ii) the renarrative differs formally from the conclusive and the perfect in terms of auxiliary drop in the 3rd person singular and plural. In addition to the tense marking of the *l*-participles (aorist or imperfect),² the participle stems usually encode either perfective or imperfective verbal/lexical aspect (*vid na glagola*).³

¹“Inferential” refers both to inference from observable facts and from knowledge.

²Note however that some verbs – 3rd conjugation verbs as well as verbs like *znaja* ‘know’, *săm* ‘be’ – only have one past participle, see e.g. Nicolova (2017).

³See (i) and (ii) respectively. Note that there exist also verbs with a single form that can be both imperfective and perfective (biaspectual verbs; see, e.g., MacDonald & Markova 2010; Rivero & Slavkov 2014).

- (i) *Pisal* / *pišel* *săm*.
 write.AOR.IPFV write.IPF.IPFV am
 ‘I have written’ / ‘I have been writing’
- (ii) *Napisal* / *napišel* *săm*.
 write.AOR.PFV write.IPF.PFV am
 ‘I have finished writing’ / ‘I have been finishing writing’

Table 1: The traditional Bulgarian evidential forms and the present perfect of the verb *piša* ('write') in 1SG and 3SG

renarrative		conclusive		present perfect	
aorist	imperfect	aorist	imperfect	aorist	imperfect
pisal sâm	pišel sâm	pisal sâm	pišel sâm	pisal sâm	pišel sâm
pisal ∅	pišel ∅	pisal e	pišel e	pisal e	pišel e

Especially assumption (ii) above has been considered problematic, e.g. in work by *Gerdžikov* (1984), *Ivančev* (1988), *Levin-Steinmann* (2004), or *Sonnenhauser* (2013), where the different evidential forms are seen as belonging to one common paradigm (called PERFECT-LIKE COMPLEX; see *Ivančev* 1988), and the usage or omission of the 3rd person auxiliary (called AUXILIARY VARIATION) as guided by discourse-pragmatic factors such as the coding of the point of view of the narrator vs. some non-narrator (*Sonnenhauser* 2013; see also *Friedman* 1981; *Lindstedt* 1994; *Fielder* 1999). Formal semantic work, on the other hand, assumes a single evidential construction called PERFECT OF EVIDENTIALITY (*Izvorski* 1997) or THE EVIDENTIAL MORPHEME/MARKER (*Smirnova* 2011a,b; 2013; *Koev* 2017), formally uniquely characterized by a 3rd person auxiliary drop.

As far as the interpretation of the evidential forms is concerned, formal analyses range from their encoding (i) indirect (reportative, inferential) evidence (see *Izvorski* 1997), (ii) indirect or direct evidence depending on the context (see *Smirnova*), and (iii) not encoding evidence at all (see *Koev* 2017). Thus *Koev* argues that the evidential forms merely indicate a spatio-temporal distance between the event described by the sentence and the event of the speaker acquiring the evidence for his claim, from which the evidential meaning is pragmatically derived. *Smirnova*, on the other hand, assumes that the evidential encodes a temporal relation between the EVIDENCE ACQUISITION TIME (EAT) and the SPEECH TIME (ST) that, depending on context, is that of precedence (in reportative and inferential contexts) or coincidence (in direct contexts with exclamatory intonation), thus providing a formal account of the compatibility of the evidential forms with the expression of direct evidence.

In the grammatical tradition, uses of evidential forms in direct evidential contexts are dealt with by assuming a further evidential category or paradigm (see *Stankov* 1969) called the (AD)MIRATIVE, involving auxiliary drop in the 3rd person and expressing surprise over some suddenly discovered fact or event, see (3).⁴

⁴In addition, a fourth evidential category is sometimes assumed, the DUBITATIVE. It involves two

(3) *Ivan rabotel!*

Ivan work.IPF.PTCP

'Ivan works!'

First noticed by Weigand (1925), the status of the admirative is subject to continuing debate. While Weigand considers the admirative as a special use of the present perfect, others like Aleksova (2003) and Kim & Aleksova (2003) argue that the admirative is a special, expressive use of the conclusive that indicates a mismatch between what is expected based on inference and the actual state of affairs (see also Beševliev 1928; Ivančev 1976; Guentchéva 1990). On the other hand, Andrejčin (1938) views the admirative (which he calls “inopinativus”) as a special use of the renarrative forms serving the expression of facts unexpected for the speaker (see also Nicolova 1993; Bojadžiev et al. 1999; Hauge 1999). The semantics of the admirative is described in Nicolova (2013) more specifically in terms of asserting a state of affairs *p* and expressing surprise over *p*, where *p* is discovered immediately before the speech time and the surprise stems from the fact that the speaker’s previous knowledge implies not-*p* rather than *p* (see also Guentchéva 1990). Finally, while the evidential source indicated by the admirative is generally assumed to be direct, some authors (e.g. Aleksova 2001; Kim & Aleksova 2003; Simeonova 2015) argue that other evidential sources such as hearsay and inference may also be involved; see (4), where the admirative is felicitous in all three evidential contexts:

- (4) *Context:* Ivan thought that Stojan did not work. (i) direct evidence: Ivan sees Stojan working. (ii) inference: Ivan notices that the door to Stojan’s study is closed. (iii) hearsay: Petăr tells Ivan that Stojan is working. Ivan believes it and exclaims:

Toj rabotel!

he work.IPF.PTCP

'He works!'

(Simeonova 2015: 3; slightly modified)

Based on such evidence, Simeonova (2015) argues in favor of an account of the admirative in terms of mirativity, rather than in terms of evidentiality.

further forms of the auxiliary – present (*săm*) and the past participle (*bil*) – and auxiliary drop in the 3rd person. It expresses the speaker’s doubt with respect to the truth of some renarrated proposition, see, e.g., Bojadžiev et al. (1999); Pašov (1999). I assume for now that the dubitative is an additional interpretation of the renarrative in accordance with Bojadžiev et al. 1999 and do not deal with it in this paper.

In fact, mirativity as a semantic category encoding the speaker's surprise due to new and unexpected information has been argued to be independent from evidentiality since miratives do not make claims about the source of evidence for the proposition. Rather, this source may be of any kind: direct observation, inference, or hearsay (see, e.g., Jacobsen 1964; Watters 2002). Mirativity may be expressed by various grammatical forms (DeLancey 1997; 2001; 2012), next to other means such as lexicalized adverbials, conventionalized constructions (such as English *(It) turns out (that) S*), and intonation.⁵ Aikhenvald (2012) discusses cross-linguistic evidence for a number of grammatical categories, most prominently evidential forms, tense, and aspect that can acquire mirative meanings such as sudden realization, unexpected new information, and surprise. She refers to such extensions of non-mirative grammatical categories towards mirative interpretations in certain contexts as “mirative strategies”. Differences between evidentials and miratives include the observations that miratives have an assertive force, whereas evidentials typically do not, and that some mirative constructions are restricted with respect to particular tense and/or aspect forms or combinations of tense and aspect forms, whereas evidential constructions do not obey restrictions as to tense and aspect combinations (Aikhenvald 2012: 441). In spite of these differences, in a number of languages evidential forms such as non-firsthand evidentials or dedicated inferential and reportative evidentials acquire mirative “overtones” in certain contexts which can be strengthened by additional means such as particles and interjections (ibid.).

It seems that mirativity and evidentiality are closely intertwined also in the case of the Bulgarian admirative. Although the Bulgarian admirative does not make claims about a particular evidential source, as indicated by (4), it is formally related to the renarrative paradigm in that it involves auxiliary drop, and its tense and aspect morphology is restricted to particular forms and combinations, as will be shown in §3. Further evidence that will be provided in §3 shows that the Bulgarian admirative has assertive force and involves speaker commitment, while the renarrative does not, and differs from the conclusive both in terms of aspectual restrictions and auxiliary behavior. Moreover, I show that the admirative is not only used in exclamative but also in declarative sentences, a property of mirative constructions that has been attested crosslinguistically (see, e.g., Bustamante 2013). All these facts suggest that the Bulgarian admirative can be seen as a mirative extension of a specific combination of the verbal categories evidentiality, tense, and aspect.

⁵See also Bustamante (2013: 160) on the Spanish mirative verb *resultar* ‘turn out’, as well as Tatevosov & Maisak (1999: 290) on the Tsakhur mirative particle *jī* ‘it turns out that’.

Previous accounts of the admirative do not take these properties into consideration. This concerns first and foremost the aspectual restrictions of the admirative. Although Smirnova (2013: 505) argues that only the “present tense form of the indirect evidential” can yield a direct evidential interpretation, she does not account for this property in her analysis.⁶ On the contrary, Smirnova argues that the evidential stems do not encode aspectual difference but carry temporal information only. In addition, there is evidence that the much debated question of the aspectual properties of the imperfect and the aorist and their relation to the morphological opposition perfective/imperfective (see, e.g., Demina 1976; Sonnenhauser 2006) is highly relevant for the analysis of the Bulgarian evidential system in general and the admirative in particular.

Secondly, earlier accounts rely on the assumption that the admirative is tied to exclamatory mood. Thus, Aleksova (2003), Simeonova (2015), and Sonnenhauser (2015) treat all auxiliary-less evidential forms in exclamatives as admiratives.⁷ Similarly, Smirnova’s analysis of the interpretation of evidential forms in direct contexts relies on the assumption that the expression of direct evidence is related to exclamatory mood. Instead, I argue with Bustamante (2013) that a distinction must be made between mirativity as a semantic category encoded by various linguistic means (intonation, mirative predicates, verbal morphology) on the one hand and exclamations/exclamatives as illocutionary categories on the other: while both exclamations (declaratives with intonation marking exclamatory force) and exclamatives (special constructions with exclamatory force) can mark the speaker’s surprise due to unexpected information,⁸ there are several properties that distinguish them from mirative constructions in general, such as intonation pattern (which can both be falling and rising with miratives; see more details in Bustamante 2013: 152–153), force (declarative for miratives vs. exclamatory for exclamations/exclamatives), and embeddability under certain predicates. Moreover, while miratives indicate a clash with previous beliefs, exclamations/exclamatives express a general emotive attitude towards the proposition

⁶Moreover, describing the imperfect *l*-participles in the evidential forms in terms of “present tense forms” is not entirely correct, since, as will be shown in §3, the temporal contribution of the renarrative imperfect participles may, depending on the context, involve reference to the present or the past, due to the well-known syncretism between the participle forms for the present and the imperfect (e.g. *pišel sâm*), as well as present perfect and pluperfect (e.g. *bil sâm pišel*), and future perfect and past future perfect (e.g. *štjal sâm da sâm pišel*); see Andrejčin (1944: 266). This syncretism has been dealt with both in terms of homonymy (e.g. Andrejčin 1944) and polysemy or ambiguity (e.g. Demina 1959).

⁷See also Guentchéva (2017) who argues that admirative constructions are marked by exclamatory intonation and indicate discrepancy between what is expected and what is observed.

⁸Rett (2011) points out that exclamations and mirativity markers both refer to speaker expectations.

(surprise, admiration, amazement), which is demonstrated by the acceptability of exclamations in contexts in which the speaker already believes the information expressed but is exclaiming in order to point it out, such as *You overslept again! Which was also to be expected.* (Bustamante 2013: 149, 154–155). In contrast, miratives are not felicitous in contexts in which the speaker already knows or believes the information and are thus assertions expressing that the speaker has just discovered something unexpected, as will also be shown for the Bulgarian admirative. This property indicates that miratives are modalized propositions rather than a kind of speech act (Bustamante 2013: 159).

In addition to disregarding the use of admiratives in declarative sentences, Smirnova's account of the use of evidential forms in contexts of direct evidence is further inadequate because it is based on an operator EXCL which has no illocutionary semantics but is specifically designed to fix the desired temporal relation between the evidence acquisition time EAT and the speech time ST, which in direct evidence contexts is that of coincidence ($EAT = ST$) and in indirect evidence contexts one of precedence ($EAT < ST$).⁹ But even genuine illocutionary operators (such as E-FORCE in Rett 2011: 429) are unable to account for the relation between the morphological form and the semantic properties of the admirative that will be discussed in §3 and that distinguish the admirative from exclamatory uses of the other two evidential forms, the renarrative and the conclusive.

Finally, considering the Bulgarian evidential system as a whole, the assumption of a single evidential morpheme expressing various evidential sources is a simplification that does not account for the actual usage of the Bulgarian evidential forms. As will be shown in §3, it is far from settled that the conclusive involves auxiliary drop. The fact that the admirative is restricted with respect to the form of the *l*-participle militates against such a view as well. In addition, formal analyses like Izvorski (1997) and Koev (2017) are unable to accommodate the admirative since they are not compatible with direct evidence: Izvorski's analysis relies exclusively on indirect evidence and Koev's analysis on spatio-temporal distance between EAT and the event, which is not true for direct evidence. The auxiliary variation hypothesis is not tenable either once the admirative enters the picture: an explanation in terms of pragmatic effects related to points of view would falsely predict that the auxiliary-less admirative forms are tied to a non-narrator.

In the next section, I provide evidence for the properties of the Bulgarian admirative discussed above which strongly suggests an analysis in terms of a mirative

⁹In addition, applying Smirnova's analysis to admiratives in declarative sentences would falsely tie the admirative to indirect evidence, as the illocutionary operator DECL she defines would lead to an indirect evidence interpretation.

extension of evidential verbal forms.

3 The Bulgarian admirative

The Bulgarian admirative differs from renarrative and conclusive evidentials in a number of morphological and semantic properties:

- While the admirative (which may, similar to the conclusive, be based on inferential evidence) always involves auxiliary drop, the auxiliary of the conclusive may be omitted under certain conditions that will be discussed below.
- Whereas renarrative and conclusive evidentials both use aorist and imperfect participles, the forms of the admirative are restricted to imperfect participles.
- The admirative is not only used in exclamations but also in declarative sentences with declarative illocutionary force.
- While the admirative expresses speaker commitment to the underlying proposition, the renarrative is underspecified in this respect.¹⁰
- Whereas in the case of the admirative the past morphology expresses reference to present events, the temporal interpretation of the renarrative may vary between past and present depending on participle type and context.
- Admirative sentences are always related to a clash of beliefs, whereas renarrative and conclusive evidentials (and the present perfect for that matter) used in exclamations may express a wider range of emotive attitudes next to (or beyond) surprise.

3.1 Admiratives based on inferential evidence and conclusives with and without auxiliary

Formal research on the Bulgarian evidential system is based on the assumption that the conclusive involves auxiliary drop and is thus formally indistinguishable from the renarrative and the admirative. While *Izvorski (1997)* and *Koev (2017)*

¹⁰I do not exclude though that the renarrative expresses the commitment of the reporter towards the reported proposition; see also *Smirnova (2011a; 2013)*.

adopt a single-morpheme assumption without discussing any data or the possibility of auxiliary variation,¹¹ Smirnova's (2011a; 2011b; 2013) analysis of the evidential is based on data which partly runs against native speakers' intuitions. Thus, examples like (5), intended to demonstrate the use of the auxiliary-less evidential form in inferential contexts, were rejected by all 11 informants in a small-scale acceptability judgement task in favor of an alternative form (imperfect or aorist participle) containing the auxiliary; see (6) and (7).¹²

- (5) *Inferential context*: Your late aunt Maria spent the last months of her life in Paris. No one knows why. After the funeral, you found a first chapter of an unauthored manuscript about Paris in Maria's papers. You inferred that Maria was writing a book. When one of the relatives asks you how Maria spent the last months of her life, you say:

Maria pisala kniga.

Maria write.AOR.PTCP.IPFV book

'Maria was writing a book, [I inferred].' (Smirnova 2013: 497; my glosses)

- (6) *Maria e pisala kniga.*

Maria is write.AOR.PTCP.IPFV book

'Maria was writing a book, [I inferred].'

- (7) *Maria e pišela kniga.*

Maria is write.IPF.PTCP.IPFV book

'Maria was writing a book, [I inferred].'

¹¹Koev (2017: 3, fn. 2) mentions that "the use of evidential forms in inferential contexts is somewhat more restricted than their use in reportative contexts", possibly due to dialectal variation, however without elaborating on any evidence for this contrast. In fact, no data on this topic can be found in what may be considered the main work on Bulgarian dialectology, Stojkov (2002). Izvorski (1997), on the other hand, seems to assume that evidential forms that retain the auxiliary in the 3rd person are ambiguous between the conclusive and the present perfect.

¹²The survey involved 11 native speakers born and living in Sofia, 3 male, 8 female, aged between 20 and 80, 10 of them university graduates, 1 high-school graduate. The survey was designed as a forced-choice task, with 5 alternatives to choose from for the target utterance: the verb in its indicative present form, aorist participle with auxiliary, aorist participle without auxiliary, imperfect participle with and imperfect participle without auxiliary. As a reviewer pointed out to me, the fact that the participants could not choose more than one answer could have obscured cases where the version with the auxiliary was possible but less preferred. Still, the survey shows that the preferred forms are the ones containing the auxiliary.

For two of the items – Smirnova (2013: 480, (3) and 498, (35)) – 6 informants preferred the original auxiliary-less version. Looking closer at the contexts of the examples, however, they seem to be ambiguous between inferential, renarrative, and admirative interpretations. Thus, while Smirnova's example (3) describes a situation in which the speaker spontaneously informs her husband of a new surprising fact she just has discovered and thus allows for an admirative interpretation, example (35) draws on evidence from a calendar entry of the person the speaker talks about, which can be interpreted as a second-hand evidential source licensing auxiliary-less renarrative forms.

These observations show not only that the usage of Bulgarian evidential forms is highly sensitive to context, but also that evidential forms in inferential contexts are not necessarily auxiliary-less and are at least in those cases formally distinguishable from admiratives based on inferential evidence.¹³

At the same time, it seems that the acceptance of auxiliary-less conclusives may not merely be influenced by context but related to some aspectual properties of the evidential form. Thus it seems that the auxiliary may be omitted when the *l*-participle is based on the aorist form of a perfective verb (or a verb like *sām* 'be' which is underspecified with respect to aspectual distinctions), while the temporal interpretation of the form remains the same in both versions:

- (8) *Context*: Ivan, looking at his watch:

To (e) stanalo večē mnogo kāsno.
 it is become.AOR.PTCP.PFV already very late
 'It has already become very late.'

For comparison, the insertion of the auxiliary into an admirative sentence changes the temporal interpretation from present to past and renders the sentence infelicitous in the mirative context:

- (9) *Inferential mirative context*: Ivan thought that Stojan was not working, but then he notices that the light in Stojan's study is on and exclaims:

Stojan rabotel! / #Stojan e rabotel!
 Stojan work.IPF.PTCP.IPFV Stojan is work.IPF.PTCP.IPFV
 'Stojan is working!' / Stojan has been working!'

What seems to distinguish the two versions in (8) is what can be described as the emotional intensity of the utterance which is greater without the auxiliary. This effect is neutralized when the conclusive is used in an exclamation:

¹³Of course, one could say that the auxiliary-less forms are the "real" evidential forms, whereas the ones retaining the auxiliary are forms of the present perfect with a similar conclusive meaning, as Izvorski (1997) seems to suggest.

- (10) *Ja go viž ti, kakvo (e) namislil starijat đjaval!*
 well he.ACC look.IMP you what is plotted.AOR.PTCP.PFV old.DEF devil
 (Levin-Steinmann 2004: 150)
 ‘Look what he has plotted, the old devil!’

In contrast, the auxiliary-less evidential form in (5) which is considered problematic by my informants is based on an imperfective aorist participle. This indicates that this aspectual combination may be less acceptable without the auxiliary in non-mirative inferential contexts than an aorist perfective participle.¹⁴ Clarifying the morphological status of the conclusive goes, however, beyond the scope of the present study and must be left for future work. For my current purposes, it suffices to conclude that admiratives differ formally from conclusives in terms of both aspectual properties and auxiliary behavior.

3.2 Admiratives and declaratives

As already pointed out, mirative constructions are not tied to exclamatory illocutionary force crosslinguistically. This applies to the Bulgarian admirative as well. As the examples below show, sentences containing admirative forms with auxiliary drop and imperfect past participles with present tense interpretation can be used in declarative sentences with non-exclamative, declarative intonation, where they express commitment to the asserted proposition as well as a clash between the proposition and the speaker’s past beliefs.

- (11) *Ne bjah prava, kogato pisah, če Košlukov ne raboti. To se*
 NEG was right when wrote that Košlukov NEG work.PRS it REFL
okaza ošte po-lošo – toj rabotel.
 turned.out more worse he work.IPF.PTCP
 ‘I was not right when I wrote that Košlukov wasn’t working. It turned out to be worse – he obviously IS working.’

In (11), the admirative sentence is semantically embedded under the mirative predicate *okazva se* ‘it turns out’ which already makes the mirative meaning of the admirative sentence salient: the speaker indicates that, prior to the discovery of facts suggesting the opposite, her belief base contained the proposition

¹⁴See also Levin-Steinmann (2004: 33) who discusses an auxiliary-less “reduced perfect” ascertaining the existence of some state and mainly involving the perfective aspect.

“Košlukov is not working”.¹⁵ Since the admirative sentence asserts that Košlukov is working, it suggests that the speaker’s belief base has been revised as a result of receiving some evidence. The evidence which causes the belief clash may be of any kind: reported, inferred, or directly observed. Note that neither the presence nor the form (past aorist) of the mirative predicate *okaza se* have an impact on the mirative interpretation: it does not change if *okaza se* is dropped. A sequence of tenses effect can be excluded here since neither the interpretation nor the acceptability of the sentence change when the predicate of the admirative sentence is set to present tense (*raboti* ‘works’). A past generic reading can also be excluded, since this reading requires the use of the auxiliary.

A close example is (12) where the admirative is used in a belief revision context similar to the one in (11). This example stems from Andrejčin (1938: 68) and is used to illustrate what he calls the “inopinative” use of the forms of the renarrative for the purpose of expressing facts unexpected to the speaker.

- (12) *Misleh, če e zlato, a to ne bilo.*
 think.1SG.IPF that be.3SG.PRS gold, but it NEG be.IPF/AOR.PTCP
 ‘I thought it was gold, but it isn’t.’

Here, the assertion of the admirative sentence that the object in question is not made of gold is contrasted with an earlier opposite belief of the speaker embedded under the epistemic predicate *mislja* ‘believe’ in the past (imperfect) tense. The evidence that causes the belief change may again be of any sort: direct observation, but also inference or hearsay. Note that the verb *sām* ‘be’ belongs to the rather small group of verbs which do not have different participle forms for the imperfect and the aorist. However, a similar example can be constructed where it can be shown that only the imperfect form is appropriate in such contexts:

- (13) *Misleh, če raboti, a toj ne rabotel / *rabotil.*
 think.1SG.IPF that work.3SG.PRS but he NEG work.IPF.PTCP AOR.PTCP
 ‘I thought he was working, but he isn’t.’

¹⁵Entire example: *Ne bjah prava, kogato pisah, če programnijat direktor v BNT Emil Košlukov ne raboti, zaštoto godinata veče si teče, a vse ošte njama programna shema. To se okaza ošte pološo – toj rabotel. I kato ne moža da “izraboti” dobroto predavane “Denjat započva s kultura”, kompensira s drugi dve predavanija.* ‘I was not right when I wrote that the program director of the Bulgarian National Television Emil Košlukov wasn’t working, since the year has already begun and yet no program plan exists. It turned out to be worse – he obviously IS working. And since he did not manage to ruin the good show ‘The day begins with culture’, he did it to two other shows instead.’ (<http://e-vestnik.bg/27704/>)

Moreover, a past tense interpretation is only achieved by putting not only the embedded verb in the present perfect, but also its second occurrence, which requires the use of the auxiliary; see (14).

- (14) *Misleh, če e rabotel / rabotil, a toj ne*
think.1SG.IPF that be.3SG.PRS work.IPF.PTCP AOR.PTCP, but he NEG
*(e) *rabotel / rabotil.*
 be.3SG.PRS work.IPF.PTCP AOR.PTCP
 ‘I thought he was/has been working, but he was not/has not been
 working.’

Here, the sentence suggests that the belief revision has occurred further back in the past and does not have any bearing on the present. In order for a construction to express mirativity, the evidence causing the belief revision must have been acquired recently and have bearing on the present.¹⁶

3.3 Admiratives and renarratives in exclamations

As already pointed out in §2, most researchers assume that admirative forms and/or mirative interpretations are only licensed when the forms are used in exclamative sentences. I showed in the previous section that this assumption does not correspond to the linguistic facts. In this section, I argue that it is possible to distinguish between admirative forms having mirative (i.e. clash of beliefs) interpretations, on the one hand, and uses of renarrative forms with renarrative semantics used in exclamations where they indicate surprise or other emotive attitudes, on the other. I pointed earlier at evidence suggesting that mirative constructions differ from exclamations/exclamatives with regard to a number of properties. Thus, exclamatory force is not merely related to surprise in terms of clash of beliefs but covers a wider range of emotive attitudes. Consequently, a renarrative form used in an exclamation or exclamative should be expected to have a greater range of meanings than surprise. Another difference is that while the admirative forms (imperfect evidential forms with auxiliary drop and present tense interpretation) indicate that the speaker is committed to the proposition expressed, exclamative renarratives do not necessarily express such a commitment. Finally, whereas imperfect renarrative forms in exclamative sentences are ambiguous between present and past interpretation, imperfect admirative forms

¹⁶See also Rett & Murray’s (2013) RECENCY RESTRICTION according to which “mirative interpretations are only available relatively recently after the speaker’s learning that *p*.” (Rett & Murray 2013: 464).

receive only a present interpretation. Consider (15) where the context only allows the imperfect participle.

- (15) *Context:* Ivan thought that Stojan was not working. (i) direct evidence: Ivan sees Stojan working. (ii) inference: Ivan notices that the door to Stojan's study is closed. (iii) hearsay: Petăr tells Ivan that Stojan is working. Ivan believes it and exclaims:

Toj rabotel / **rabotil!* #*Tova ne e vjarno.* / #*Tova se očkvaše.*
 he work.IPF.PTCP AOR.PTCP this NEG is true this REFL expected
 'He is working! This is not true. / This was to be expected.'

The temporal interpretation of the form in this context is not past but present. In order to get a past interpretation, it is not only necessary to adjust the context (Petăr tells Ivan that Stojan was/has been working), but also the auxiliary must be used, which changes the admirative into a conclusive (or present perfect) sentence with exclamatory intonation.¹⁷

In addition, the admirative sentence cannot be continued by an utterance like "This is not true", which indicates that the speaker is committed to the information expressed, nor by a sentence like "This was to be expected", which indicates that the speaker's beliefs prior to receiving the evidence have been revised to accommodate the new information. Now consider the case of the exclamative use of the renarrative in (16). Here, depending on the tense used in the report, the imperfect participle may refer to a present or past eventuality.¹⁸ In addition, the exclamative renarrative may express not only surprise and thus commitment to the content uttered but alternatively disbelief ("This is not true!") or some emotive attitude other than surprise ("This was to be expected").

- (16) *Context:* Petăr tells Ivan that Stojan is/was working. Ivan exclaims:

¹⁷The example would be modified as follows:

- (i) *Context:* Ivan thought that Stojan was not working. (i) direct evidence (not possible). (ii) inference: Ivan notices a pile of newly printed paper on Stojan's desk. (iii) Petăr tells Ivan that Stojan was working. Ivan believes it and exclaims:

Toj e rabotel / *rabotil!*
 he is work.IPF.PTCP AOR.PTCP
 'He was/has been working!'

¹⁸In this case, the tense forms in the report can be *rabóti* (present tense), *rabóteše* (imperfect), or *rabotí* (aorist).

Toj rabotel! Kakva iznenada! / Tova ne e vjarno! / Tova se
 he work.IPF.PTCP what surprise this NEG is true this REFL
očakvaše!
 expected
 ‘He is/was working! What a surprise! / This is not true! / This was to be expected!’

Also the aorist participle can be used within an exclamative renarrative, as shown in (17). Here, however, the aorist participle unambiguously shows that the report on which the evidence is based refers to a past eventuality. Apart from this, the observations from the imperfect participle case hold: the attitude expressed may be surprise (and thus commitment), disbelief, or some other emotive attitude:

(17) *Context:* Petăr tells Ivan that Stojan worked (yesterday). Ivan exclaims:

Toj rabotil! Kakva iznenada! / Tova ne e vjarno! / Tova se
 he work.AOR.PTCP what surprise this NEG is true this REFL
očakvaše!
 expected
 ‘He worked! What a surprise! / This is not true! / This was to be expected!’

The different behavior of the imperfect participle forms in the case of the admirative as compared to the renarrative shows that a simple explanation in terms of a mere ambiguity of forms does not suffice, and an account of the admirative needs to capture these facts. Furthermore, it was shown in (16) and (17) that the speaker may use renarrative forms even though she does not believe the reported information, or when she already believes that the proposition is true. This contradicts earlier accounts like Smirnova (2013) and Koev (2017). Thus, Smirnova argues that her evidential operator *Ev* has a modal component because *Ev* is infelicitous in reportative contexts when the speaker knows that the proposition *p* is true or when the speaker knows that *p* is false.¹⁹ However, she does not consider renarratives used in exclamatives. Contrary to Smirnova, Koev argues that the evidential commits the speaker to *p*, explaining dubitative cases in terms of pragmatic weakening through perspective shift (see Koev 2017: 20–25). As shown in the above examples, renarrative forms used in exclamations do not require a

¹⁹Smirnova assumes more specifically that in inferential and direct evidential contexts the speaker must be committed to the truth of *p*, where the commitment is weaker than in non-modals.

perspective shift in order to be interpreted as non-committing, nor are they infelicitous in contexts where the speaker already knows that *p* is false. Moreover, it can be shown that also in declaratives, the renarrative is felicitous in contexts where *p* is considered false and where no perspective shift is suggested. Thus, the renarrative can be embedded under the predicate *znaja* ‘know’ with the sole interpretation that the speaker knows of the existence of the claim made by some reporter, either without taking a stance as to the truth of the claim, or in a context in which the speaker knows that the reported proposition is false, as shown by the felicitous continuations of the renarrative sentence in (18). If the speaker knows that a reported proposition is true, the renarrative is indeed infelicitous and an indicative form must be used.

- (18) *Znaja, če Petăr pušel. No ne znam dali naistina*
 know.1SG.PRS that Petăr smoke.IPF.PTCP but NEG know if really
puši. / No toj vǎobšte ne puši.
 smoke.3SG.PRS but he at all NEG smoke.3SG.PRS
 ‘I know that it is claimed that Petăr smokes/smoked. But I don’t know if
 he really does. / But he doesn’t smoke at all.’

Similarly, if the renarrative is embedded under the negation of the predicate *znaja* ‘know’ in its past tense form, the only possible interpretation is that the speaker didn’t know about the existence of such a claim made by some reporter. At the same time, the sentence is felicitous when the speaker is ignorant with respect to the truth of *p* or when she knows that *p* is false.

- (19) *Ne znaeh, če Petăr pušel. Az lično njamam*
 NEG know.1SG.AOR that Petăr smoke.IPF.PTCP I personally do.not.have
predstava dali puši / e pušil ili ne. / Az lično
 idea if smoke.3SG.PRS is smoke.AOR.PTCP OR NEG I personally
znam, če ne puši / ne e pušil.
 know that NEG smoke.3SG.PRS NEG is smoke.AOR.PTCP
 ‘I didn’t know that Petăr supposedly smokes/smoked. I personally have
 no idea if he does/did or not. / I personally know that he doesn’t/didn’t
 smoke.’

Renarratives behave the same way in exclamatory sentences: they are felicitous both in contexts in which the speaker believes the reported information and is surprised, as in (20) which can be continued by an utterance like ‘Can you imagine, this lazy guy!’, and in contexts like (21) where the speaker is rather outraged

by a claim she knows doesn't correspond to the truth and where the sentence with the renarrative can be continued by an utterance like 'What a lie!'.

- (20) *Context:* A learns from B that Ivan worked the previous day which happens to be a Sunday. A is surprised over this fact (+BELIEF CLASH, +COMMITMENT) and later tells C:

Ivan rabotil včera!
Ivan work.AOR.PTCP yesterday
'Ivan worked yesterday!'

- (21) *Context:* A learns from B that Ivan worked the previous day. A does not believe it because she knows the truth but finds the commitment of the reporter B surprising (−BELIEF CLASH, −COMMITMENT) and later tells C:

Ivan rabotil včera!
Ivan work.AOR.PTCP yesterday
'Ivan worked yesterday!'

These uses of the Bulgarian renarrative evidential form suggest that it merely indicates that the speaker has hearsay evidence for *p*, without committing the speaker to its truth.²⁰

Table 2 summarizes the findings in this section.²¹

Table 2: Properties of the admirative by comparison

	auxiliary	participle		evidential source			speaker	belief	time	reference
		AOR	IPF	report	infer.	dir.	commitment	clash	present	past
renarr.	−	+	+	+	−	−	−	−	+	+
concl.	+/−	+	+	−	+	−	+	−	?	+
admir.	−	−	+	+	+	+	+	+	+	−

²⁰ Additional evidence that needs to be examined is that there is a slight difference in intonation pattern, as also observed in Bustamante (2013: 152–153) for the Spanish mirative as compared to Spanish exclamations: L or H-L in admiratives, H in exclamations.

²¹ Since auxiliary-less conclusives are difficult to distinguish from inference-based admiratives, I leave the question open whether the former may express reference to the present.

4 The admirative operator

In this section, I account for the properties of the Bulgarian admirative discussed in the preceding section in terms of the modal evidential operator $\text{ADMIR}(p)$ which captures the following facts:

1. The proposition p is asserted, the speaker is committed to the truth of p .
2. p is based on evidence of some sort (direct, inferential, reportative).
3. p clashes with the speaker's beliefs up to the point of getting the evidence.
4. The asserted eventuality is ongoing at speech time.
5. The evidence acquisition time immediately precedes or coincides with the speech time.

To this end, I adopt [Bustamante's \(2013\)](#) analysis of a Spanish mirative construction that involves past imperfect morphology as in (22).²² Here, the past imperfect does not have its usual temporal meaning expressing reference to a past eventuality but refers to a present eventuality and expresses that p clashes with the speaker's previous beliefs. In addition, this use of the past imperfect indicates that the speaker is committed to p and is felicitous in both direct and inferential evidential contexts.

(22) *Juan fum-aba.*

Juan smoke-PAST.IPFV.3SG

'Juan smokes!'

(Spanish, [Bustamante 2013: 34](#))

Examples like this are taken to suggest that the mirative use of the past imperfective involves "a shifting of time reference for the eventuality described in the proposition, leaving the past as 'fake'", while the (imperfective) aspect retains its usual interpretation ([Bustamante 2013: 6](#)). [Bustamante](#) interprets such cases of 'fake' past interpretations of past tense morphology and imperfective aspectual morphology as an example of mirative extension of the imperfect (and pluperfect) tense in Spanish.

In contrast to approaches to fake past morphology such as [Iatridou \(2000\)](#), [Bustamante](#) does not assign a special semantics to this past tense but assumes a regular meaning in terms of [Kratzer \(1998: 10\)](#).²³ The crucial assumption concerns the

²²The glosses are as in the original example.

²³ $\llbracket \text{past} \rrbracket^{g,c}$ is only defined if c provides an interval t that precedes t_0 . If defined, then $\llbracket \text{past} \rrbracket^{g,c} = t$. This definition corresponds to the neo-Reichenbachian past defined in terms of a relation between reference time and speech time ($RT < ST$); see, e.g., [Klein \(1994\)](#).

locus of interpretation of the past tense morpheme which seems displaced, since it does not contribute its temporal meaning to the proposition: instead of it being interpreted in TP (the domain of the assertion), the feature [past] is interpreted in CP, which is the domain of the mirative operator.

The second crucial assumption is that the main contribution of the mirative operator is to relate the assertion to the speaker's beliefs prior to the discovery of facts leading to the assertion where the newly discovered facts are such that they clash with the past beliefs. The speaker's past beliefs are introduced by the mirative operator M_{op} , the first argument of which is a modal base representing the locus at which the displaced [past] feature is interpreted (Bustamante 2013: 12): The modal base has a time argument that is saturated by the displaced [past] feature, which results in a representation of the speaker's past beliefs holding in an interval that precedes the utterance time, where the utterance time usually coincides with the "discovery time", i.e. the time at which the evidence is received (Bustamante 2013: 12–13).

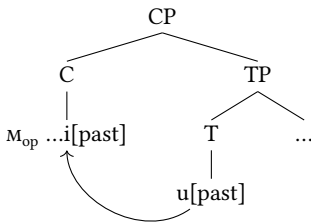
The syntactic assumptions capturing the displacement of the tense morpheme include a feature-checking relationship between interpretable features of functional projections that need to be checked against the corresponding uninterpretable features of lexical projections (via Agree, following Chomsky 2000; 2001; see details in Bustamante 2013: Ch. 3). In miratives, the tense feature is displaced such that T (or V) bears the morphologically realized but uninterpretable $u[past]$ feature, whereas C bears the interpretable $i[past]$ feature.²⁴ In addition, Bustamante (2013: 50–51) assumes the structure in Figure 1, where "VP denotes a property of events and combines with Aspect to yield a property of times (AspectP)", and Tense combines with AspectP and yields a proposition (TP).

The modal mirative operator M_{op} is defined below, where P represents the set of the speaker's beliefs and Q represents the assertion:

$$(23) \quad M_{OP} = \lambda P \lambda Q \lambda t_1 \lambda w_1 [[P(w_1)(t_1) \subseteq \lambda w \neg Q(w)(t_1)] \wedge Q(w_1)(t_1)]$$

(Bustamante 2013: 54)

²⁴See Bustamante (2013: 38):



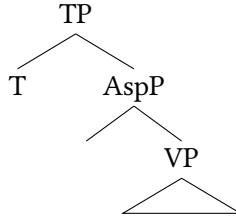


Figure 1: Tense and aspect in the TP (Bustamante 2013: 51)

The appropriate modal base is provided by the accessibility relation R defined below, where R takes as its first argument the time t and is thus restricted by a time of evaluation:²⁵

$$(24) \quad R = \lambda t \lambda w \lambda w' [w' \text{ is compatible with speaker's beliefs in } w \text{ at } t]$$

The derivation of the mirative meaning under the assumption of the displaced tense feature $i[\text{past}]$ and the mirative operator m_{op} applied to the assertion (TP) is shown in Figure 2 and Figure 3 below.²⁶

In Figure 2, R is applied to the displaced past feature $i[\text{past}]$, yielding the first argument of m_{op} , the set of the speaker's past beliefs P , i.e. the beliefs holding at an interval up to the speech time. Then, the m -operator is applied to the assertion (TP), which gets a present reading: the tense feature $u[\text{past}]$ in T is uninterpretable (see Figure 3), i.e. no interpretation of the feature takes place at this point, and the denotation of $AspP$ percolates to TP . There, m_{op} is applied to the assertion, the time argument of which is bound by λt_1 in (23) and gets the value of the speech time.²⁷ Hence, the content of the mirative sentence, the proposition Q , gets interpreted “in the present and with respect to the actual world”, i.e. the speaker believes the proposition to be true at speech time (Bustamante 2013:

²⁵The idea to impose a temporal restriction on the accessibility relation is adopted from Ippolito's (2002) approach to counterfactuals and accounts for the fact that beliefs change over time.

²⁶Bustamante 2013: 61-62 suggests an alternative version of m_{op} where the meaning of $i[\text{past}]$ is incorporated into the operator and m_{op} combines directly with the accessibility relation R :

$$(i) \quad m_{op} = \lambda R \lambda Q \lambda t_1 \lambda w_1 [\lambda t_1 [R(t_2)t_2 \wedge t_2 < t_1](w_1)(t_1) \subseteq \lambda w \neg Q(w)(t_1) \wedge Q(w_1)(t_1)]$$

PAST

²⁷Which for (22) has the form $\lambda t \lambda w$ [Juan smokes in w at t].

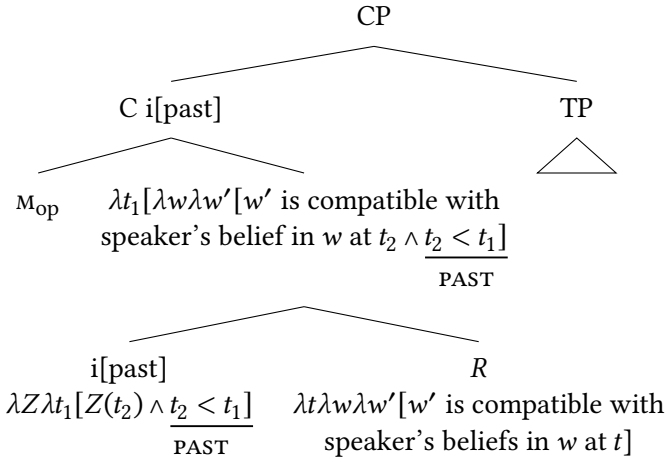


Figure 2: The mirative operator and the interpretation of the displaced tense morpheme (Bustamante 2013: 55)

58). At the same time, the past modal base P entails $\neg Q$.²⁸ This renders the clash between the assertion Q and what follows from the speaker's past beliefs that "triggers the sense of surprise associated with miratives" (Bustamante 2013: 54).

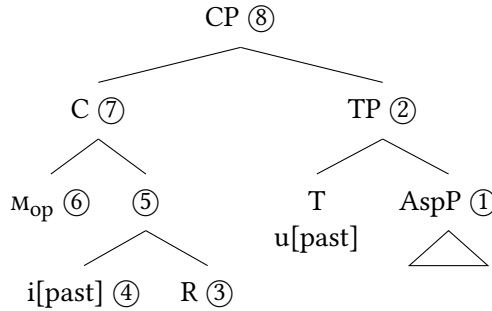


Figure 3: The TP and the derivational steps (Bustamante 2013: 56)

Concerning the precedence relation between the past beliefs and the speech/discovery time, Bustamante (2013: 58) notes that it is better accounted for in

²⁸Note that in the course of the composition, the time variable of the modal base P is bound to the value of the past time t_2 in the semantic representation of $i[past]$, such that the speaker's beliefs at the past moment t_2 entail the belief $\neg Q$ holding at some t_1 which is not the actual speech time, such that no inconsistency of beliefs at the actual speech time arises. See Bustamante (2013: 56–57) for the details of the derivation.

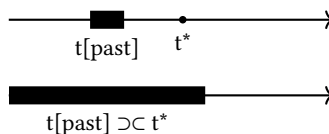
terms of immediate precedence by means of the abut-relationship \supset indicating a common boundary between these times.²⁹

Crucially, Bustamante (2013: 112–114) uses this immediate precedence relation also to explain why only past tenses such as the past imperfect (and the present perfect) but not the past perfective in Spanish can have mirative extensions: “We need a [past] tense feature that makes reference to an interval whose right boundary is the discovery time.” She argues that only the [past] tense associated with imperfective (and some perfect) forms is able to do so, due to the properties of events it is associated with, such as durative, continuous, and indefinite, in contrast to the perfective which is associated with properties like terminative, punctual, and definite (see also Cipria & Roberts 2000: 300). With the perfective, the event is seen as a subset of the reference time and thus completed or punctual, hence the perfective does not provide the right interval for the modal base to hold.³⁰

Bustamante (2013: 115) implements this “aspectual requirement on the past tense” in the Spanish mirative in terms of the set of syntactic features such that C asks for a i [past, unbounded] feature, where the [unbounded] feature is the contribution of the imperfective aspect, following Pancheva (2003) who defines [unbounded] as setting up the event time as a superset of the reference time ($RT \subseteq ET$). In contrast, [bounded], the feature of the perfective, is defined as setting up the event time as a subset of the reference time ($ET \subseteq RT$). Given this constraint on the aspectual morphology of the participle, Bustamante (2013: 51) assumes that aspect contributes its usual interpretation to the assertion.³¹

²⁹The abut-operator is adopted from Kamp & Reyle (1993: 573) where it is used to represent the temporal relation between the result state and the event in the perfect and where “the state starts at the very moment the event ends.”

³⁰As an additional argument Bustamante (2013: 112–113) points out the observation made in Iatridou (2000) that the ‘fake’ past in counterfactuals is accompanied by imperfective aspect and that putting perfective aspect in counterfactuals makes the past become real. From this Bustamante concludes that “there is an incompatibility between ‘fake’ past tense or, in our terms, displaced real tense and perfective aspect.” The aspectual properties of the two tenses and the requirement of the modal base on the right interval for the past beliefs are shown below (where t^* is the utterance time); see Bustamante (2013: 114):



³¹ Bustamante (2013: 51–52) claims that the aspectual contribution of the imperfect is the im-

Finally, [Bustamante 2013: 14](#) points out that the Spanish mirative is not a direct expression of surprise in that the mirative operator does not encode surprise by itself. Instead, surprise is pragmatically derived from the clash between the recently discovered facts and what the past beliefs imply. This distinguishes the Spanish mirative from exclamations and exclamatives which can express a wider range of speaker emotions. Being compatible with the expression of surprise, though, the mirative can be embedded under an exclamatory illocutionary operator (EXC; defined in [Gutiérrez-Rexach 1996](#)), assuming the structure in [Figure 4](#).

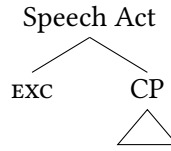


Figure 4: Embedding CP under an exclamatory operator ([Bustamante 2013: 162](#))

As compared to the Spanish mirative, the Bulgarian admirative has not only modal, temporal, and aspectual, but also evidential properties that need to be accounted for. I therefore suggest that in addition to a modal base of past beliefs, the Bulgarian admirative explicitly introduces an evidential component in terms of (i) the evidence acquisition time (EAT) that precedes (in inferential and reportative contexts) or coincides with (in direct evidence contexts) the speech time ($EAT \leq ST$) and (ii) the requirement that the speaker's belief base at discovery time entails the asserted proposition, i.e. the speaker has some evidence for the assertion prior to or at the time the assertion is made.³² Although Spanish miratives do not have evidential morphology, the evidential meaning component of the Bulgarian admirative fits naturally with the mirative semantics defined for the Spanish construction: the belief clash the admirative expresses is caused by some evidence and the existence of such evidence is suggested by the admirative itself, not merely by context.³³ It also fits with [Bustamante's](#) (2013: 57) obser-

perfective aspect. Following [Kratzer \(1998\)](#), she assumes the latter to locate the reference time within the event time ($RT \subseteq ET$); see (i):

- (i) $\llbracket \text{imperfective} \rrbracket = \lambda P. \lambda t. \lambda w. \exists e [t \subseteq \tau(e) \wedge P(e)(w) = 1]$.

³²Idea (i) is adopted from [Smirnova's](#) (2011b) definition of the evidential modal operator EV .

³³Note that similar to the Spanish operator M_{op} , the Bulgarian admirative operator is covert, since its morphology is not unambiguous enough to trigger a mirative interpretation independently of context.

vation that while the discovery time usually coincides with ST, there are cases where the discovery time precedes ST, like reporting news by means of miratives as well as miratives embedded under predicates like *to turn out*. This accounts also for the Bulgarian data discussed in §3. Although the admirative operator employs the usual temporal precedence relation, the relation between EAT and ST is best captured in terms of an immediate precedence (the abut-relation $\supset\subset$), which accounts for Rett & Murray's (2013) recency requirement mentioned in §3.2.

Similar to the Spanish mirative, the mirative interpretation of the Bulgarian admirative involves reference to a present eventuality, speaker commitment to the truth of p , and can be seen as the result of a displaced interpretation of the temporal feature of the past imperfect participle within the domain of the admirative operator ADMIR. The operator introduces a modal base of past beliefs that implies a proposition contradicting the asserted proposition, and binds the temporal variable of the assertion in TP to ST. The clash of old and new beliefs is caused by evidence for the asserted proposition. The operator is defined in (25), where P is the modal base specified by the accessibility relation R defined in (24) above, t' is the EAT introduced by the admirative, and Q represents the assertion.

$$(25) \quad \text{ADMIR} = \lambda P \lambda Q \lambda t_1 \lambda w_1 \exists t' [(t' \leq t_1) \wedge [P(w_1)(t_1) \subseteq \lambda w \neg Q(w)(t_1)] \wedge Q(w_1)(t_1)] \\ \wedge [\lambda w' [w' \text{ is compatible with speaker's beliefs in } w_1 \text{ at } t'] \subseteq Q(w_1)(t')]$$

When applied to the assertion, the operator ADMIR yields the following interpretation of the admirative construction: admirative sentences are assertions based on evidence of some sort (reportative, inferential, direct) contrasted against the speaker beliefs that hold up to the speech time which may coincide with the discovery time or succeed it. The speaker's past beliefs entail a conclusion that clashes with the assertion, which triggers belief revision, while the actual current beliefs at t' entail the assertion. I further assume that, similar to the Spanish mirative, the Bulgarian admirative does not encode surprise itself, but the sense of surprise associated with it is rather a result of the clash between what the past beliefs imply and the recently acquired new belief. Its compatibility with the expression of surprise makes the exclamatory environment especially suitable for the admirative, which is accounted for by assuming a structure like the one presented in Figure 4 for the Spanish mirative.

In terms of the aspectual makeup of the participle and the reason why it is restricted to unbounded eventualities, similar assumptions can be made for the Bulgarian admirative as for the Spanish mirative. However, additional assumptions are needed for the distinction between MORPHOLOGICAL ASPECT related to

the opposition imperfect : aorist and SITUATION or VIEWPOINT ASPECT related to the distinction between imperfective and perfective lexical forms in Bulgarian. With [Rivero & Slavkov \(2014\)](#) I distinguish between morphologically imperfect past participles like, e.g., *pišel* and morphologically perfective (aorist) past participles like *pisal*. In addition, I adopt their assumption that “the morphological contrast between imperfect tense and aorist tense inflections (imperfect *-še* vs. aorist *-a*) systematically encodes imperfective vs. perfective Viewpoints in the semantics” ([Rivero & Slavkov 2014](#): 235). This applies to both indicative imperfects and aorists and their participles, where I assume the same semantics for the imperfective and perfective as in [Bustamante](#) (see fn. 31). Consequently, Bulgarian imperfect imperfective participles have the two features [past] and [unbounded], which is the required combination to feed the temporal argument of the modal base, as shown above. The ban on aorist and perfective forms in admirative sentences is explained by the introduction of the feature [bounded] by the aorist and perfective participles which always entails a past eventuality and disallows the displacement of the [past] feature.

A further reason why the Bulgarian admirative construction is restricted to morphologically imperfect and lexically imperfective participles seems to be related to the fact that a participle combining perfective aspect with imperfect tense like *napišel* in (26) is restricted to specific, repetitive contexts.

- (26) *Vseki път kogato napišel edno izrečenie, Petăr*
 every time when write.IPF.PFV.PTCP one sentence Petăr
otival da puši.
 go.IPF.IPFV.PTCP PTCL smoke.3SG.PRS
 ‘Each time Petăr wrote a sentence he went to smoke, it is said.’

The use of perfective aorist participles seems in general less restricted; however, this combination can only be used in conclusives and renarratives (like the present perfect), as the aorist is banned in admiratives; see (27) and (28).

- (27) *Context*: I see a picture of my good old friend Maria on a book in a window of a book shop and conclude that Maria has published a book. I say to myself:

*Maria *(e) napisala kniga!*
 Maria is write.AOR.PFV.PTCP book
 ‘Maria has written a book!’

- (28) *Context:* Ivan tells me that Maria has written a book. I find this exciting and later tell Petăr:

Ti ču li? Maria napisala kniga!
 you hear.AOR.2SG Q Maria write.AOR.PFV.PTCP book
 ‘Did you hear? Maria has written a book, they say!’

As a matter of fact, admiratives allow for the combination of secondary imperfective verbs and imperfect participle, as shown in (29).

- (29) *Context:* Ivan tells me that Maria has written a bestseller. Later, I meet Maria who denies that she has ever written a book. I suddenly realize that Ivan may have acquired a bad habit of making things up and exclaim:

Znači toj si izmisljal!
 mean.3SG.PRS he REFL make.up.IPF.PFV.PTCP
 ‘So he is making up things!’

Here, the temporal interpretation is that of a present (habitual) eventuality, which however carries over to the past event of Ivan telling the speaker a lie. This shows that the interplay of morphological and viewpoint aspect in the case of the Bulgarian admirative may be more complex than what has been assumed above. However, spelling out this contribution in detail is an issue that must be left to future work.

5 Summary and discussion

In this paper, I provided an analysis of the Bulgarian admirative in terms of a modal operator that captures the evidential, temporal, and aspectual properties of the construction. In this section, I discuss some consequences and residual issues related to the analysis presented above.

First of all, assuming that the admirative indicates a clash of beliefs accounts for the sense of epistemic uncertainty observed in, e.g., Smirnova (2013: 510) who argues that “the evidential in direct contexts expresses commitment that is weaker than knowledge”.³⁴

Second, in order to fully account for the place of the admirative in the evidential system, operators for the renarrative and the conclusive need to be defined that adequately capture their properties discussed in the previous sections:

³⁴See a similar claim in Friedman (1981: 25) saying that Bulgarian evidential forms in direct contexts express “some state of ignorance or disbelief”.

- Concerning the renarrative, such relevant properties are:
 - It can be formed by both imperfect and aorist participles of both imperfective and perfective verbs, where imperfect participles in renarrative forms get either past or present interpretation depending on context.
 - It does not commit the speaker (but possibly the reporter) to the proposition.
 - It indicates that the evidence is acquired before the speech time ($EAT < ST$).
 - It can be embedded under an illocutionary exclamative operator with interpretations ranging from surprise or disbelief to a number of further emotive attitudes.
- As for the forms of the conclusive:
 - They exhibit both types of past participles and aspectual forms.
 - They relate the assertion to the speaker's beliefs (thus involving a modal base).
 - They indicate that the evidence is acquired before the speech time ($EAT < ST$).
 - They are embeddable under an illocutionary exclamative operator.

In addition, appropriateness conditions need to be specified that govern the application of one or the other evidential operator.

Third, allowing the temporal relation between discovery time and speech time to be one of either precedence or coincidence accounts for the fact that admiratives can be based not only on direct but also inferential and reportative evidence where the discovery time temporally precedes the speech time ($EAT < ST$). This is the case in (29) above. A further example illustrating this is Koev's (2017) deferred relalization example cited in (30), where the speaker "has direct evidence for the described event but the realization that she does comes at a later time" (Koev 2017: 4):³⁵

³⁵Koev's glosses are kept.

- (30) *Context:* One of Nixon's aides vividly recalls walking into the Oval Office and seeing the President erase some tapes. She later learns about the Watergate scandal from the media and makes sense of what she had seen. When asked what happened on that day, she says:

Kogato vljazo-x, Niksān trie-še njakakv-i zapis-i. Toj zaličava-l
 when enter-PAST Nixon erase-PAST some-PL tape-PL he remove-EV
ulik-i-te.
 clue-PL-DEF

'When I walked in, I saw Nixon erase some tapes. He was covering up the clues, as I learned later.'
 (Koev 2017: 4)

Koev (2017: 4) argues that this is not an example of mirativity, but a "truly evidential interpretation", since miratives are, according to him, conventionally accompanied by exclamative intonation and the speaker need not be surprised that Nixon was covering up the clues, as she may have heard about the Watergate scandal before uttering the sentence. There are, however, some arguments in favor of treating such cases of late realization in terms of mirativity. As already pointed out, mirativity is not necessarily accompanied by exclamative intonation and involves (sudden) discovery or realization typically related to a clash of beliefs. Besides, the direct evidence the speaker in (30) has is that of Nixon erasing some tapes, rather than of Nixon covering up clues. It is therefore more plausible to assume that at the time of obtaining this direct evidence, the speaker did not have information about the Watergate scandal, since otherwise she would have realized (inferred) that the event of tape-erasing she had witnessed was in fact/at the same time an event of covering up clues, or that the tape-erasing was done with the aim of covering up clues. The use of the zero-auxiliary form can thus be interpreted in terms of deferred realization and clash of old and new beliefs, which is the content of the admirative: the speaker's past beliefs entail the belief 'Nixon was erasing some tapes' acquired through direct observation; upon acquiring information about the scandal, the speaker realizes that Nixon was not just erasing some tapes, but by doing this was actually covering up clues, which runs against what the speaker believed earlier.

The analysis of late realization cases like (30) in terms of mirativity is also supported by typological evidence, see, e.g., Aikhenvald 2012: 441 who discusses mirative statements that are based on visual evidence or inference and "post-factum interpretation of the action judged by the results". The main argument that Koev uses to rule out a mirative interpretation is related to the fact that the discovery time in the example temporally precedes the speech time, which is

incompatible with direct evidential sources. This temporal relation is, however, compatible with the meaning of the admirative defined in (25), as well as with the clash of old and new beliefs based on some evidence that it encodes. Besides, it could be argued that the evidence leading to the mirative interpretation is not the directly observed event of tape-erasing, but the realization of the fact that the tape-erasing was in fact an act of covering up clues.

On the other hand, the eventuality referred to by the utterance is located in the past, not in the present, as was assumed for admirative sentences, which poses a problem for the analysis of (30) in terms of mirativity. One possible solution would be to assume that the past interpretation follows from the precedence relation between the discovery time and the speech time ($EAT < ST$) and the fact that the contextually salient time that is relevant for the interpretation of the assertion is the time of the originally observed evidence, rather than ST ($RT = EAT$), which results in $RT < ST$ (= past). Interestingly, the form of the participle in (30) is the same as in (29): a combination of imperfect participle and secondary imperfective verbal aspect. Figuring out how exactly cases of deferred realization with this morphology fit the analysis presented here must be left to future work.

Finally, a residual question that needs to be addressed in future work concerns the origin of the admirative. Nicolova (2013) argues that the admirative originated from the perfect in its function to ascertain the existence of results from non-observed actions. This fits the crosslinguistic observation in Bybee & Dahl (1989: 73–74) of indirect evidential uses licensed by the perfect due to its property of expressing past actions with present results: The indirect evidential uses can be viewed as extensions of “known by its results” to “action known by inference/reports” (see also Lau & Rooryck (2017) who talk about knowledge of an event by indirect means). However, this path would immediately explain the emergence of the inferential and hearsay uses of the admirative out of the present perfect, but not the direct evidence uses. To shed more light on this issue, diachronic and typological data need to be thoroughly examined.

Abbreviations

ADMIR	admirative operator	M _{op}	mirative operator
AOR	aorist	NEG	negation
ACC	accusative	PFV	perfective aspect
DEF	definite	PL	plural
EXC	exclamative operator	PRS	present tense
EV	evidential (operator)	PTCL	particle
IMP	imperative	PTCP	participle
INF	infinitive	Q	question particle
IPF	imperfect	REFL	reflexive pronoun
IPFV	imperfective aspect	SG	singular

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Chapter 7

From measure predicates to count nouns: Complex measure nouns in Russian

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This paper offers a semantic analysis of morphologically complex measure nouns in Russian (e.g., *trexlitrovka* ‘three-liter-КА^{SUFFIX}’). *Prima facie* such nouns look very much like measure predicates such as *three liters* that appear in pseudo-partitives as *three liters of water*. I show that they are not such. In particular I shall argue that: (i) complex measure nouns are not measure predicates, but are genuine count nouns denoting entities with certain measure characteristics; (ii) they are derived via an operation which shifts measure predicates expressing measure properties to nouns denoting disjoint entities that have these properties; (iii) the interpretational domain involves a wide range of entities including containers and portions. I will then show that the analysis has at least two important implications: (a) it supports the reality of measure predicates (*three liters*); (b) it shows that measure-to-count shifts are productive semantic operations.

Keywords: measure/count predicates, nominalization, measure-to-count semantic shifts

1 Introduction

Colloquial Russian uses productively morphologically complex measure nouns. These are nouns constructed out of a numeral, a measure word, and a nominal suffix *-ka* (1).

- (1) a. *trex- litr-ov- ka samogon-a*
 three.GEN- liter-GEN.PL- KA.NOM.SG moonshine-GEN.SG
 ‘a three-liter jar/bottle of moonshine’



- b. *sto- gramm-ov- ka vodk-i*
 hundred.NOM- gram-GEN.PL- KA.NOM.SG vodka-GEN.SG
 ‘a 100-gram glass of vodka’

Such nouns apparently look like measure expressions such as *tri litra/trex litrov* ‘three liters’ used in pseudo-partitives such *tri litra/trex litrov vody* illustrated in (2).

- (2) a. *V étoj kanistre tri litr-a vod-y.*
 in this jerrycan three.NOM liter-GEN.SG water-GEN.SG
 ‘There are three liters of water in this jerrycan.’
 b. *Trex litr-ov vod-y nam dolžno xvatit’.*
 three.GEN liter-GEN.PL water-GEN.SG us must suffice
 ‘Three liters of water should be enough for us.’

However, the two constructions are very different. While *three liters* in (2) expresses measure properties of entities, the MEASURE NOUNS in (1) denote actual objects (glasses, jars etc..) that have these properties. As further shown in (3), these nouns have sortal uses and can be modified by adjectives. They cannot be used as adjectival modifiers of other nouns (2).

- (3) a. *Taščit’ napolnennye pjati-litrov-ki okazalos’ ne v primer tjaželej pustyx.*
 carry filled five-liter-KA.ACC.PL appeared NEG in example
 harder empty
 ‘It was incomparably harder to carry full five-liter (plastic) jars than empty ones.’ [Google Books]
 b. *granen-ye / xrustal’n-ye sto-grammov-ki*
 faceted-NOM.PL crystal-NOM.PL hundred-gram-KA.NOM.PL
 ‘faceted/crystal 100-gram glasses’

- (4) * *trex-litrov-ka bank-a*
 three-liter-KA.NOM.SG jar-NOM
 Intended: ‘a three-liter jar’

While the examples in (3)-(2) show that measure nouns are genuine nouns at type $\langle e, t \rangle$, the data in (4) show that they are COUNT NOUNS denoting sets of disjoint individuals as they can be pluralized, modified by numerals, and be antecedents of distributive operators such as reciprocals.

- (5) *Pjat' trex-litrov-ok* / *Trex-litrov-ki* *stojali odna na drugoj.*
 five three-liter-KA.GEN.PL three-liter-KA.NOM.PL stood one on other
 'Five three-liter jars / Three-liter jars stood on top of each other.'

Importantly, the CONTAINER NOUNS illustrated so far are only a subclass of a wider range of complex nouns built of expressions denoting measures in different dimensions and denoting salient objects which have the stated properties (e.g. power: *sto-vat-ka* 'a 100-watt bulb'; time: *pjati-let-ka* 'a five-year project/a five-year-old'; distance: *sto-metrov-ka* 'a hundred-meter route/stretch'). Furthermore, these nouns are used very productively. *Stogrammovka* in (1b) for example, may refer to a variety of objects which weigh 100 grams with the nature of the object being determined by context (e.g. 'a 100ml bottle/tube', 'a 100g package/bar', 'an ultra-light coat', 'a 100g ball/roll' etc.) (5).

- (6) a. ... *Kupila sto-grammov-ku* *lokobejza.*
 bought 100-gram-KA.ACC.SG Locobase
 'I bought a 100-gram tube of Locobase.' [irecomend.ru]
- b. *Segodnja odela sto-grammov-ku* *poverx svišota.*
 today put.on 100-gram-KA.ACC.SG over sweatshirt
 'Today I put a light coat on top of my sweatshirt.' [ladies.zp.ua]
- c. *56 grammovye šokoladne plitk-i po forme i ob"emu*
 56 gram chocolate bar-PL by form and volume
napominajuščie starye sto-grammov-ki
 reminding old 100-gram-KA.ACC.PL
 '56-gram bars which look very much like our old 100-gram bars'
 [kharkovforum.com]

These data raise a number of questions: (i) *What is the semantic interpretation of these nouns?* (ii) *How are they derived semantically and morphologically?* (iii) *What can we learn about the semantics of measure expressions from these nouns?*

In the rest of the paper I shall explore these nouns in the light of recent work on the semantics of counting and measuring and argue that: (i) complex measure nouns are not measure predicates but are genuine count predicates denoting sets of discrete entities with certain measure properties; (ii) they are derived via a nominalization operation which shifts measure modifiers, expressed by numeral noun phrases or adjectives, to count predicates denoting sets of disjoint entities; (iii) the analysis correctly predicts that the interpretational range of complex nouns involves CONTAINERS and COUNTABLE PORTIONS in the sense of Khrizman

et al. 2015. This work has wider theoretical implications. First, it supports the reality of mass measure predicates as argued in Landman 2016. Second, it shows that measure-to-count shifts are linguistically real, productive semantic operations.

The paper will be structured as follows. In the next section I shall discuss the morphological properties of complex measure nouns and argue that they can be derived either from noun phrases headed by a numeral or adjectives. In §3 I provide a basic semantic interpretation of measure nouns. §4 and §5 extend this analysis to container and portion uses respectively. We shall finally discuss the theoretical implications of the proposed analysis in §6.

2 Morphological derivation

-ka is a productive suffix used to derive nouns from lexical items of different syntactic categories which, according to at least some grammarians, include adjectives with the *-ov-* suffix (e.g., *metrovyj* ‘measuring one meter/calibrated in meters’) and complex phrases comprised of a noun modified by a numeral (*pjat’ let* ‘five years’) (a.o. Vinogradov 1960). Such a classification suggests two possible ways for deriving measure nouns: from measure noun phrases such as *tri litra* ‘three liters’ used in pseudo-partitives such as *three liters of water* in genitive case in Figure 6, or from complex measure adjectives such as *trexlitrovyy* ‘three-liter’ as in *a three-liter jar* in Figure 7. Notice that the genitive plural suffix is homophonous to the adjectival *-ov-*.

NOMINATIVE NP		GENITIVE NP		COMPLEX NOUN
[tri litr-a]	→	[trex litr-ov]	→	[trex-litr-ov-ka]
three.NOM liter-GEN.SG		three.GEN liter-GEN.PL		three.GEN-liter-GEN.PL-KA
‘three liters (NP)’		‘(of) three liters’		‘a three-liter jar’

Figure 1: Numeral NP-to-measure noun-pattern

NOMINATIVE NP		ADJECTIVE		COMPLEX NOUN
[tri litr-a]	→	[trex-litr-ov-yj]	→	[trex-litr-ov-ka]
three.NOM liter-GEN.SG		three.GEN-liter-ADJ-M.SG		three.GEN-liter-GEN.PL-KA
‘three liters’ (NP)		‘three-liter’		‘a three liter jar’

Figure 2: Numeral adjective-to-measure noun-pattern

I shall now bring evidence that both patterns occur. In particular, we shall see that there are cases which can be analyzed only as being derived from numeral NPs as in Figure 6 and, conversely, there are measure nouns for which only the ‘adjective-to-noun’ pattern in Figure 7 is possible.

We start with the pattern in Figure 7. This pattern is very clearly exemplified by *(odno)litrovka* ‘a one-liter jar/bottle’. The complement of the genitive NP *odnogo litra* ‘of one liter’ is singular and does not have the suffix *-ov*. Therefore deriving ‘one-liter jar’ in the pattern in Figure 6, i.e. from a measure phrase, would produce *(odno)litarka*, which does not exist (Figure 8). The *-ov*-suffix in *(odno)litrovka* must come from the adjective *litrovyy* ‘one-liter’. Thus the most plausible derivation for *litrovka* is from the adjectival base, i.e. through the pattern in Figure 7, as shown in Figure 9.¹

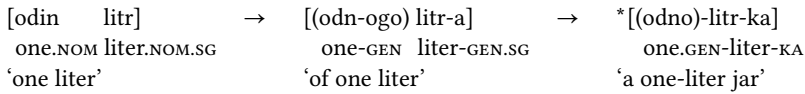


Figure 3: Numeral NP-to-measure noun-pattern (ungrammatical)

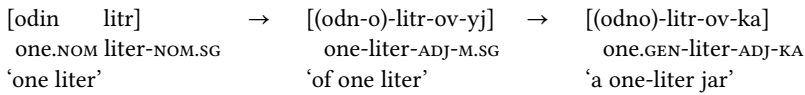


Figure 4: Numeral adjective-to-measure noun-pattern (ungrammatical)

Evidence for the pattern in Figure 6 comes from the contrast between *stogrammka* in (14a), (7c), and *stogrammovka* in (14b), earlier illustrated in (1b) and (5). While the noun phrase ‘hundred grams’ has two productive variants, one with the *-ov*-suffix in (8a) and one without it (8b), the adjective ‘hundred-gram’ has only one productive form which is derived using the adjectival suffix *-ov*- (12). Therefore, *stogrammovka* could be derived either from the adjectival form *stogrammovyj* in (9a) or from the measure phrase *sto grammov* (8a). *Stogrammka*, which lacks *-ov*-, however, is most plausibly derived from the measure phrase *sto gramm* in (8b), since the adjectival form *stogrammnyj* in (9b) is not productive. I did find few occurrences of this form on the Internet, but all my informants who are ready to accept *stogrammka* (even though this form is quite rare, too) reject it. At least for those speakers, *stogrammka* must be derived from a nominal phrase *sto gramm* and not from the adjective *stogrammovyj*, i.e. via the pattern in Figure 6.

¹Examples such as *pjatiletka* ‘a five-year old/a five-year program’ have also been treated as derived from adjectives. Such an analysis assumes that deletion of the adjectival suffix *-n*- takes place, *pjatiletnij* (ADJ) – *pjatiletka* (NOUN) (Townsend 1975 as opposed to Vinogradov 1960).

- (7) a. *sto-gramm-ka*
100-gram.GEN.PL-KA
'a 100-gram cup/bottle'
- b. *sto-gramm-ov-ka*
100-gram.GEN.PL-KA
'a 100-gram cup/bottle'
- c. ... *u menja segodnja est' na dve sto-gramm-ki, èto takie*
at me today there.is on two sto-gramm-ka.GEN.PL this such
plastikovye stakančiki s zapakovannoj vodkoj.
plastic cups with packed vodka
'Today I have enough money to buy two *100-gramm-ka*, those small
plastic cups filled with vodka.' [an-kom.livejournal.com]

(8) Measure phrase

- | | |
|----------------------------------------------------------|-------------------------------------------------------|
| a. <i>sto gramm-ov</i>
100 gram.GEN.PL
'100 grams' | b. <i>sto gramm</i>
100 gram.GEN.PL
'100 grams' |
|----------------------------------------------------------|-------------------------------------------------------|

(9) Adjective

- | | |
|--------------------------------------------------------------|---------------------------------------------------------------|
| a. <i>sto-gramm-ov-yj</i>
100-gram-ADJ-M.SG
'100-gram' | b. ? <i>sto-gramm-n-yj</i>
100-gram-ADJ-M.SG
'100-gram' |
|--------------------------------------------------------------|---------------------------------------------------------------|

We therefore conclude that complex measure nouns are derived via two possible routes: either from measure phrases like *three liters* or *100 grams*, or from measure adjectives such as *three-liter* or *100-gram*. Some nouns are derived only with one pattern (e.g., *litrovka*, *stogrammka*) and for some nouns both patterns are equally plausible (e.g., *stogrammovka*.) In the following section I provide a semantic analysis which not only is compatible with the morphological facts discussed above but also explains them.

3 Semantic interpretation

In the previous two sections we have shown that: (i) measure nouns are genuine count nouns and (ii) they are derived either from measure noun phrases (e.g., *sto gramm(ov)* '100 grams') or from measure adjectives (*stogrammovyj* '100-gram'). I

shall now provide a semantic derivation. We begin by outlining a number of theoretical assumptions on the semantics of count nouns and measure expressions.

With Rothstein (2011), Landman (2011; 2016), and Filip & Sutton (2016) I assume that the count/mass contrast in the nominal domain amounts to the distinction between disjoint and overlapping denotations. In particular, singular count nouns denote sets of disjoint entities, and plural count nouns denote sets of these disjoint entities closed under sum, whereas mass denotations can be generated by sets of overlapping entities. Measure nouns such as *trexlitrovka*, which have count denotations, will therefore denote sets of disjoint entities.

As for the measure expression, I will base myself on the framework in Landman (2004; 2016), Rothstein (2009; 2011; 2017) (for English), and Partee & Borschev (2012), Khrizman (2016a,b) (for Russian). In this framework measure phrases such as *100 grams* are intersective modifiers which express measure properties, i.e. properties of having a value on a dimensional scale calibrated in certain units (13).

- (10) a. $P_{\text{MEAS}} = \lambda x. \text{MEAS}_{\text{DIM UNIT}}(x) = n$
 b. $P_{100 \text{ GRAMS}} = \lambda x. \text{MEAS}_{\text{WEIGHT GRAM}}(x) = 100$
 the property of having the value 100 on a weight scale calibrated in gram units

Rothstein (2017) showed that measure properties as defined in (13) are expressed by constructions of two types. One, as already mentioned above, is via nominal measure heads such as *100 grams* used in pseudo-partitives like *100 grams of flour* (21a). The other is via distributive measure adjectives such as *100-gram* in *a 100-gram apple* (22a). Both expressions denote the property of weighing 100 grams. In (21) this property is assigned to sums of entities denoted by the mass predicate *flour* (21b) and in (22) the same property is assigned to individual apples in the denotation of the count singular *apple* (22b).²

- (11) 100 grams of flour
 a. $\llbracket \text{hundred grams} \rrbracket = \lambda x. \text{MEAS}_{\text{WEIGHT GRAM}}(x) = 100$
 b. $\llbracket \text{hundred grams of flour} \rrbracket = \lambda x. \text{FLOUR}(x) \wedge \text{MEAS}_{\text{WEIGHT GRAM}}(x) = 100$
 the set of sums of flour that weigh 100 grams

²It is known that the classifier and the adjectival use of measure expressions illustrated in (21) and (22), respectively, show differences in distribution and interpretation. Classifier uses like those in (21) induce extensive readings, whereas adjectival forms like those in (22) encode non-extensive measure functions. Further, classifier uses are not distributive, whereas adjectival ones are (Schwarzschild 2005). Rothstein (2017) shows that such differences are not an indication of a different semantics of the two expressions but follow from the differences in their syntactic positions.

(12) a 100-gram apple

- a. $\llbracket \text{hundred-gram} \rrbracket = \lambda x. \text{MEAS}_{\text{WEIGHT GRAM}}(x) = 100$
- b. $\llbracket \text{a hundred-gram apple} \rrbracket = \lambda x. \text{APPLE}(x) \wedge \text{MEAS}_{\text{WEIGHT GRAM}}(x) = 100$
the set of apples such that each weighs 100 grams

With this background I now propose a basic semantic derivation of morphologically complex measure nouns as follows in (16). Measure nouns are derived via a nominalization operation, expressed by the *-ka* suffix, which shifts intersective predicate modifiers expressing measure properties to count nouns denoting sets of contextually determined disjoint elements which have these measure properties. *Stogrammovka*, for example, starts off as a measure predicate denoting the property of weighing 100 grams in (24a). *-KA* shifts it into a singular count predicate denoting the set of disjoint entities such that each weighs 100 grams (24b).

(13) The semantics of complex measure nouns

- a. $\llbracket \text{-ka} \rrbracket = \lambda P_{\text{MEAS}} \lambda x. N_c(x) \wedge P_{\text{MEAS}}(x)$,
 N_c is a property whose context is contextually determined, N_c is a disjoint set.
- b. $\llbracket \text{measure noun} \rrbracket = \lambda x. N_c(x) \wedge P_{\text{MEAS}}(x)$,
 N_c is a property whose context is contextually determined, N_c is a disjoint set.

(14) a. $P_{100 \text{ GRAMS}} = \lambda x. \text{MEAS}_{\text{WEIGHT GRAM}}(x) = 100$

- b. $\llbracket \text{stogrammovka} \rrbracket$
 $= \lambda P_{\text{MEAS}} \lambda x. N_c(x) \wedge P_{\text{MEAS}}(x) (\lambda x. \text{MEAS}_{\text{WEIGHT GRAM}}(x) = 100)$
 $= \lambda x. N_c(x) \wedge \text{MEAS}_{\text{WEIGHT GRAM}}(x) = 100$,
 N_c is a disjoint set.

the set of contextually determined disjoint entities (like jackets, bars, etc.) that weigh 100 grams

Given that measure properties are expressed by both numeral noun phrases and measure adjectives, *-KA* can take both genitive NPs such as *sto gramm(ov)* and adjectives such as *stogrammovyj* as input. We thus see now that the proposed analysis predicts and explains the dual pattern of morphological derivation discussed in the previous section.

Further support for the analysis in (16) comes from examples like those in (18). Here, an intersective adjective denoting a property of being grown up/mature is shifted to a count noun denoting individuals who are grown up. This shows that

shifts from properties to count nouns denoting objects with the stated properties are attested in a wider range of expressions in Russian. The difference is that, with measure modifiers, this shift is overtly expressed through -КА.

- (15) a. *On vzrosł-yj čelovek.*
 he grown.up-NOM.M.SG man.NOM.SG
 ‘He is a grown up person.’
 b. *Nekotor-ye vzrosł-ye vedut sebja kak deti.*
 some-NOM.PL grown.up-NOM.PL behave themselves like children
 ‘Some grown-up people behave as children.’

We have now worked out the basic semantic interpretation of complex measure nouns and have shown how to derive sets of individuals having a particular measure property. In the following section we shall take a closer look at a productive variant of such expressions, container nouns.

4 Container uses

4.1 Semantic interpretation

The contrast in (16a) and (16b) shows that container interpretations of complex nouns are different from other readings. In particular in (16a) *stogrammovka* refers to a bar whose weight is 100 grams, whereas in (16b) the same noun refers to a glass which can hold 100 grams but does not weigh 100 grams by itself.

- (16) a. *56 grammovye šokoladne plitk-i po forme i ob’emu*
 56 gram chocolate bar-PL by form and volume
 napominajuščie starye sto-grammov-ki
 reminding old 100-gram-KA.ACC.PL
 ‘...56-gram bars which look very much like our old 100-gram bars’
 b. *na polke stojali xrustal’nye sto-grammov-ki.*
 on shelf stood crystal 100-gram-KA.NOM.PL
 ‘There were a few 100-gram glasses on the shelf.’

To capture that contrast I follow Casati & Varzi (1999) and Rothstein (2009; 2017) and treat containers as complex objects which incorporate holes which are themselves objects to which properties can be assigned (20).

- (17) Container-definition (Rothstein 2017: 218)
 a. A container is an object associated with a hole

- b. If $\text{CONTAINER}(x)$ then

$$\forall U : \text{MEASURE}_{\text{VOLUME}, U}(x) = \text{MEASURE}_{\text{VOLUME}, U}(\text{HOLE}(x)).$$

The basic interpretational schema in (16) is then extended to container complex nouns as follows in (21). Container measure nouns denote sets of contextually disjoint objects that are containers whose holes have a certain measure property in terms of volume (22).³

- (18) The semantic interpretation of measure nouns denoting containers
 $\lambda x.N_{\text{CONTAINER}_c}(x) \wedge \text{MEAS}_{\text{VOL UNIT}}(\text{HOLE}(x)) = n$, $N_{\text{CONTAINER}_c}$ is disjoint.
 the set of contextually determined entities whose holes measure to n number of volume units
- (19) a. $\llbracket \text{stogrammovka} \rrbracket$
 $= \lambda x.N_{\text{CONTAINER}_c}(x) \wedge \text{MEAS}_{\text{VOL GRAM}}(\text{HOLE}(x)) = 100$,
 $N_{\text{CONTAINER}_c}$ is disjoint.
 the set of contextually determined disjoint containers whose volume is 100 grams
- b. $\llbracket \text{trexlitrovka} \rrbracket = \lambda x.N_{\text{CONTAINER}_c}(x) \wedge \text{MEAS}_{\text{VOL LITER}}(\text{HOLE}(x)) = 3$,
 $N_{\text{CONTAINER}_c}$ is disjoint.
 the set of contextually determined disjoint containers whose volume is 3 liters

Shifts from a measure interpretation to a container interpretation are not unknown. Khrizman et al. (2015) show that lexical measures like *liter* in certain contexts shift to a container reading (23).

- (20) He arrived home and knocked on the door with one liter of milk. His mother said to him: “I asked you for two liters. Where is the second one?” Her son said to her: “It broke, mother.”
 [Matilda Koén-Sarano (ed.), *Folktales of Joha, Jewish Trickster*, p. 22, The Jewish Publication Society, Philadelphia, 2003; from Khrizman et al. 2015: 200]

Khrizman et al. (2015) argued that in such cases *liter* is reinterpreted as a container whose contents measures 1 liter in volume (24).

- (21) $\lambda x.\text{CONTAINER}(x) \wedge \text{MILK}(\text{contents}(x)) \wedge \text{liter}(\text{contents}(x)) = 1$,
 CONTAINER is disjoint.
 the set of containers such that the contents is milk and measure 1 liter in volume

³In Russian, grams are sometimes used for volume; e.g., *sto gramm(ov) vodki* ‘100 grams of vodka’.

I do not adopt this for measure nouns, since unlike *liter* they have non-relational uses at type $\langle e, t \rangle$ (25), so the measure properties must apply to containers and not to contents. *Trexlitrovka* in (22a) can easily refer to an empty container, whereas *three liters* cannot (22b).

- (22) a. *Trex-litrov-ka skatilas' na pol i vdrebezgi razbilas'.*
 three-liter-KA.NOM.SG rolled on floor and to.pieces smashed
 'A three-liter jar rolled down to the floor and smashed to pieces.'
 b. *Three liters broke.
 Intended: 'A three-liter container/jar broke.'

4.2 Classifier uses

Count nouns denoting containers can be used in pseudo-partitive noun phrases such as *three glasses of water* allowing for two different interpretations. The first is a classifier use in which they are interpreted as relational nouns (24a). The second is a measure use in which they are interpreted as units of measure, analogously to inherent measures such as *liter* (24b) (Rothstein 2009; 2017, Landman 2004; 2016 for English; Partee & Borschev 2012, Khrizman 2016a,b for Russian).⁴

- (23) a. He handed me a glass of wine. container classifier
 $\llbracket \text{glass} \rrbracket_{\langle \langle e, t \rangle, \langle e, t \rangle \rangle} = \lambda P \lambda x. \text{GLASS}(x) \wedge \exists y [P(y) \wedge \text{CONTAINS}(x, y)]$
 b. There are/is two glasses of wine in this jar. measure unit
 $\llbracket \text{glass} \rrbracket_{\langle n, \langle e, t \rangle \rangle} = \lambda x. \text{MEAS}_{\text{GLASS UNITS}}(x) = n$

Count nouns have the same ambiguity in Russian, too (27) (see Partee & Borschev 2012; Khrizman & Rothstein 2015; Khrizman 2016a,b).

- (24) a. *On peredal mne stakan vod-y.*
 he passed me glass.ACC.SG water-GEN.SG
 'He handed me a glass of water.'
 b. *V kanistre ostalos' eshe dva tri stakan-a vod-y.*
 in jerrycan left still two three glass-GEN.SG water-GEN.SG
 'There are still two or three glasses of water left in the jerrycan.'

⁴Rothstein (2009; 2017) defines the meaning of containers in English using the 'CONTAIN(x, y)' relation. Partee & Borschev (2012) use 'FILLED WITH(x, y)' relation to interpret the parallel construction in Russian. For discussion see Partee & Borschev (2012) and Rothstein (2017).

If container complex measure nouns are genuine count nouns then we can ask whether they can be used as in pseudo-partitives, and if it is possible, we would expect them to be ambiguous between a classifier and a measure use, too. And this is the case. The examples in (28) illustrate a container classifier use. The semantic interpretations is then as follows in (29). *Trexlitrovka* shifts from the $\langle e, t \rangle$ sortal interpretation in (31b) to a relational interpretation in (26a). It combines with a complement *honey* and creates a predicate denoting the set of disjoint containers which have 3-liter holes and which are filled with honey (26b).⁵

- (25) a. *Kto-to razbil trex-litrov-ku med-a.*
 somebody broke three-liter-KA.ACC.SG honey-GEN.SG
 ‘Someone broke a three-liter jar of honey’ [shkolazhizni.ru]
- (26) a. $\llbracket \text{trexlitrovka} \rrbracket = \lambda P \lambda x. N_{\text{CONTAINER}(x)} \wedge \text{MEAS}_{\text{VOL LITER}}(\text{HOLE}(x)) = 3 \wedge \exists y[P(y) \wedge \text{FILLED WITH}(x, y)]$, $N_{\text{CONTAINER}_c}$ is disjoint.
 b. $\llbracket \text{trexlitrovka meda} \rrbracket = \lambda x. N_{\text{CONTAINER}_c}(x) \wedge \text{MEAS}_{\text{VOL LITER}}(\text{HOLE}(x)) = 3 \wedge \exists y[\text{HONEY}(y) \wedge \text{FILLED WITH}(x, y)]$, $N_{\text{CONTAINER}_c}$ is disjoint.
 the set of contextually determined three-liter containers filled with honey

The measure use is more complex. Measure nouns are not used naturally to express standard units of measure (30). In particular, *trexlitrovka* ‘three-liter jar’ is not used interchangeably with *tri litra* ‘three liters’ to measure out three-liter quantities of *N*. This is presumably expected, since a standard measure expression is available.

- (27) *Zalejte jagody tre-mja litr-ami / ?trex-litrov-koj*
 pour berries three-INS liter-INS.PL three-liter-KA.INST.SG
kipjatk-a.
 boiling.water-GEN.SG
 ‘Pour three liters of boiling water over the berries.’

But they *are* used as *ad hoc* measure units in approximative contexts (see Partee & Borschev 2012; Rothstein 2017); see (31). In (31), the precise volume of the jar is not directly relevant. The speaker uses the noun not because he knows that this volume corresponds to a certain amount of berries. Instead, the speaker uses the noun to express that he estimates that the amount of the berries on the bush

⁵The analysis in (29) is based on the analyses of Russian pseudo-partitives with container nouns such as *stakan* ‘glass’ on the classifier use proposed in Partee & Borschev (2012) and Khrizman (2016a,b). For details see the original papers.

is the amount which would fill a stereotypical three-liter jar. (32) illustrates a similar point.

- (28) *Context*: ‘This raspberry bush is full of berries!’
Da, zdes’ kak minimum odna polnaja trex-litrov-ka (jagod).
 yes here as minimum one full three-liter-KA.NOM.SG berry.GEN.PL
 ‘Oh, yes! There is at least one full three-liter jar of berries.’

- (29) *Context*: ‘They served wonderful pickled mushrooms at Masha’s wedding!’
Ja s’ela navernoe celuju trex-litrov-ku etix
 I ate probably whole three-liter-KA.ACC.SG this.GEN.PL
grib-ov.
 mushroom-GEN.PL
 ‘I guess I ate a whole three-liter jar of those mushrooms.’

I thus adopt Partee & Borschev’s semantics for containers on the *ad hoc* measure interpretation in which a free variable y is used to refer to a container (33). As a result, the interpretation makes reference to a three-liter container, but does not entail its existence.

- (30) a. $\llbracket \text{trexlitrovka}_{\text{measure}} \rrbracket$
 $= \lambda n \lambda x. \text{CONTAINER}_c(y_1) \wedge \text{MEAS}_{\text{LITER}}(\text{HOLE}(y_1)) = 3 \wedge x \text{ would fill } y_1 \text{ } n$
 times.
 b. $\llbracket \text{trexlitrovka}_{\text{measure}} \text{ jagod} \rrbracket$
 $= \lambda x. \text{BERRY PL}(x) \wedge \text{CONTAINER}_c(y_1) \wedge \text{MEAS}_{\text{LITER}}(\text{HOLE}(y_1)) = 3 \wedge x$
 would fill y_1 once.

the set of quantities of berries which would fill a stereotypical three-liter jar once

To conclude, complex measure nouns denoting containers just like other count nouns denoting containers can be used in complex NPs.⁶ (Notice that pseudo-

⁶ A reviewer notes that Czech has a similar construction but that complex measure nouns used as measure classifiers require plural count/mass complements, whereas inherent measure words are compatible with singular count complements. This contrast is absent in Russian where singular count nouns are not allowed in either case (see Khrizman 2014; 2016a):

(i) *tri kilogramma grib-ov* / *muk-i* / **grib-a*
 three kilo mushroom-PL.COUNT flour-SG.MASS mushroom-SG.COUNT
 ‘three kilos of mushrooms/flour’

partitives are distinct from true partitives; see Koptjevskaja-Tamm 2001.) As predicted, they have both a container classifier and a measure interpretation.⁷

In §5 I shall argue that the analysis also correctly predicts that the interpretational range of complex nouns includes portions.

5 Portion uses

We analyzed complex measure nouns as count predicates and assumed that countability requires disjointness, i.e. count denotations are disjoint denotations.

Khrizman et al. (2015) have shown that the range of count predicates includes expressions denoting disjoint quantities of substances, i.e. portions. Portions can be expressed by different constructions. One example is pseudo-partitives with container classifiers illustrated in (34). What is being drunk is beer and not glasses. However, *glass* cannot be interpreted as a unit of measure equal to one glass, since glasses of different size are involved. *Fifteen glasses of beer* then makes reference to fifteen portions of beer. Also there are expressions like in (35) which make reference to contextually determined portions without a container being involved.

-
- (ii) *tri banki / trex-litrov-ki grib-ov / muk-i /*
 three jars three-liter-KA.PL mushroom-PL.COUNT flour-SG.MASS
**grib-a*
 mushroom-SG.COUNT
 ‘three jars/three-liter jars of mushroom/flour’

⁷Partee & Borschev (2012) (following Pustejovsky 1993 on dotted-type objects) use a copredication test to show that container nouns in Russian can be used to refer to containers themselves and to their contents; see (i). A reviewer points out that if complex measure nouns name containers, they are expected to show the same behavior, i.e. appear in constructions in which the two meanings are coordinated. Example (ii) shows that this is indeed the case.

- (i) *On vypil stakan molok-a, kotoryj stojal na stole.*
 he drank glass.ACC.SG milk-GEN which stood on table
 ‘He drank the glass of milk that was standing on the table.’
 (Partee & Borschev 2012: 459)
- (ii) *On vzjal sto-grammov-ku vodk-i, kotoraja stojala na stole, i vypil ee zalpom.*
 he took 100-gram-KA.ACC.SG vodka-GEN which stood on table and drank it in.one.gulp
 ‘He took the 100-gram glass of vodka which stood on the table and drank it in one gulp.’

Notice, though, that I do not attempt to provide a dotted-type semantics for these expressions. For further discussion see Partee & Borschev (2012).

- (31) I drank fifteen glasses of beer, five flutes, five pints, and five steins. I drank five of the fifteen glasses of beer before my talk and the rest after it. (Khrizman et al. 2015: 202)
- (32) *Eén patat met, één zonder, en één met satésaus, alstublieft.*
 one french.fries with one without and one with peanut.sauce please
 ‘One french fries with [mayonnaise], one without, and one with peanut sauce, please.’ (Dutch, Khrizman et al. 2015: 200)

Khrizman et al. (2015) bring cross-linguistic evidence that portion expressions have properties of count predicates and give a formal analysis on which portion predicates denote sets of disjoint quantities of stuff and, therefore, are count.

If complex measure nouns are count predicates and portions are such, too, we predict that measure nouns can denote sets of disjoint portions with certain measure properties. For example, *stogrammovka* could be interpreted as making reference to individual portions which measure 100 grams (36).

- (33) $\llbracket \text{hundred-gram-ka} \rrbracket = \lambda x. \text{PORTION}_c \wedge \text{MEAS}_{\text{WEIGHT/VOL GRAM}}(x) = 100$
 PORTION_c is a property whose content is contextually determined.
 PORTION_c is disjoint.
 the set of contextually determined disjoint quantities (portions) which measure 100 grams in volume/weight

The prediction is borne out. *Frontovaja stogrammovka* illustrated in (37) is a very good example. It is used to refer to a 100-gram portion of vodka which used to be distributed daily to soldiers in the 1940s.

- (34) a. *front-ov-aja sto-grammov-ka*
 front-ADJ-F.SG 100-gram-KA.NOM.SG
 ‘a standard 100-gram portion of vodka for soldiers’
 b. *Prinjav... neskol’ko “frontovyx sto-grammov-ok”, general*
 having.taken few front 100-gram-KA.GEN.PL general
rasslabilsja, podobrel.
 relaxed became.kinder
 ‘Having drunk a few front 100-gram portions of vodka, the general got himself into a more relaxed and kind mood.’ [proza.ru]

Crucially, portion uses are productive. A Google search reveals a range of contexts in which *stogrammovka* is used to refer neither to containers nor to concrete objects but to abstract portions (38), (36).

- (35) *Context*: ‘We recommend to drink 200 grams of wine every day: one 100-gram portion in the afternoon and one 100-gram portion at night before going to bed.’
Dva raza v nedelju večernjuju sto-grammov-ku zamenite
two times in week evening 100-gram-KA.ACC.SG substitute
orexovo-medovym-vinnym koktejlem.
nut-honey-wine cocktail
‘Substitute the evening 100-gram portion with nut-honey-wine cocktail twice a week.’ [girls-in.ru]
- (36) *Situation*: calculating the caloric value of cooked dishes
Prikinula obščij ves i podelila na sto-grammov-ki.
estimated overall weight and divided on 100-gram-KA.ACC.PL
‘I estimated the overall weight and divided into 100-gram portions.’ [community.myfitnesspal.com]

6 Summary and implications

We have explored the semantics of complex measure nouns in Russian. I showed that complex measure nouns are not measure predicates expressing measure properties but genuine count nouns denoting sets of discrete entities. Assuming a disjointness-based semantics for count predicates following Rothstein (2010; 2011), Rothstein (2017), and Landman (2011; 2016), I argued that complex measure nouns are derived via a nominalization operation (expressed by the -KA suffix), which shifts intersective measure modifiers to predicates denoting disjoint entities that have the stated measure properties. We have seen that the proposed account correctly predicts that the range of possible interpretations of such nouns will include containers and free portions.

Aside from its intrinsic interest, this work contributes to our understanding of the semantics of measure in at least two ways: The first implication has to do with the semantics of measure phrases such as *three liters*. We have shown that complex measure nouns are best analyzed as being derived from intersective predicates. This supports the reality of measure predicates. In other words, the analysis brings evidence that measure pseudo-partitives such as *three liters of water* have the semantic composition in (37), with the numeral and the measure word forming a semantic unit which intersectively modifies the complement as argued in Rothstein (2009; 2011; 2017) and Landman (2004; 2016).

(37) (THREE ◦ LITERS) ∩ WATER

We have also shown that -KA in measure nouns shifts non-count expressions to genuine count nouns. Crucially, -KA can be an explicit individuator which attaches to mass nouns and creates count predicates (Khrizman 2017) (38), (39).⁸ This supports analyses which treat measure expressions like *three liters* explicitly as mass expressions such as Khrizman et al. (2015) and Landman (2016).

- (38) a. *šokolad* – *šokolad-ka*
 chocolate chocolate-KA.NOM.SG
 ‘chocolate – a bar of chocolate’
 b. *železo* – *želez-ka*
 iron iron-KA.NOM.SG
 ‘iron – a piece of iron’
- (39) a. *pjat’ šokoladok/* #*šokoladov*
 five chocolate.KA.GEN.PL chocolate.GEN.PL
 ‘five bars of chocolate’
 b. *pjat’ železok/* #*želez*
 five iron.KA.GEN.PL iron.GEN.PL
 ‘five pieces of iron’

The second implication relates to the shifting mechanism in the counting and measuring expressions. It is well known that count nouns can shift to denote units of measure. Such shifts, as already mentioned in §4, occur in container nouns (Doetjes 1997; Landman 2004; Rothstein 2009 and others) as well as in other sortal nouns (40) (Rothstein 2017):

- (40) a. “That’s about two busloads of people dying every day ...”
 b. “...nine tablefuls of guests gathered for a Cantonese-inspired dinner banquet ...”
 c. I have two classes (worth) of material prepared. (Rothstein 2017: 216f.)

⁸Here, -KA is used as a diminutive suffix. It has been shown that diminutive suffixes in Russian can function as individuating operators which attach to mass nouns and create count predicates as illustrated in (38) and as measure operators which assign measure properties to entities expressed by mass and count nouns and do not induce grammatical individuation (*dom* – *domik* ‘a house – a small house’, *dožd* – *doždik* ‘rain – light rain’) (Khrizman 2017; 2019). Crucially, some suffixes, with -KA being among them, are ambiguous between the two uses (e.g., *šokolad* – *šokoladka* ‘chocolate – a bar of chocolate’ vs. *noga* – *nožka* ‘a leg – a small leg’) (Khrizman 2019).

Shifts from count nouns to measures have been well studied. They are productive semantic operations which occur in many languages including Hebrew (Rothstein 2009), Mandarin (Li 2013), Hungarian (Schvarcz 2014), and Russian (Partee & Borschev 2012; Khrizman 2016a,b). In some of these languages there are dedicated morpho-syntactic means to express such shifts, e.g. the *-nyi* suffix in Hungarian (Schvarcz 2014; 2017).

However, the converse shift, i.e. measure-to-count shifts have been neither studied nor described sufficiently. We have shown here that complex measure nouns in Russian instantiate a grammaticalization of such a shift which brings evidence that at least in some languages measure-to-count shifts are also linguistically real, productive operations.

Abbreviations

ACC	accusative	M	masculine
ADJ	adjective	NEG	negation
F	feminine	NOM	nominative
GEN	genitive	PL	plural
INS	instrumental	SG	singular

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Chapter 8

Silent HAVE needs revisiting: (Non-)possessive meanings with transitive intensional ‘need’ in Russian

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I discuss two ‘need’ + NP constructions in Russian, namely (i) the more basic construction with a nominative theme and (ii) the underdescribed, highly colloquial construction with an accusative theme. Building on work on the semantics of possessive constructions, I show that the two constructions differ as to which semantic relations they can express. Specifically, the nominative construction can not only express the control relation (the most prototypical possessive relation), but also a variety of others, whereas the accusative construction is restricted to the control relation, as manifested in the animacy and concreteness restrictions associated with it. Based on previous work on intensional transitive verbs, I analyze both constructions as involving a concealed clausal complement with a silent HAVE but extend this analysis by assuming that HAVE selects an NP complement via a syntactically represented type-shifting operator, which encodes the respective semantic relations expressed in the construction. I further argue that the accusative construction incorporates the type-shifter for the control relation, thus accounting for its selectional restrictions, and tentatively suggest that this might also explain the accusative marking. Finally, I report the results of three acceptability rating studies testing the animacy and concreteness restrictions in the accusative construction.

Keywords: intensional transitive verbs, possession, case alternation, Russian, experimental syntax

1 Introduction

In standard Russian, ‘need’ with a nominal complement (compare to English *I need a book*) is typically realized by the adjectival predicate *nužen* ‘necessary’,



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which takes a dative subject and a nominative theme controlling the number and gender agreement on the predicate (henceforth, the ‘need’ + NOM construction), as shown in (1a). In colloquial registers, ‘need’ can also occur with accusative (sometimes genitive) themes without any clear truth-conditional difference, as shown in (1b). In this case ‘need’ is realized by the non-agreeing (adverbial) form *nužno*, identical to the neuter singular form, or by the non-inflecting impersonal predicate *nado* (henceforth, the ‘need’ + ACC construction).¹

- (1) a. *Mne nužn-a knig-a.* ‘need’ + NOM
 me.DAT necessary-F.SG book-NOM.SG
 ‘I need a book.’
 b. *Mne nužno / nado knig-u.* ‘need’ + ACC
 me.DAT necessary.ADV necessary.ADV book-ACC.SG
 ‘I need a book.’

ACC marking on the theme in the ‘need’ + ACC construction alternates with genitive marking for mass and plural nouns, as well as for some abstract nouns like ‘love’, ‘happiness’, etc., especially under negation, as shown in (2). Henceforth, I will disregard examples with genitive marking and only discuss examples with ACC themes.

- (2) a. *Mne nado vod-y / sčast’-ja.*
 me.DAT necessary.ADV water-GEN.SG happiness-GEN.SG
 ‘I need water/happiness.’
 b. *Mne ne nužno vod-y / podark-ov.*
 me.DAT NEG necessary.ADV water-GEN.SG present-GEN.PL
 ‘I do not need water/presents.’

The ‘need’ + NOM construction is stylistically neutral and is by far more frequent than the ‘need’ + ACC construction, which is highly colloquial and is sometimes considered non-standard by native speakers. Nevertheless, the ‘need’ + ACC construction occurs with a non-negligible frequency in the corpus.² There are further pragmatic differences between the two constructions, having to do with the subjective component in the meaning of ‘need’ + ACC. I disregard these differences in this paper (but see Knyazev 2020).

¹In what follows, *nužno* and *nado* are glossed as ‘adverbial’ (ADV) to highlight their non-verbal character, without any theoretical implications.

²In a study based on the Russian National Corpus (RNC; <http://www.ruscorpora.ru>), I found 54 examples of ‘need’ + ACC with *nužno* and 223 examples with *nado* in the texts written after 1950. The results of this study are discussed in Knyazev 2020.

The ‘need’ + ACC construction has been briefly discussed in the literature (see, e.g., Švedova 1980: 325–327, Pesetsky 1982: 213, Mikaelian & Roudet 1999: 28), mostly in connection with other ACC-assigning non-verbal predicates in Russian such as *žal* ‘(it is a) pity’, *vidno* ‘(it is) visible’, *slyšno* ‘(it is) audible’, and some others. To my knowledge, however, it has not received a detailed analysis so far and has never been systematically contrasted with the ‘need’ + NOM construction. Most strikingly, it is not mentioned in Harves (2008) and Harves & Kayne (2012), which specifically address Russian ‘need’ with a nominal complement, a point to which I return in §4.2.

In Knyazev (2020), I discussed the semantic/distributional differences between the ‘need’ + NOM and the ‘need’ + ACC constructions, suggesting that ‘need’ + ACC has a more restricted distribution. Specifically, I argued that ‘need’ + ACC is restricted to the expression of concrete human possession, namely possession of concrete (manipulable) objects by human beings (which is sometimes metaphorically extended to abstract objects), which I referred to as the CONCRETENESS and the ANIMACY RESTRICTIONS. By contrast, the ‘need’ + NOM construction can express a wide variety of relations, including those that are not typically associated with possession.

In this paper, I review some of these findings but also situate them in a larger theoretical context, namely the literature on intensional transitive verbs, including, in particular, Harves (2008) (and, to a smaller extent, Harves & Kayne 2012), which is specifically dedicated to ‘need’ + NP in Russian. My goal is to show how these findings lead to a revision of the silent HAVE analysis proposed by Harves (2008) for the ‘need’ + NOM construction and also how this analysis can be extended to the ‘need’ + ACC construction (which Harves does not discuss), in a way that can capture its semantic restrictions.

The account I propose heavily relies on the recent semantic account of the English transitive ‘need’ construction proposed in Zaroukian & Beller (2013) (which is, in turn, strongly influenced by Vikner & Jensen 2002). The particular importance of Zaroukian & Beller (2013) is that it explicitly deals with the semantic variability in transitive ‘need’ (which is rarely discussed in the literature) as well as proposes a compositional account of this variability.

The second goal of this paper is to present the results of three formal acceptability judgment studies aimed at investigating the proposed animacy and concreteness restrictions using methods of experimental syntax (see Sprouse & Hornstein 2013). Somewhat unexpectedly, these studies failed to provide direct support for the hypothesized restrictions. I offer some speculations as to why these negative results might have been obtained and make some methodological suggestions for future research.

The paper is structured as follows: In §2, I give an overview of the discussion of the ‘need’ + NP construction in the literature on intensional transitive verbs, starting from the ‘standard’ silent HAVE analysis of ‘need’ + NP (§2.1), then turning to some problematic examples with apparently non-possessive relations (§2.2) and, finally, presenting Zaroukian & Beller’s (2013) semantic account of ‘need’ + NP (§2.3). In §3, I turn to the ‘need’ + NOM construction in Russian, first briefly presenting Harves’s (2008) account (§3.1), then discussing semantic relations expressed in this construction (§3.2), and, finally, presenting my own account of ‘need’ + NOM. In §4, I discuss the ‘need’ + ACC construction in Russian, first focusing on its semantic restrictions (§4.1) and then presenting my account of these restrictions (§4.2). §5 discusses the experimental studies. §6 concludes the paper.

2 Previous research on the ‘need’ + NP construction

2.1 A silent HAVE/GET account

In generative approaches, ‘need’ with a nominal complement (henceforth transitive ‘need’ or the ‘need’ + NP construction), as in *Bill needs a beer*, is usually analyzed, along with *want*, *seek*, *fear*, and a handful of other verbs, as a so-called INTENSIONAL TRANSITIVE VERB, i.e., as a verb whose nominal complement has some semantic properties associated with clausal complements, jointly referred to as “intensional” (see den Dikken et al. 2018 and Schwarz 2006, among others). For example, transitive ‘need’ shows lack of existential import of its complement, as shown in (3a), just as what we observe with the clausal complement of ‘need’, as in (3b), but not with non-intensional transitive verbs like ‘drink’, as in (3c). Transitive ‘need’ also shows lack of falsity of non-referring terms, as in (4a), cf. (4b) and (4c).³

- (3) a. Bill needs a beer. \nRightarrow There is a beer (in the relevant context).
(Schwarz 2006: 259)
 b. Bill needs to drink a beer. \nRightarrow There is a beer (in the relevant context).
 c. Bill is drinking a beer. \Rightarrow There is a beer (in the relevant context).

³Another intensional property often attributed to ‘need’ is its failure to preserve truth under substitution of co-referring terms (see den Dikken et al. 2018; Harves 2008). However, as pointed out by Forbes (2020), this property does not generally hold for ‘need’ (at least in its non-psychological sense), cf. *Bill needs water* (= H₂O).

(4) Assuming that there is no such thing as a 40% beer:

- a. Bill needs a 40% beer.
- b. Bill needs to drink a 40% beer.
- c. # Bill is drinking a 40% beer.

The intensional properties of transitive ‘need’ and other intensional transitive verbs are typically accounted for by analyzing their complement as underlyingly clausal (see, e.g., [den Dikken et al. 2018](#); [Harves 2008](#)). Specifically, it is argued that transitive ‘need’ (and also transitive ‘want’) takes a concealed clausal complement headed by a silent possessive verb (HAVE), as shown in the structure (5a) for (3a).⁴ The presence of silent HAVE in (5a) receives support from the general availability of paraphrases with overt *have* for examples with transitive ‘need’, see the paraphrase in (5b) for (3a), suggested in [Schwarz \(2006: 259\)](#).

- (5) a. Bill needs [PRO/*t* HAVE a beer].
- b. Bill needs to have a beer.

Three questions arise in connection with the analysis in (5a), in increasing order of specificity: (a) Does the complement of transitive ‘need’ always have a possessive meaning? (b) Is the possessive meaning in the complement of transitive ‘need’ syntactically represented (as a silent head)? (c) Is this silent head (if it exists) necessarily HAVE? All three questions have been addressed in the literature on intensional transitive verbs.

Starting from question (b), there has been a general consensus that the possessive meaning associated with transitive ‘need’ (at least in English) must be encoded as a silent predicative head, thereby rendering examples like (3a)–(5a) biclausal (see, e.g., [den Dikken et al. 2018](#); [Schwarz 2006](#); [Marušič & Žaucer 2006](#); [Harves 2008](#); [Zaroukian & Beller 2013](#)).^{5,6} This analysis has been supported by a number of biclausality diagnostics, most prominently by adverb ambiguities, as shown in (6). For example, in (6) the before-phrase can modify not only the

⁴Whether transitive ‘need’ takes a control or a raising complement (or perhaps either one) is an open question in the literature (see, e.g., [Schwarz 2006](#); [Harves 2008](#)). The same applies to the question about the syntactic category of its complement. In this paper I remain agnostic about these potentially important questions.

⁵See also [Pylkkänen \(2008\)](#) for an interesting discussion of this issue in the context of psycholinguistic experiments of complement coercion.

⁶[Marušič & Žaucer \(2006\)](#) discuss some unresolved problems of the silent head (verb) analysis. In their view, however, these problems do not threaten the overall validity of this analysis. The reader is referred to their work for further details.

matrix clause, as in (6a), but also the implicit possessive predication, as in (6b). The latter reading is naturally accounted for if there is a suitable attachment site for the before-phrase, e.g., a lower VP/vP projection.⁷

- (6) Matt needed some change before the conference.
- a. There was a time before the conference at which Matt needed some change.
 - b. Matt's need is to have some change before the conference.
- (Schwarz 2006: 261)

As to question (c), there has been some debate in the literature concerning the nature of the silent possessive head. In the earlier work, it was identified as HAVE (see, e.g., den Dikken et al. 2018 and also Fodor & Lepore 1998 as a precursor). However, Harley (2004) pointed out examples with transitive 'need'/'want' that only allow a paraphrase with *get* but not with *have*, as in (7) (see also Harves 2008). This led her to propose a unified structure for (3a) and (7) involving a silent prepositional head (P_{HAVE}), which, according to her view, underlies both overt *have* and *get* (see, e.g., Harley 2002). However, Marušič & Žaucer (2006) convincingly argue against this analysis on the basis of the fact that temporal adverbials cannot modify PPs, see (6), and some other facts. Instead, they propose that the silent possessive head in question must be either HAVE or GET (see also Harves 2008 and Zaroukian & Beller 2013 for an endorsement of this view).

- (7) I need (to get/#have) a kiss/a compliment. (Harves 2008: 215)

Harves (2008) further argues that the range of silent possessive verbs in constructions with transitive 'need'/'want' cross-linguistically must also include (possessive) BE (see also Harves & Kayne 2012). Her argument is based on the existence of transitive 'want' and the 'need' + NP construction in languages like Russian, where there is no basic transitive verb of possession ('have') but the respective constructions still have a possessive interpretation, as shown in (8a) and (8b).⁸

- (8) a. *Maš-a xočet mašin-u.*
 Masha-NOM.SG wants car-ACC.SG
 'Masha wants (to have) a car.'

⁷Other diagnostics include, but are not limited to, *too/again* ambiguities and the scope of quantifiers and negation. The reader is referred to the work cited above for more details.

⁸The verb *imet'* 'have' in Russian cannot be considered a "basic" verb of possession as it is mostly used in fixed expressions or with abstract possessors. Otherwise it is restricted to the expression of (permanent) ownership (see footnote 4 in Harves & Kayne 2012 and also Stolz et al. 2008: 440ff.).

- b. *Maš-e nužn-a mašin-a.*
 Masha-DAT.SG necessary-F.SG car-NOM.SG
 ‘Masha needs (to have) a car.’

In contrast to questions (b) and (c), question (a), as to whether transitive ‘need’ always expresses possession, has received relatively little attention in the literature, which has largely presupposed that the construction has a possessive meaning. In order to answer this question, one would need some clarification of the relevant notion of possession. These issues have been addressed in the work of Schwarz (2006) and Zaroukian & Beller (2013), to which I now turn.

2.2 Non-possessive examples with transitive ‘need’

Schwarz (2006) noted that there are examples of transitive ‘need’ such as (9) which do not have a possessive meaning. He argued that (9) and similar examples involve an unspecified contextually supplied relation *R* (interpreted in this particular case as ‘run’ or ‘participate’) rather than a possessive relation like HAVE/GET.⁹ Examples like (9) appear to threaten a uniform silent HAVE/GET analysis of transitive ‘need’.

- (9) John needs (to #have/#get) a marathon. (Schwarz 2006: 272)

Similar problems are presumably posed by other kinds of non-possessive examples with transitive ‘need’, although, to my knowledge, they have not been discussed in the relevant literature (including Schwarz 2006). First of all, there are examples with ‘passive’ or so-called retroactive deverbal nominals (see, e.g., Safir 1991; Roeper 2000) illustrated in (10a)–(10c). In these examples, the subject is construed as the internal argument of the deverbal nominal (observe the paraphrases with passive infinitives). Thus, the understood relation associated with these examples can be taken to be the theme/patient relation (in the neo-Davidsonian sense) rather than a possessive relation, as in cases like (3a). Interestingly, examples with passive/retroactive nominals sometimes have paraphrases with an overt *have/get*; see (10a). However, this seems to be an accidental property of the specific examples rather than a necessary feature of the construction.

⁹Schwarz (2006) further argues that there is no evidence for the syntactic representation of the relation *R* based on some biclausality diagnostics. He tentatively concludes that the non-possessive variety of transitive ‘need’ requires a monoclausal analysis, where the relation *R* arises via pragmatics. Although this is an important issue, I leave the discussion of this aspect of Schwarz’s (2006) proposal for future research; see also footnote 17.

- (10) a. Individuals need help (= to be helped / get help).
b. The leadership needs discussion (= to be discussed).
c. The disease needs prevention (= to be prevented). (Roeper 2000: 306)

Apart from the problematic examples with passive/retroactive deverbal nominals, there are also examples with ‘active’ deverbal nominals such as (11a) and (11b), where the subject is construed as the external argument of the deverbal nominal. In principle, Schwarz’s (2006) example (9) from above could also be analyzed along these lines assuming that the non-derived nominal *marathon* stands proxy for an ‘active’ deverbal nominal like *running*. Again, even though possessive paraphrases are possible in (11a) and (11b), the subject here is more appropriately analyzed as standing in the agent/undergoer relation to the object (i.e., the deverbal nominal) rather than in a possessive relation.

- (11) a. John needs rest (= to rest/to have a rest).
b. John needs a nap (= to nap/to have a nap).

I will jointly refer to the non-possessive relations expressed in the examples with passive/retroactive and active deverbal nominals in (10) and (11) as the **THEMATIC RELATION**, reflecting the fact that it corresponds to one of the theta-roles involved in the construal of the subject of transitive ‘need’.

The other kind of relation expressed in constructions with transitive ‘need’ which is not manifestly possessive is illustrated in examples like (12a)–(12c). In these examples, the subject argument is typically inanimate or understood in physical terms (i.e., as a body), whereas the object argument is typically a mass noun expressing some material substance or a more abstract resource which is required by the subject argument for proper functioning. Again, while paraphrases with overt *have/get* are often possible, the subject argument stands in the **REQUIREMENT RELATION** rather than in a possessive relation.

- (12) a. Muscles need energy (= to get energy).
b. You need calcium (= to get calcium).
c. Plants need light (= to get light).

The non-possessive examples discussed above appear to suggest that a uniform possessive analysis of transitive ‘need’ cannot be maintained. It turns out, however, that a more careful modelling of the possessive meaning in the transitive ‘need’ construction may open the way to subsume the non-possessive examples in (9)–(12) under the uniform silent **HAVE/GET** analysis. I now turn to the account of Zaroukian & Beller (2013), who have recently proposed such a model.

2.3 Zaroukian & Beller on semantic variability of silent HAVE

Zaroukian & Beller (2013) propose a typology of constructions involving silent HAVE which includes not only transitive ‘want’ and ‘need’ (treated as a single class), but also evaluative verbs such as *like* and *enjoy* with concealed complements (e.g., *John likes (to have) a cookie after dinner*) as well as double object constructions with *get* and *give* and, finally, overt *have*.

According to their typology, there are four types of silent HAVE which differ along two independent dimensions: (a) whether silent HAVE is static or telic (i.e., has a time interval argument) and (b) whether it is syntactically verbal (and thus leading to a biclausal structure) or prepositional (leading to a monoclausal structure). I will not dwell on all aspects of Zaroukian & Beller’s (2013) proposal. What is important for my purposes is their analysis of sentences with overt *have* and transitive ‘want’/‘need’. Specifically, I will focus on two aspects, namely (a) the semantic variability of silent HAVE and (b) the compositional analysis of this variability.

Starting from question (a), Zaroukian & Beller (2013) essentially extend Vikner & Jensen’s (2002) account of the English ’s genitive to the constructions with silent HAVE listed above. In particular, they argue that overt *have* and transitive ‘want’/‘need’ (with minor exceptions) can express a number of diverse semantic relations, namely, the control, part-whole, inherent, typical-use, and agentive relations. These relations, illustrated in (13a)–(13e), are discussed immediately below.¹⁰

The control relation, illustrated in (13a), is perhaps most prototypically associated with possession. It is defined as “the relation which holds between an animate being X and an item Y which X has at his or her disposal, being able to use or handle it” (Vikner & Jensen 2002: 196–197). As can be seen, the control relation is not limited to ownership, which is typically viewed as the most prototypical possessive notion in the functional-typological literature (see, e.g., Heine 1997), but also includes physical and temporary possession.¹¹

¹⁰Zaroukian & Beller also mention the (contextually supplied) pragmatic relation (R) but do not discuss it in any detail. In what follows, I will not deal with this relation.

¹¹The control relation is illustrated by the following quote from Vikner & Jensen:

In the case of the girl’s car, the girl may control the car because she owns it, or because she has borrowed it, or because she has hired it, or because she is driving it, or because she is sitting in it, and so on. In the case of, say, a stone, one may control a stone by holding it in one’s hand, by having it within reach, by owning it, etc. (Vikner & Jensen 2002: 196–197)

The inherent relation, illustrated in (13b), is expressed in constructions with kinship terms and other inherently relational nouns like ‘teacher’. The three remaining relations (part-whole, typical-use, and agentive) are specified by the so-called qualia structure of the object noun, namely the CONSTITUTIVE (i.e., the relation between an object and its constituents or proper parts), TELIC (i.e., purpose or function of the object), and AGENTIVE QUALE (i.e., factors involved in the origin or “bringing about” of an object), as discussed in Pustejovsky (1995).

The part-whole relation, illustrated in (13c), is more or less straightforward. Along with the inherent relation, it corresponds to inalienable possession (see Heine 1997). The typical-use relation, illustrated in (13d), specifies how a given object is typically used (for example, cookies are typically used for eating, etc.).¹² The agentive relation, illustrated in (13e), holds between a created thing and its creator; this relation is only expressed with overt *have* but not with transitive ‘need’.¹³

- | | | |
|------|-------------------------------------------------------------------------------------------------------|-------------|
| (13) | a. The girl has / needs a car.
≈ has a car at her disposal / needs a car to be at her disposal | control |
| | b. The girl has / needs a teacher
≈ is / needs to be in a teacher-student relation | inherent |
| | c. The girl has / needs a (new) nose.
≈ has a nose as part of her / needs a nose to be part of her | part-whole |
| | d. The girl had / needs a cookie.
≈ ate a cookie / needs to eat a cookie | typical-use |
| | e. The girl has / needs a poem.
≈ has created a poem / #needs to create a poem | agentive |

Now, let’s turn to question (b) concerning the compositional analysis of the examples in (13a)–(13e). First of all, Zaroukian & Beller (2013) assume that examples with transitive ‘need’ involve a concealed complement clause with silent HAVE. They also assume that silent HAVE and overt *have* have the same denotation.

¹²Zaroukian & Beller (2013) observe that the typical-use relation is restricted to “consumable” objects in both constructions.

¹³Zaroukian & Beller (2013) speculate that the agentive relation is incompatible with transitive ‘want’/‘need’ constructions because they typically convey a displacement in time between the subject and the object, whereas the creation process requires some span of time, in which the subject controls (an early stage of) the object. I will tentatively assume Zaroukian & Beller’s explanation for the incompatibility of the agentive relation with the ‘need’ + NP construction in the subsequent discussion of the Russian data.

Specifically, they analyze HAVE/have as a (higher-order) relation that takes an individual and another relation (supplied by the complement) and returns a truth value, as schematized in (14).¹⁴

$$(14) \quad \llbracket \text{HAVE} \rrbracket = \lambda R_{\langle e, \langle e, t \rangle \rangle} \lambda y_e [\exists x [R(y)(x)]] \quad (\text{Zaroukian \& Beller 2013: 649})$$

An important assumption of Zaroukian & Beller's analysis is that the complement of have/HAVE must be of type $\langle e, t \rangle$ (relation). This does not create a problem for examples with the inherent relation such as (13b), since the relevant $\langle e, t \rangle$ -type expression is supplied by the object noun itself, which is inherently relational. In case of the other kinds of relations, where the object noun is non-relational, the noun must be coerced into a relational denotation.

Zaroukian & Beller (2013) assume, following Vikner & Jensen (2002), that this is achieved by using various type-shifting operators, corresponding to one of the remaining semantic relations in (13). For example, the type-shifter corresponding to the agentive relation is shown in (15a), where the Q_A stands for the function that returns the relation supplied by the agentive quale of the relevant noun.¹⁵ For the noun *poem* in (13e), it will return the $\langle e, t \rangle$ -type expression given in (15b). The part-whole and typical-use relations are analyzed in a similar way.

$$(15) \quad \begin{array}{ll} \text{a. For any } W \text{ (of type } \langle e, t \rangle \text{),} \\ \quad \text{Ag}(W) = \lambda y \lambda x [W(x) \& Q_A(W)(x)(y)] & (\text{Vikner \& Jensen 2002: 209}) \\ \text{b. Ag}(\llbracket \text{poem} \rrbracket) = \lambda y \lambda x [\text{POEM}(x) \& \text{COMPOSE}(x)(y)] \end{array}$$

As for the control relation, shown in (16), it does not depend on the qualia structure of a word but directly on the predicate CONTROL, whose meaning corresponds to Vikner & Jensen's (2002) definition cited above (see page 193).

$$(16) \quad \text{Ctr}(W) = \lambda y \lambda x [W(x) \& \text{CONTROL}(x)(y)] \quad (\text{Vikner \& Jensen 2002: 210})$$

The compositional process is illustrated (on the basis of the verb phrase *have a car*) in Figure 1, adapted from Zaroukian & Beller (2013).¹⁶

¹⁴ More precisely, the denotation in (14) is for static HAVE, which lacks a time-interval argument. The denotation for telic HAVE, which is equivalent to Marušič & Žaucer's (2006) silent GET and its prepositional counterpart, is given in (i). I will largely ignore the difference between static and telic HAVE, since this difference becomes relevant only in Zaroukian & Beller's account of the double object construction and the construction with evaluative verbs, which I do not discuss in this paper.

(i) $\llbracket \text{HAVE} \rrbracket = \lambda R_{\langle e, \langle e, \langle s, t \rangle \rangle \rangle} \lambda y_e \lambda i_s [\exists x [R(y)(x)(i)]]$ (Zaroukian & Beller 2013: 648)

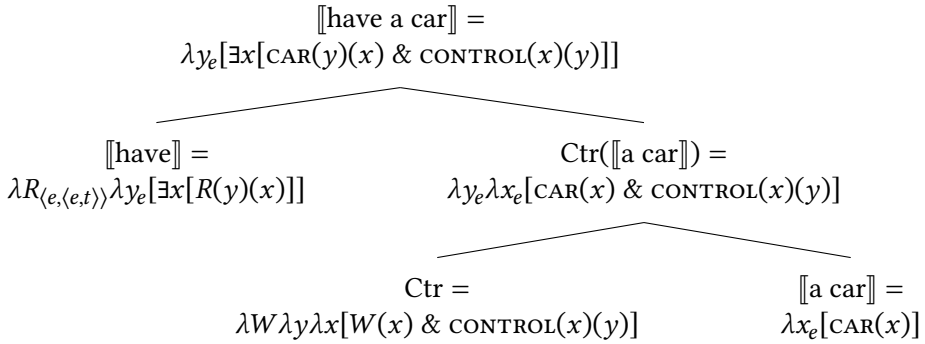


Figure 1: The compositional analysis of *have a car* in Zaroukian & Beller (2013)

The crucial feature of Zaroukian & Beller’s (2013) account is that the semantic variability of constructions with silent HAVE is captured by way of using various type-shifting operators, whereas HAVE itself is analyzed as an abstract linking element, which is in principle compatible with any kind of relational meaning. This potentially allows to accommodate the non-possessive examples of transitive ‘need’ discussed in §2.2 without necessarily discarding a uniform silent HAVE analysis. Although Zaroukian & Beller do not discuss problematic examples like (9) and examples with the thematic and the requirement relations in (10), (11), and (12), their analysis can potentially be extended to these examples. For example, the thematic relation and presumably examples like (9) can be subsumed under the inherent relation. Similarly, examples with the requirement relation, as in (12a)–(12c), could arguably be viewed as a special case of the part-whole relation (i.e., as relations specified by the constitutive quale). This suggests that a silent HAVE analysis for transitive ‘need’ can still be maintained in view of the considerable semantic variability of these constructions.¹⁷

¹⁵Vikner & Jensen’s notation has been slightly adapted.

¹⁶Zaroukian & Beller assume, without explicit discussion, that the type-shifting operators are represented in the syntactic structure (as silent heads). This assumption will become relevant for my analysis of the Russian data to be discussed below.

¹⁷Note also that the absence of evidence for biclausality for ‘non-possessive’ examples, as discussed by Schwarz (2006), see footnote 9, could potentially be explained by assuming that silent HAVE is prepositional in this case. A more detailed investigation of this issue is left for future work.

I will largely follow Zaroukian & Beller's (2013) analysis of silent HAVE in my account of the two 'need' + NP constructions in Russian, to which I now turn.

3 The 'need' + NOM construction

3.1 Harves' account of 'need' + NOM

As we saw in the introduction, Russian has two 'need' + NP constructions, illustrated in (17a) and (17b). To my knowledge, the only discussion of 'need' + NP in Russian within the context of intensional transitive verbs is found in Harves (2008), which is only concerned with the 'need' + NOM construction.¹⁸ Interestingly, the 'need' + ACC construction is mentioned neither in Harves (2008) nor Harves & Kayne (2012), which is specifically dedicated to transitive/ACC-assigning 'need'.

- (17) a. *Mne nužn-a mašin-a.* 'need' + NOM
 me.DAT necessary-F.SG car-NOM.SG
 'I need a car (to be at my disposal).'
- b. *Mne nužno / nado mašin-u.* 'need' + ACC
 me.DAT necessary.ADV necessary.ADV car-ACC.SG
 'I need a car (to be at my disposal).'

Harves (2008) proposes to analyze the 'need' + NOM construction along the lines of English transitive 'need'. Based on adverb ambiguities, as shown in (18b), she argues that the construction involves a silent possessive verb which she identifies as BE (or GET), assuming that Russian lacks silent HAVE (see footnote 8).

- (18) *Ivan-u byli nužn-y den'g-i do sobranija.*
 Ivan-DAT.SG were.PL necessary-PL money-NOM.PL before meeting.
 'Ivan needed some money before the meeting.'
- a. 'There was a time before the meeting at which Ivan needed some money.'
- b. 'Ivan's need was to have some money before the meeting.'
- (Harves 2008: 216)

Harves (2008) does not discuss semantic variability in the 'need' + NOM construction, all her examples being of the control type (see previous section). This is the topic to which I now turn.

¹⁸The construction itself has been noted in the literature, as I mentioned in the introduction.

3.2 Semantic variability of ‘need’ + NOM

We have already seen examples of the ‘need’ + NOM construction with the control relation, such as (17a). As we can see in (19a)–(19c), the construction is also compatible with the inherent, part-whole, and typical-use relations, just like English transitive ‘need’, cf. (13b)–(13d). Similarly to English ‘need’, ‘need’ + NOM is also incompatible with the agentive relation, as shown in (19d), see (13e).

- (19) a. *Maš-e nužen recenzent.* inherent
 Masha-DAT.SG necessary.M.SG reviewer.NOM.SG
 ‘Masha needs a reviewer (= to be in a reviewer-reviewee relation).’
 b. *Vas-e nužen novyj nos.* part-whole
 Vasja-DAT.SG necessary.M.SG new nose.NOM.SG
 ‘Vasja needs a new nose (to be part of him).’
 c. *Maš-e nužn-a sigaret-a.* typical-use
 Masha-DAT.SG necessary-F.SG cigarette-NOM.SG
 ‘Masha needs a cigarette (= to smoke a cigarette).’
 d. # *Maš-e nužen tort.* agentive
 Masha-DAT.SG necessary.M.SG cake.NOM.SG
 ‘Masha needs (#to bake) a cake.’

In addition, the ‘need’ + NOM construction is also compatible with the thematic relation, whether expressed by active nominals, as in (20a), see (11), or by passive/retroactive nominals, as in (20b), see (10), and with the requirement relation, as in (21a) and (21b), see (12).

- (20) a. *Maš-e nužen otdyx / son.* thematic
 masha-DAT.SG necessary.M.SG rest.NOM.SG sleep.NOM.SG
 ‘Masha needs rest/sleep.’
 b. *Maš-e nužn-a pomošč’ / gospițializaci-ja.*
 masha-DAT.SG necessary-F.SG help.NOM.SG hospitalization-NOM.SG
 ‘Masha needs help/hospitalization.’
 (21) a. *Myšč-am nužn-a ėnergi-ja.* requirement
 muscle-DAT.PL necessary-F.SG energy-NOM.SG
 ‘Muscles need energy.’
 b. *Rasten-i-ja nužen svet.*
 plant-DAT.PL necessary.M.SG light.NOM.SG
 ‘Plants need light.’

Now, let's turn to the analysis of the 'need' + NOM construction in Russian.

3.3 Analysis of 'need' + NOM

In view of the semantic similarity between 'need' + NOM in Russian and transitive 'need' in English, I will extend Zaroukian & Beller's (2013) account of the latter construction to the analysis of 'need' + NOM.

Following Harves (2008), I assume that the 'need' + NOM construction in Russian is biclausal, containing a silent possessive verb BE. I further assume that silent BE and HAVE are semantically identical and differ only syntactically, as, e.g., in the influential analysis proposed by Freeze (1992), where 'have' is universally the result of incorporation of a locative preposition into 'be'. Given the last assumption, I will assume the same denotation for silent BE as proposed by Zaroukian & Beller (2013) for silent HAVE, which we saw in (14) above.¹⁹ I also follow their account of the variability of silent HAVE in terms of type-shifting operators.

The simplified structure for 'need' + NOM is given in Figure 2.²⁰ One important assumption about this structure that I am making is that type-shifting operators are explicitly represented in the syntax (if present).²¹ This assumption, which will be relevant for my account of 'need' + ACC to be presented in §4.2, is consistent with recent syntactic theorizing about the syntax-semantics interface. Specifically, it is explicit in approaches which postulate silent determiners in "determiner-less" languages on the basis of semantic arguments (i.e., to avoid type mismatch). Thus, for instance, Ramchand & Svenonius (2008) reject purely semantic type-shifting operators as proposed by, e.g., Chierchia (1998).²² These approaches assume that type-shifting operators that create type *e* denotation for noun phrases are syntactically represented as silent determiners. Similarly, we may assume that type-shifting operators that create type $\langle e, \langle e, t \rangle \rangle$ (relational) denotations for sortal $\langle \langle e, t \rangle \rangle$ noun phrases are also syntactically represented.

The last assumption will be crucial for my analysis of the 'need' + ACC construction, to which I now turn.

¹⁹As for silent GET, which, according to Harves (2008), can also be present in the 'need' + NOM construction, I assume that it is the telic version of HAVE/BE (see footnote 17).

²⁰Again, I abstract away from the control/raising distinction in my analysis of the construction, as in the case of transitive 'need' above, cf. (5a).

²¹Recall that a type-shifter is optional to capture examples with the inherent relation; see (13b).

²²I wish to thank Pavel Rudnev for the discussion of this issue with me.

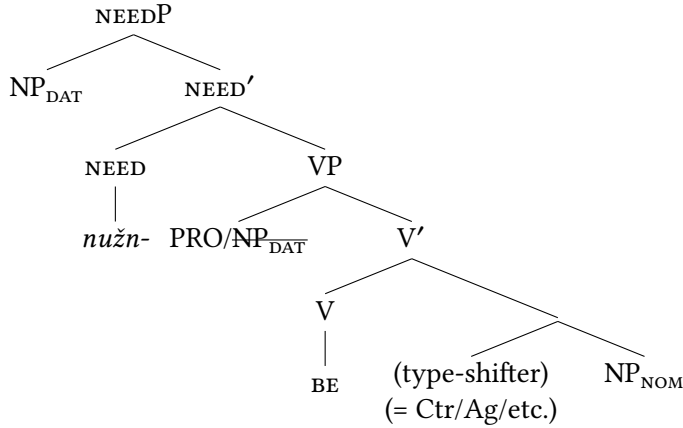


Figure 2: Simplified structure for ‘need’ + NOM

4 The ‘need’ + ACC construction

4.1 Semantic restrictions on ‘need’ + ACC

In contrast to ‘need’ + NOM, the ‘need’ + ACC construction has a more limited semantic variability. As we saw in (17b) above, ‘need’ + ACC can express the control relation; see two naturally-occurring examples from RNC in (22a) and (22b).

- (22) a. *Len-e nado otdel’nuju komnat-u.*
 Lenja-DAT.SG necessary.ADV separate room-ACC.SG
 ‘Lenja needs a separate room.’ (Valentina Oseeva, *Dinka*, 1959)
- b. *Mne nužno lopat-u.*
 me.DAT necessary.ADV spade-ACC.SG
 ‘I need a spade.’ (Vera Panova, *Sereža*, 1955)

However, when it comes to other HAVE-relations, the examples become more dubious. Consider (23a)–(23c), which are meant to illustrate the inherent, part-whole, and typical-use relations.²³ Although as such the examples are not ungrammatical, it is not clear whether they in fact express the relations in question.

²³As with ‘need’ + NOM (see (19d)), the agentive relation is infelicitous; see (i) and footnote 13.

- (i) # *Maš-e nužno tort.* agentive
 Masha-DAT.SG necessary.ADV cake.ACC.SG
 ‘Masha needs (#to bake) a cake.’

Specifically, I wish to argue that in these examples the respective relations are confounded with the control relation and, thus, when the latter is controlled for, the examples become infelicitous.

- (23) a. ? *Ej nužno recenzent-a.* inherent
 her.DAT necessary.ADV reviewer-ACC.SG
 ‘She needs a reviewer (= to be in a reviewer-reviewee relation).’
 b. ? *Emu nužno novyj nos.* part-whole
 him.DAT necessary.ADV new nose.ACC.SG
 ‘He needs a new nose (to be part of him).’
 c. *Ej nužno sigaret-u.* typical-use
 her.DAT necessary.ADV cigarette-ACC.SG
 ‘She needs a cigarette (= to smoke).’

Starting from the inherent relation in (23a), it can be observed that the example allows the construal ‘needs a supervisor *to be at her disposal*’ in a metaphorical sense. When this construal is blocked, as in a situation with an inanimate subject, e.g., where a paper must be assigned a reviewer, the ‘need’ + ACC construction becomes strongly infelicitous, as shown in (24b); cf. ‘need’ + NOM in (24c). This suggests that the inherent relation cannot be expressed in the ‘need’ + ACC construction without simultaneously expressing the control relation.

- (24) a. *Prišla novaja statja.*
 arrived new paper.NOM.SG
 ‘A new paper has arrived.’
 b. # ... *Ej nužno recenzent-a.* ‘need’ + ACC
 her.DAT necessary.ADV reviewer-ACC.SG
 Intended: ‘It (the paper) needs a reviewer.’
 c. ... *Ej nužen recenzent.* ‘need’ + NOM
 her.DAT necessary.M.SG advisor.NOM.SG
 ‘It (the paper) needs a reviewer.’

Similarly, example (23b), meant to illustrate the part-whole relation, can also be metaphorically construed in the control sense, i.e., as ‘needs a new nose *to be at his disposal*’. Again, in a situation with an inanimate subject, e.g., if a statue’s nose has been broken and needs to be replaced, the ‘need’ + ACC construction is infelicitous, as in (25b); see (25c). This suggests that, just like in the previous case, the part-whole relation in the ‘need’ + ACC construction cannot be expressed independently without the control relation.

- (25) a. *Statu-ja slomalas’.*
statue-NOM.SG broke
‘The statue has broken.’
- b. # ... *Ej nužno novyj nos.* ‘need’ + ACC
her.DAT necessary.ADV new nose.ACC.SG
Intended: ‘It (the statue) needs a new nose.’
- c. ... *Ej nužen novyj nos.* ‘need’ + NOM
her.DAT necessary.M.SG new nose.NOM.SG
‘It (the statue) needs a new nose.’

The typical-use relation in (23c) is similarly confounded with the control relation. This can be shown in the following way. Observe that if one needs to smoke a cigarette (or ‘consume’ some other object), one first needs to have it at one’s disposal.²⁴ That is, acts of consumption typically presuppose some sort of control on the part of the subject. However, one can still imagine a situation where someone (say, a baby) is forced to take a medication. In this situation, again, the ‘need’ + ACC construction is infelicitous, as shown in (26b); cf. (26c).

- (26) a. *Rebenok bolen.*
baby.NOM.SG sick
‘The baby is sick.’
- b. # ... *Emu nužno tabletk-u.* ‘need’ + ACC
him.DAT necessary.ADV pill-ACC.SG
Intended: ‘He (the baby) needs (to take) a pill.’
- c. ... *Emu nužn-a tabletk-a.* ‘need’ + NOM
him.DAT necessary-F.SG pill-NOM.SG
‘He (the baby) needs (to take) a pill.’

The infelicity of the examples in (24b)–(26b), with inanimate/non-volitional subjects, can be accounted for if the ‘need’ + ACC construction is restricted to the expression of the control relation, as defined in Vikner & Jensen (2002), which requires an animate being (presumably with some degree of voluntary involvement). By contrast, the other HAVE-relations (i.e., the inherent, part-whole, and typical-use) relations do not require animacy/volition on the part of the subject and, thus, the infelicity of the relevant examples would remain unexplained if ‘need’ + ACC were allowed to express these relations.

²⁴Recall that the typical-use interpretation is restricted to ‘consumable’ objects, according to Zaroukian & Beller (2013); see footnote 12.

The restriction of the ‘need’ + ACC construction to the control relation is further supported by the fact that ‘need’ + ACC is totally incompatible with the expression of the thematic relation, as shown in (27a)/(27b), and the requirement relation, as shown in (28a)/(28b); see the corresponding examples with the ‘need’ + NOM construction in (20a)/(20b) and (21a)/(21b), respectively.²⁵

- (27) a. * *Ej nužno otdyx / son.* thematic
 her.DAT necessary.ADV rest.ACC.SG sleep.ACC.SG
 Intended: ‘She needs rest/sleep.’
 b. * *Ej nužno pomošč’ / hospitalizaci-ju.*
 her.DAT necessary.ADV help.ACC.SG hospitalization-ACC.SG
 Intended: ‘She needs help/hospitalization.’
- (28) a. * *Im nužno ěnergi-ju.* requirement
 them.DAT necessary.ADV energy-ACC.SG
 Intended: ‘They (muscles) need energy.’
 b. * *Im nužno svet.*
 them.DAT necessary.ADV light.ACC.SG
 Intended: ‘They (plants) need light.’

The ungrammaticality of (27a)/(27b) and (28a)/(28b) also follows from the selectional restriction on the control relation, as in the cases discussed above. Specifically, the examples with the thematic relation in (27a)/(27b) are incompatible with the restriction on the internal argument of the control relation to (concrete) physical objects (i.e., something that can be used or handled by the subject, perhaps in a metaphorical sense).²⁶ As for the examples with the requirement relation in (28a)/(28b), they are incompatible with animacy/volitionality restriction on the control relation, as we saw earlier.

²⁵The change to genitive marking in these examples does not lead to any improvement, as shown in (i.a) and (i.b).

- (i) a. * *Ej nužno pomošč-i / otdyx-a.*
 her.DAT necessary.ADV help-GEN.SG rest-GEN.SG
 Intended: ‘She needs help/rest.’
 b. * *Im nužno svet-a.*
 them.DAT necessary.ADV light-GEN.SG
 Intended: ‘They (plants) need light.’

²⁶Vikner & Jensen (2002) treat the notion of a ‘physical object’ in a very broad sense to include not only non-human physical objects such as animals, physical artifacts, and natural objects but also commercialized abstract artifacts like computer programs, etc. I will further assume

To summarize, I have shown that whereas the ‘need’ + NOM construction is compatible with a variety of HAVE-relations, the ‘need’ + ACC construction appears to be compatible only with the control relation. I now turn to an account of this restriction.

4.2 Analysis of ‘need’ + ACC

In order to capture the fact that the ‘need’ + ACC construction necessitates the presence of the control relation, I assume that the predicate *nužno* in this construction lexicalizes Vikner & Jensen’s (2002) control type-shifter (Ctr); see (16). This can be implemented by abstract incorporation (via head movement). In accordance with standard assumptions about head movement, the Ctr head will first incorporate into the immediately c-commanding silent BE, creating a complex head [Ctr + BE], which will, subsequently, incorporate into NEED. The resulting complex [Ctr + BE + NEED] head will be spelled-out as *nužno*. This is schematically represented in Figure 3.

An interesting consequence of the analysis in Figure 3 is that it may be able to derive the ACC marking in the ‘need’ + ACC construction. The basic idea is this: It has been independently proposed that ‘have’ involves (abstract) incorporation of (locative) P into verbal ‘be’, to account for the functional similarity of possessive constructions with ‘have’ and ‘be’ across languages (see Freeze 1992; Kayne 1993). Although, in the discussion above, I have abstracted away from the syntactic category of Ctr (and the other type-shifters producing relational denotations for NPs), it may be observed that Ctr is similar to a preposition. For example, it is also relational, it takes a noun phrase as its argument, and it is selected by a verbal head. Thus, we may tentatively assume that Ctr is a P head. Now, under the Freeze/Kayne analysis, the incorporation of Ctr/P into BE will lead to the creation of HAVE, thus accounting for the observed transitivity/ACC marking in the construction.

The analysis presented in Figure 3 appears to contradict Harves & Kayne’s (2012) analysis of Russian within the context of their proposed cross-linguistic generalization, according to which transitive ‘need’ is only found in languages

‘physical objects’ to also potentially include humans (in a metaphorical sense) when the latter are construed as means to an end. This will account for examples like (i).

(i) *Mne nado Kol-ju!*
 me.DAT need.ADV Kolja-ACC.SG
 ‘I need Kolja (to be at my disposal).’

(Valentin Kataev, *Almaznyj moj venec*, 1979)

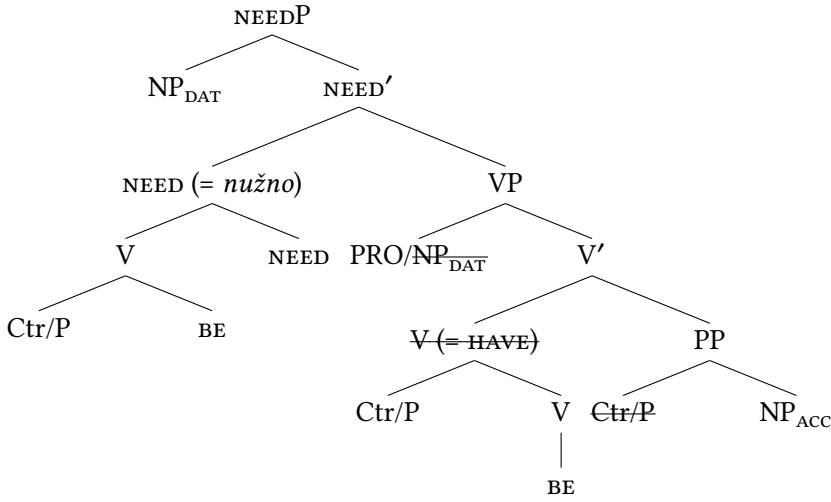


Figure 3: Simplified structure for ‘need’ + ACC

with transitive ‘have’. As I alluded to above (see §2.1), they assume that Russian conforms to this generalization as it lacks both (basic) transitive ‘have’ and transitive ‘need’. If the analysis in Figure 3 is correct, it leads to the opposite conclusion, namely that Russian has both (at some level of abstraction). Curiously, this does not falsify Harves & Kayne’s cross-linguistic generalization but, on the contrary, confirms it. That is, Russian has transitive/ACC-assigning ‘need’ precisely because it has a particular structure underlying ‘have’, i.e., [P + BE].²⁷ Both structures, however, appear only in rather marginal constructions and thus were probably overlooked by Harves & Kayne (2012).

Before concluding this section, I wish to discuss some independent evidence for the existence of the [Ctr/P + BE] structure in Russian, which is underlyingly identical to ‘have’. Specifically, Russian has a so-called verbless subjunctive construction with nouns (see Dobrushina 2015). The construction involves a dative subject, the subjunctive particle *by*, and an ACC (or GEN) argument. An interesting and unexplained property of this construction noted by Dobrushina (2015) is that it disallows a NOM-NP; see (29). In Knyazev (2020), I argue that the construction roughly expresses a possessive meaning as indicated by the translation in

²⁷The analysis in Figure 3 is consistent with the correlation between transitive ‘need’ and ‘have’ proposed by Harves & Kayne (2012) but crucially differs from their causal account of this correlation, according to which transitive ‘need’ is derived from incorporation of nominal (non-verbal) ‘need’ into ‘have’ rather than the other way around (see their footnote 11). A detailed comparison between the two accounts is left for future work.

(29).²⁸

- (29) *Mne by knig-u / *knig-a.*
 me.DAT SBJV book-ACC.SG book-NOM.SG
 ‘I wish I had a book.’

Although the matter requires further investigation, there is some evidence that the construction actually has the control interpretation, as suggested by the fact that it is disallowed with deverbal nominals, as shown in (30a) and (30b). Assuming that the construction involves Ctr and silent BE and is derived by Ctr-to-BE movement, as proposed for the ‘need’ + ACC construction (without, however, a further step as there is no NEED for [Ctr/P + BE] to incorporate into), we could account for the otherwise mysterious ACC marking in this construction.

- (30) a. * *Mne by gospitalizaci-ju / gospitalizaci-ja.*
 me.DAT SBJV hospitalization-ACC.SG hospitalization-NOM.SG
 Intended: ‘I wish I were hospitalized.’
 b. * *Emu by čistk-u / čistk-a.*
 him.DAT SBJV cleaning-ACC.SG cleaning-NOM.SG
 Intended: ‘I wish I had it (the carpet) cleaned.’

In the rest of this paper, I will discuss three formal acceptability judgment studies which tested the hypothesis that the ‘need’ + ACC construction lexicalizes the control relation, as understood by Vikner & Jensen (2002). Because this relation cannot be directly observed, the experiments tested the selectional restrictions on this relation, namely the animacy restriction on the dative subject and the restriction on the ACC theme to (concrete) physical objects, i.e., the concreteness restriction.

5 Experimental studies

5.1 Experiment 1a

5.1.1 Design and hypotheses

The purpose of Experiment 1a was to test the animacy restriction on the dative subject in the ‘need’ + ACC construction with *nužen/nužno*. The experiment had

²⁸ Dobrushina (2015) analyzes this construction as a result of ellipsis of an infinitive, but in Knyazev (2020) I show that the ellipsis analysis makes wrong predictions and argue for a possessive analysis.

a 2×2 factorial design, crossing CONSTRUCTION TYPE (ACC | NOM) and ANIMACY (ANIMATE | INANIMATE), as shown in (31).

- (31) a. *Klient-u nužen akkumuljator.* NOM | ANIMATE
 client-DAT.SG necessary.M.SG battery.NOM.SG
 ‘The client needs a battery’.
- b. *Klient-u nužno akkumuljator.* ACC | ANIMATE
 client-DAT.SG necessary.ADV battery.ACC.SG
 ‘The client needs a battery’.
- c. *Noutbuk-u nužen akkumuljator.* NOM | INANIMATE
 laptop-DAT.SG necessary.M.SG battery.NOM.SG
 ‘The laptop needs a battery’.
- d. * *Noutbuk-u nužno akkumuljator.* ACC | INANIMATE
 laptop-DAT.SG necessary.ADV battery.ACC.SG
 Intended: ‘The laptop needs a battery’.

Given that the ‘need’ + ACC construction is highly colloquial, it was expected that the ACC condition will generally be less acceptable than the NOM condition. It was also expected that the INANIMATE condition will be generally less acceptable than the ANIMATE condition, as such examples are considerably less frequent. Crucially, it was also expected that the decrease in acceptability in the ACC | INANIMATE condition (as compared to the baseline NOM | ANIMATE condition) will be above and beyond the combined effects of both INANIMATE and ACC conditions. In other words, a SUPERADDITIVE INTERACTION was expected (see [Sprouse et al. 2012](#) for details).

5.1.2 Materials and procedure

Eight lexically matched sentence sets of four sentences as in (31) were created. All sentences had the dative subject realized as an animate or inanimate common noun with no prenominal or postnominal material (the animate and inanimate nouns within a sentence set were not matched by any criteria). Thirty-two experimental sentences were distributed over four protocols using a Latin Square design. They were interspersed (in a pseudorandom order) with eight filler sentences half of which were fully grammatical while the other half were fully ungrammatical (four sentences contained the ‘need’ + NOM construction with agreement violations; four sentences contained *nužen/nužno* followed by an infinitival or a subjunctive clause). Participants had to rate how natural each sentence

sounded on a 7-point scale. As usual, participants were instructed to consult their own intuition, disregard any prescriptive knowledge, and focus on whether any sentences sounded “foreign” to them. The experiment was conducted in Google Forms and was completed by 123 participants.

5.1.3 Results

Prior to the analysis, the ratings were z-score transformed (see Schütze & Sprouse 2014). The mean rating for the ungrammatical fillers was -0.98 ($SD = 0.35$); the mean rating for the grammatical fillers was 0.9 ($SD = 0.42$). The raw ratings were 1.21 (0.11) and 6.43 (0.17), respectively. The condition means are shown in Table 1 and in Figure ??.

Table 1: z-score means (SD) in Experiment 1a

	‘need’ + NOM	‘need’ + ACC
animate	0.94 (0.44)	-0.76 (0.44)
inanimate	0.63 (0.60)	-0.82 (0.48)
animate (raw)	6.44 (1.29)	1.98 (1.55)
inanimate (raw)	5.70 (1.81)	1.80 (1.51)

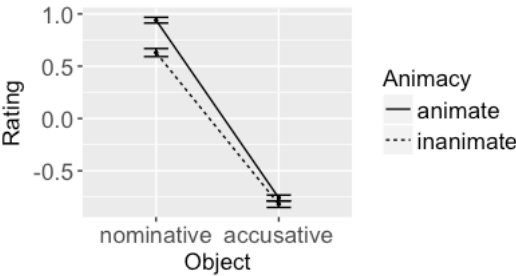


Figure 4: Interaction plot for Experiment 1a

For the statistical analysis, a mixed-effects linear model was constructed using the `lmer` function from the R statistical language package `lmerTest`. The model included the factors CONSTRUCTION TYPE and ANIMACY as well as their interaction as fixed effects and had a maximal random effects structure (including random intercepts for subject and item as well as by-item and by-subject

random slopes, and correlations for all fixed effects and their interaction), as recommended by [Barr et al. \(2013\)](#). *p*-values were obtained using the Satterthwaite approximation, available from the same package.²⁹

As expected, there was a highly significant main effect of CONSTRUCTION TYPE, showing that sentences with ACC themes are rated lower than sentences with NOM themes (Estimate = -1.70 , SE = 0.04 , $t = -29.1$, $p < 0.001$). There was also a main effect of ANIMACY, showing that sentences with inanimate subjects are rated lower than sentences with animate subjects (Estimate = -0.31 , SE = 0.12 , $t = -2.59$, $p = 0.03$), although this effect was less significant. However, the interaction was not significant (Estimate = 0.24 , SE = 0.12 , $t = 2.02$, $p = 0.08$). Interestingly, the (trend towards an) interaction was not in the predicted direction as inanimacy turned out to decrease rather than increase the lowering effect of the construction with ACC. This pattern has been noted before in the experimental syntax literature and has come to be identified as a SUBADDITIVE effect (see, e.g., [Stepanov et al. 2018](#)).

5.1.4 Discussion

As it stands, the results of the experiment do not support the hypothesized animacy restriction in the ‘need’ + ACC construction, calling for an explanation. Note first that a floor effect is unlikely, as the ungrammatical fillers received a (z-score) rating of -0.98 , which is 0.23 points lower than the ACC | INANIMATE condition (-0.75). However, there might be an alternative source of the negative results.

Given a very large effect of the CONSTRUCTION TYPE (the lowering effect of -1.7 points in the animate condition), it is likely that the participants judged the ‘need’ + ACC construction as simply ungrammatical; see the raw rating of 1.8 – 1.98 for the two ACC conditions. It has been suggested in the processing literature (see [Hofmeister et al. 2014](#)) that when one grammatical violation combines with another grammatical violation or a processing effect, the result may be subadditive (underadditive) rather than additive or superadditive, whereby the second grammatical violation or a processing difficulty does not lead to a further decrease in unacceptability in the ungrammatical condition. I tentatively suggest that this is what might have happened in this experiment.

Specifically, given the perceived strong ungrammaticality of the ‘need’ + ACC construction, I suggest that an additional violation of the animacy restriction caused no further decrease in acceptability and thus failed to be detected. Similarly, the processing effect of animacy, which we observe in the ‘grammatical’

²⁹The statistical procedures followed [Keshev & Meltzer-Asscher \(2019\)](#).

NOM condition, did not show up in the ‘ungrammatical’ ACC condition, presumably leading to a trend towards a sub-additive interaction.

5.2 Experiment 1b

5.2.1 Design and materials

Experiment 1b had the same purpose as Experiment 1a but a slightly different design with materials constructed in such a way as to increase the overall ratings of the ‘need’ + ACC construction (and potentially reduce its perceived ungrammaticality). A prior corpus study established that the ‘need’ + ACC construction has a higher absolute frequency with *nado* than with *nužno*.³⁰ Accordingly, it was decided to use *nado* in the ACC condition. Furthermore, it was observed that dative subjects realized as full NPs are very rare in the construction, compared to pronominal NPs. Accordingly, 3rd person pronouns (both singular and plural) were used as dative subjects. Although they are not as frequent as the 1st person singular pronoun (which is the most frequent one), this allowed to have more variety in the materials. In order to fix the reference of the pronominal subject, the experimental sentences were preceded by a supporting context consisting of a short sentence with one prominent referent, either animate or inanimate. The materials for the experiment are illustrated in (32) and (33).

(32) Context: *U Kati slomalsja noutbuk.*

at Katja broke laptop

‘Katja’s laptop broke down.’

a. *Ej nužen adapter.*

NOM | ANIMATE

her.DAT necessary.M.SG adapter.NOM.SG

‘She needs an adapter.’

b. *Ej nado adapter.*

ACC | ANIMATE

her.DAT necessary.ADV adapter.ACC.SG

‘She needs an adapter.’

(33) Context: *Étot noutbuk slomalsja.*

this laptop broke

‘This laptop broke down.’

³⁰We cannot compare relative frequencies as *nado* is disallowed in the ‘need’ + NOM construction.

- a. *Emu nužen adapter.* NOM | INANIMATE
 him.DAT necessary.M.SG adapter.NOM.SG
 ‘It (the laptop) needs an adapter.’
- b. * *Emu nado adapter.* ACC | INANIMATE
 him.DAT need.ADV adapter.ACC.SG
 Intended: ‘It (the laptop) needs an adapter.’

Eight sentence sets of four sentences as in (32) and (33) were constructed. The experimental sentences were distributed over four protocols using a Latin Square design and interspersed with 12 filler sentences, which were similar to those used in Experiment 1a except that half of the sentences were with *nado* and there were four sentences of intermediate acceptability that contained inanimate dative subjects with *nado/nužno* followed by infinitival/subjunctive clauses (to contrast the hypothesized animacy restriction with different types of sentences with ‘need’). The experiment was printed and distributed to philology students at a local university. The task and instructions were as in Experiment 1a. Seventy-one students participated in the experiment.

5.2.2 Results

The data from two students were discarded due to missing values. The analysis of the data used z-score transformed ratings, as in Experiment 1a. The mean rating for the ungrammatical fillers was -0.96 ($SD = 0.56$); the mean rating for the grammatical fillers was 0.97 ($SD = 0.46$); the mean rating for the intermediate fillers was 0.08 ($SD = 0.79$). The raw ratings were 1.66 (1.48), 6.40 (1.17) and 3.85 (2.07), respectively. The condition means are given in Table 2 and in Figure ??.

Table 2: z-score means (SD) in Experiment 1b

	‘need’ + NOM	‘need’ + ACC
animate	1.01 (0.50)	−0.46 (0.64)
inanimate	0.38 (0.77)	−0.80 (0.46)
animate (raw)	6.46 (1.23)	2.86 (1.83)
inanimate (raw)	5.01 (1.98)	2.09 (1.28)

There was a main effect of construction type (Estimate = -1.46 , $SE = 0.15$, $t = -9.23$, $p < 0.001$), showing that sentences with ACC themes are rated lower than sentences with NOM themes and a main effect of ANIMACY, showing that

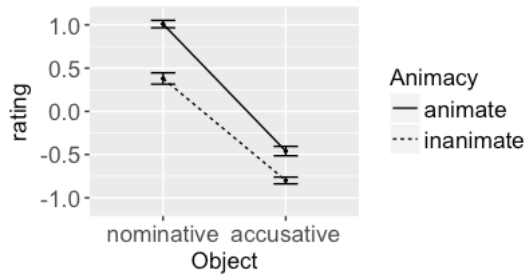


Figure 5: Interaction plot for Experiment 1b

sentences with inanimate subjects are rated lower than sentences with animate subjects (Estimate = -0.62 , $SE = 0.15$, $t = -4.09$, $p = 0.003$). The effect of animacy was more significant and more reliable than in Experiment 1a. The interaction, however, was not statistically significant and numerically in the opposite direction, as in Experiment 1a (Estimate = 0.29 , $SE = 0.17$, $t = 1.74$, $p = 0.12$).

5.2.3 Discussion

The results of Experiment 1b were similar to those of Experiment 1a. Modifications in the design, however, did bring some change in the pattern of the results. The mean rating for the ACC | ANIMATE condition, which can be used to assess whether speakers perceived the ‘need’ + ACC construction as grammatical (in the absence of hypothesized selectional violations), was higher (-0.46) than in Experiment 1a (-0.69); compare 2.86 with 1.8 in raw ratings, and somewhat closer to intermediate acceptability. This suggests that in absolute terms participants did not perceive the ‘need’ + ACC construction as totally ungrammatical; compare -0.96 for the ungrammatical fillers with 1.66 in raw ratings.

In relative terms, however, the decrease associated with the ACC (in the ANIMATE condition) was still very strong (-1.46 , as compared to -1.62 in Experiment 1a). Therefore, it is likely that participants still perceived the ‘need’ + ACC construction as ungrammatical, which, again, may have led to a failure to detect the animacy restriction, as in Experiment 1a. Thus, the negative results of Experiment 1b are also consistent with the assumption that combined violations involving grammatical violations do not necessarily add up to decrease the overall acceptability of the sentence. Overall, the main difference between Experiments 1a and 1b was that the participants in the second experiment were more sensitive to the animacy manipulation in the NOM condition, which gave rise to a more pronounced animacy effect.

5.3 Experiment 2

5.3.1 Design and hypotheses

The purpose of Experiment 2 was to test the concreteness restriction on the ACC argument in the ‘need’ + ACC construction with *nužen/nužno*. The experiment had a 2×2 factorial design, crossing the CONSTRUCTION TYPE and CONCRETENESS (CONCRETE | ABSTRACT), as illustrated in (34) and (35). The hypothesis was that both ACC marking and abstractness will lower acceptability. As in Experiments 1a and 1b, it was also expected that the lowering effect of ACC will be stronger in the abstract condition, leading to a superadditive interaction.

(34) *Context: U Kati peregorel svet.*

at Katja burn.out light

‘The lights burned out at Katja’s place.’

a. *Ej nužn-a lampočk-a.* NOM | CONCRETE
her.DAT necessary-F.SG lightbulb-NOM.SG

‘She needs a lightbulb.’

b. *Ej nužno lampočk-u.* ACC | CONCRETE
her.DAT necessary.ADV lightbulb-ACC.SG

‘She needs a lightbulb.’

(35) *Context: Katja ne mozet sama rešit’ etu problemu.*

Katja not can self solve this problem

‘Katja can’t solve this problem alone.’

a. *Ej nužn-a konsul’taci-ja.* NOM | ABSTRACT
her.DAT necessary-F.SG advice-NOM.SG

‘She needs advice.’

b. **Ej nužno konsul’taci-ju.* ACC | ABSTRACT
her.DAT necessary.ADV advice-ACC.SG

Intended: ‘She needs advice.’

5.3.2 Materials and procedure

The construction of materials was as in Experiment 1b except that the modal predicate did not vary within the sentence sets. As before, there were eight sentence sets of four conditions as in (34) and (35). The abstract/concrete nouns within a sentence set were matched in gender, length, and frequency (according to Ljaševskaja & Šarov 2009). The experimental sentences were interspersed

with eight fillers similar to those in Experiment 1a. The task was as in the two previous experiments except that a 5-point rating scale was used. The experiment was conducted in Google Forms and was completed by 54 participants.

5.3.3 Results

The analysis followed the same procedure as in the previous experiments. The mean rating for the ungrammatical fillers was -1.07 ($SD = 0.42$); the mean rating for the grammatical fillers was 0.81 ($SD = 0.43$). The raw ratings were 1.19 (0.68) and 4.57 (0.84), respectively. The condition means are given in Table 3 and in Figure ??.

Table 3: z-score means (SD) in Experiment 2

	‘need’ + NOM	‘need’ + ACC
concrete	0.89 (0.45)	−0.43 (0.55)
abstract	0.79 (0.54)	−0.71 (0.51)
concrete (raw)	4.72 (0.84)	2.31 (1.23)
abstract (raw)	4.53 (1.04)	1.81 (1.09)

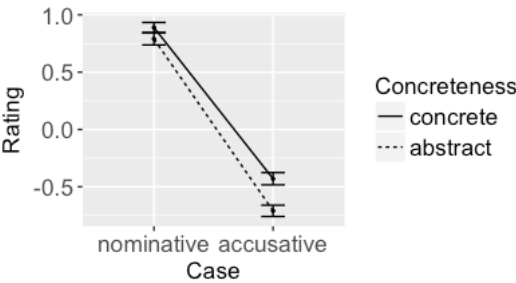


Figure 6: Interaction plot of z-score ratings (SE) for Experiment 2

There was a main effect of construction type (Estimate = -1.32 , $SE = 0.11$, $t = -12.5$, $p < 0.001$), showing that sentences with ACC themes were rated lower than sentences with NOM themes, as in the previous experiments. Neither the main effect of concreteness (Estimate = -0.07 , $SE = 0.13$, $t = 0.59$, $p = 0.58$) nor the interaction between concreteness and construction type (Estimate = -0.23 , $SE = 0.16$, $t = -1.44$, $p = 0.19$) were statistically significant. Although the interaction was not significant, we see a trend in the predicted direction, in contrast

to Experiments 1a and 1b. Moreover, the size of the interaction (-0.23) is close in magnitude to the lower boundary for weak islands effects as reported by Kush et al. (2018).

5.3.4 Discussion

As in the case with the animacy restriction in Experiments 1a and 1b, the results of Experiment 2 failed to provide support for the hypothesized concreteness restriction. However, given a very strong lowering effect of ACC (-1.32 ; compare -1.62 with -1.46 in the previous experiments), it may again be hypothesized that the participants perceived the ‘need’ + ACC construction as ungrammatical. Given the explanation suggested for Experiments 1a and 1b above, according to which grammatical violations need not combine additively, this may have led to the lack of a statistically significant interaction in the results and thus a failure to detect the concreteness restriction. Interestingly, in contrast to Experiments 1a and 1b, there was no independent effect of concreteness, suggesting that abstractness of the ACC theme did not incur any extra processing costs (in the NOM condition). This might have led to the absence of a subadditive pattern which was observed in Experiments 1a and 1b.

5.4 General discussion

Unfortunately, the three experimental studies reported above failed to confirm the animacy and concreteness restrictions in the ‘need’ + ACC construction (as operationalized by the presence of superadditive interactions) and thus do not provide (indirect) evidence for the analysis of this construction as involving the control relation (syntactically represented as the Ctr head), which was proposed in §4.2.

However, this does not necessarily imply that the proposed account of the ‘need’ + ACC construction is wrong. As I suggested above, the failure to obtain superadditive interactions in the experiments could be due to the perceived ungrammaticality of the ‘need’ + ACC construction. This may have nullified the lowering effect of the selectional violations associated with the control relation (i.e., the animacy and concreteness restrictions), in accordance with the hypothesis that grammatical violations may not combine additively, as argued in Hofmeister et al. (2014).

This interpretation, of course, requires investigation. Further studies will have to find ways to eliminate the supposed ungrammaticality effect. One obvious

possibility is to try to use oral materials to bias participants away from the written/standard variant.³¹ Another option is to alter the judgment task, in view of the possibility that subjects might find it difficult to discriminate between different types of ungrammatical sentences on a scale. For example, one might try using relative judgments with the Thurstone model (see Langsford et al. 2018) or a joint presentation of conditions, as suggested by Marty et al. (2020).

All in all, the basic prediction of the proposed account is that a superadditive interaction will become visible once the participants are able to judge the ‘need’ + ACC construction as acceptable.

6 Conclusion

In this paper, I have discussed two ‘need’ + NP constructions in Russian, namely, the more basic ‘need’ + NOM construction and the more marginal, highly colloquial ‘need’ + ACC construction. The main focus was on the contrast in the semantic variability between these two constructions (i.e., the range of relations that they can express), as discussed by Zaroukian & Beller (2013) with reference to English transitive ‘need’ and related constructions.

Specifically, I showed that the ‘need’ + NOM construction in Russian can express a variety of relations, including the (arguably most prototypical) control relation, but also the inherent, part-whole, and typical-use relations, on a par with English transitive ‘need’. I also identified two new relations which have not been discussed before in this connection, namely the thematic relation (expressed in constructions with deverbal nominals) and the requirement relation, which are compatible with both ‘need’ + NOM and English transitive ‘need’. I also showed that, crucially, in contrast to the ‘need’ + NOM construction (and transitive ‘need’), the ‘need’ + ACC construction is restricted to the expression of the control relation. This is suggested by the presence of the concreteness and animacy restrictions (which are lexically associated with the control relation) in this construction.

I proposed an analysis of the two ‘need’ + NP constructions in Russian whereby they both take a concealed clausal complement involving silent HAVE, as was proposed in the previous literature on intensional transitive verbs (e.g., Harves 2008). However, in contrast to the previous literature, I used a more elaborate analysis of the semantic variability associated with HAVE. Specifically, I followed Zaroukian & Beller (2013), where diverse HAVE-relations are modeled as various (syntactically represented) type-shifters, which provide relational denotations

³¹This was suggested to me by Diogo Almeida (p.c.).

for the object NP, whereas HAVE is treated as an abstract linker between the subject NP and the NP-relation.

In order to capture the contrast in the semantic variability between the ‘need’ + NOM construction and the ‘need’ + ACC construction, I argued that the latter but not the former incorporates (via head movement) the type-shifter associated with the control relation (i.e., Ctr). I also tentatively suggested that this might explain the ACC marking in the ‘need’ + ACC construction along the lines of the P-incorporation account of ‘have’ in [Freeze \(1992\)](#) (see also [Kayne 1993](#)).

Finally, I discussed three acceptability judgment studies, which used a factorial design to test the animacy and the concreteness restriction in the ‘need’ + ACC construction, which are associated with the control relation. Intriguingly, these studies failed to provide support for these restrictions (experimentally operationalized as a superadditive interaction). I speculated that the negative results might be due to the perceived ungrammaticality of the ‘need’ + ACC construction and the hypothesis that combined grammaticality violations may not add up to decrease the overall acceptability (see [Hofmeister et al. 2014](#) for further discussion). This suggestion must, of course, be tested in future work.

Abbreviations

RNC	Russian National Corpus	GEN	genitive
1	first person	M	masculine
3	third person	N	neuter
ADV	adverbial	NOM	nominative
ACC	accusative	PL	plural
DAT	dative	SG	singular
F	feminine	SBJV	subjunctive

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Appendix: Experimental materials

(36) Items for Experiment 1a

8 *Silent HAVE needs revisiting: (Non-)possessive meanings with transitive
intensional 'need' in Russian*

- a. Voditeljam (avtomobiljam) nužen (nužno) benzin.
- b. Voennym (samoletam) nužen (nužno) aërodrom.
- c. Stroiteljam (betonu) nužna voda (nužno vodu).
- d. Juveliru (kamnju) nužna oprava (nužno opravu).
- e. Škol'niku (smartfonu) nužen (nužno) modnyj čexol.
- f. Žil'cam (komnate) nužny (nužno) svetlye oboi.
- g. Klientu (noutbuku) nužen (nužno) akkumuljator.
- h. Znakomym (knigam) nužen (nužno) stellaž.

(37) Items for Experiment 1b

- a. Ej (= Maše) / emu (= telefonu) nužen (nado) čexol.
- b. Ej (= Kate) / emu (= noutbuku) nužen (nado) adapter.
- c. Im (= sosedjam) / ej (= komnate) nužna ljustra (nado ljustru).
- d. Im (= sotrudnikam) / im (= oknam) nužny / nado žaljuzi.
- e. Nam / emu (= avtomobilju) nužen (nado) voditelja.
- f. Im (= organizatoram) / ej (= olimpiade) nužny volonter / nado volonterov.
- g. Ej (= Svete) / im (= glazam) nužen (nado) otdyx.
- h. Nam / emu (= kišečniku) nužna podderžka (nado podderžki).

(38) Items for Experiment 2

- a. Ej nužna kletka (podderžka) / nužno kletku (podderžku).
- b. Emu nužen / nužno orden (otpusk).
- c. Ej nužna figurka (uborka) / nužno figurku (uborku).
- d. Emu nužen / nužno kostjum (povod).
- e. Ej nužna lampočka (konsul'tacija) / nužno lampočku (konsul'taciju).
- f. Ej nužna svekla (otsročka) / nužno sveklu (otsročku).
- g. Ej nužna pižama (razrjadka) / nužno pižamu (razrjadku).
- h. Ej nužna ručka (družba) / nužno ručku (družbu).

Chapter 9

Reference to kinds and subkinds in Polish

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This paper investigates the syntax and semantics of direct kind reference in Polish. Taking [Borik & Espinal 2012; 2015](#) as our point of departure, we argue that kind-referring nominals in Polish have the same properties as their counterparts in English, Spanish, and Russian. Specifically, they are definite and numberless. Even though Polish does not realize definiteness overtly, we present evidence from pronominal co-reference and object topicalization to show that Polish kind nominals are definite. We then point to a previously unaddressed contradiction regarding modified kinds. [Borik & Espinal](#)'s assumption that bare nouns denote singleton sets of kinds is incompatible with the intersective approach to kind modification ([McNally & Boleda 2004; Wągiel 2014](#)). To circumvent this issue, we introduce a subkind operator *sk* into the semantics, linking it to the projection of a subkind phrase in the syntax. This allows us to account for some novel data involving kind modifiers (e.g. *Bengal*) and kind classifiers (e.g. *kind of*). Tentatively, we suggest that the subkind head is a type of a more general classifier head ([Borer 2005; Picallo 2006; Kratzer 2007](#)).

Keywords: genericity, kind reference, kind modification, subkinds, nominals, number, definiteness, Polish

1 Introduction

Ever since [Carlson's \(1977\)](#) seminal dissertation, semantic ontology has been assumed to contain at least two sorts of individuals: objects (spatiotemporal instantiations of individuals) and kinds (abstract types of individuals). Unsurprisingly, we call kind-referring a nominal which refers to a kind-level individual



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(see Krifka 1995). A typical example is the English definite *the dodo* in (1). Since the property *be extinct* cannot be predicated of concrete individuals, the subject DP must refer to the kind ‘dodo’ directly.

- (1) The dodo is extinct.

Though most studies of kind reference focus on English, some researchers have investigated this phenomenon from a cross-linguistic perspective, seeking to establish generalizations about the structure of kind-referring nominals across languages (see especially Chierchia 1998 and Dayal 2004). More recently, Borik & Espinal have developed a syntactic and semantic account of kind reference which falls squarely within this tradition. In a series of papers, Borik & Espinal 2012; 2015; 2020; 2018 draw on evidence from English, Russian, and Spanish to argue that kind-referring DPs are definite and numberless (i.e. lacking the projection of number).

In the first half of this paper, we investigate whether Borik & Espinal’s hypothesis holds for Polish. We hypothesize that kind nominals in Polish have the same structure as their counterparts in Romance and Germanic languages, which means that they are both definite and numberless. §2 discusses the role of definiteness in deriving reference to kinds. Unlike English and Spanish, Polish does not realize definiteness overtly, which makes it difficult to diagnose the presence of definiteness in kind-referring DPs. Taking on this challenge, we present new evidence from object topicalization which supports the hypothesis that Polish kind nominals are definite.

§3 addresses the role of number in licensing kind, subkind, and object readings. The presence of number is shown to block direct reference to kinds, admitting only reference to subkinds or objects instead. From this, we conclude that Polish kind-referring DPs are numberless, thus extending the empirical coverage of Borik & Espinal’s theory to a new language.

The second half of the paper turns to the derivation of modified kinds (e.g. *the Bengal tiger*). We start §4 by pointing out a contradiction between Borik & Espinal’s theory of DEFINITE NUMBERLESS KINDS and the intersective approach to KIND MODIFICATION advocated by McNally & Boleda (2004), Wagiel (2014), and Borik & Espinal (2015). While Borik & Espinal presuppose that NP denotations are atomic (i.e. $\llbracket \text{tiger} \rrbracket$ is a singleton set of kinds), McNally & Boleda (2004) assume taxonomic NP denotations (i.e. $\llbracket \text{tiger} \rrbracket$ includes the kind ‘tiger’ and all of its subkinds). We suggest a way of integrating the two approaches by introducing a subkind operator *SK* into the semantics and linking it to the projection of a SUBKIND PHRASE in the syntax. This allows us to maintain that NPs have

atomic rather than taxonomic denotations, while still deriving the correct interpretations for modified kinds.

Finally, §5 summarizes our main findings concerning reference to kinds and subkinds in Polish, and make explicit the denotations and structures for the proposed operators and DP projections.

2 Reference to kinds is definite

The goal of this section is to lay out our assumptions about the relation between DEFINITENESS and the availability of direct reference to kinds. To begin with, §2.1 provides a brief overview of the syntax and semantics of kind-referring DPs in Romance and Germanic languages, which have an overt definite article in their inventory of functional morphemes. It will be suggested that definiteness, understood as the uniqueness-presupposing *ι* operator in the sense of Partee (1987), is a necessary component of kind reference in those languages.

In §2.2, we extend the analysis to Polish, a language without a morphological exponent of definiteness. After discussing our theoretical assumptions concerning the syntax-semantics interface, particularly our rejection of semantic type-shifting and the universal character of the DP ↔ individual mapping, we present new evidence from object topicalization to show that Polish kind-referring DPs are definite.

2.1 The semantics of definiteness

Let us start with a few examples of kind-referring DPs taken from English (2a), German (2b), Spanish (2c), and French (2d). The first thing we observe is that a morphologically singular count noun requires the definite article to achieve kind reference. The variants without the article are all ungrammatical.¹

- | | | | |
|-----|----|---------------------------------------|-----------|
| (2) | a. | * <i>(The) dodo is extinct.</i> | (English) |
| | b. | * <i>(Der) Dodo ist ausgestorben.</i> | (German) |
| | | the dodo is out.died | |
| | c. | * <i>(El) dodo está extinto.</i> | (Spanish) |
| | | the dodo is extinct | |

¹Note that this generalization does not extend to mass kinds. Kind-referring DPs derived from mass nouns exhibit mixed behaviour with respect to the obligatoriness of the definite article: they require the definite article in French, reject it in English, and take one optionally in German. We do not discuss mass kinds in this paper, leaving them for future research.

- d. **(Le) dodo est éteint.* (French)
the dodo is extinct

This leads us to ask about the function of the definite article in (2). According to Krifka (1995), the presence of the article is necessary for syntactic well-formedness, but it has no effect on the semantic computation (3). In his view, bare count NPs refer to kinds directly, whereas the article is merely “ornamental”, inserted to satisfy structural constraints that are orthogonal to the semantics. This entails that the definite article is two-way ambiguous, denoting the identity function on the kind reading and the ι operator on the object reading.

- (3) a. $\llbracket \text{dodo} \rrbracket = \text{DODO}$
b. $\llbracket \text{the} \rrbracket = \lambda x.x$
c. $\llbracket \text{the dodo} \rrbracket = \text{DODO}$

Dayal (2004) takes a different approach, arguing that the denotation of the definite article is constant across kind-referring and object-referring contexts. Specifically, the definite article always translates as the ι operator, which maps a predicate P onto the unique element satisfying that predicate (see Partee 1987). Furthermore, Dayal (2004) assumes that NP denotations are ambiguous between properties of kinds and properties of objects. In (4a), the type variable t ranges over the values k (for ‘kind’) and o (for ‘object’), depending on the context of its occurrence. Reference to kinds emerges when the NP is contextually “calibrated” to denote a property of kinds, with the kind ‘dodo’ selected by the uniqueness-presupposing ι operator, as illustrated in (4c) below.

- (4) a. $\llbracket \text{dodo} \rrbracket = \lambda x^t.\text{DODO}(x^t)$
b. $\llbracket \text{the} \rrbracket = \lambda P.\iota x[P(x)]$
c. $\llbracket \text{the dodo} \rrbracket = \iota x^k[\text{DODO}(x^k)]$

To recapitulate, Dayal (2004) dispenses with Krifka’s (1995) assumption that the definite article is ambiguous, but admits a two-way ambiguity between object- and kind-level denotations for bare NPs.

In many respects, the proposal of Borik & Espinal (2012; 2015) can be seen as another step towards ambiguity reduction in the semantics, and a closer correspondence between syntactic structure and semantic interpretation. For Borik & Espinal, just like for Dayal (2004), the definite article in Romance and Germanic kinds translates as the ι operator. Their main innovation is the hypothesis that bare NPs unambiguously denote properties of kinds, while object denotations

are derived via the Carlsonian realization relation \mathbb{R} in the presence of number (see Carlson 1977). We defer the discussion of the relation between number and kind reference until §3. For now, the important point is that the only difference between Borik & Espinal’s and Dayal’s (2004) approach to the derivation of definite kinds concerns the representation of bare NPs: while Dayal (2004) assumes that they are ambiguous (4a), Borik & Espinal postulate that they are properties of kinds (5a).

- (5) a. $\llbracket \text{dodo} \rrbracket = \lambda x^k. \text{DODO}(x^k)$
 b. $\llbracket \text{the} \rrbracket = \lambda P. \iota x [P(x)]$
 c. $\llbracket \text{the dodo} \rrbracket = \iota x^k [\text{DODO}(x^k)]$

Given the crucial role played by definiteness in converting properties of kinds to kind individuals in (4) and (5), Slavic languages constitute an important litmus test for the theories of kind reference outlined above. Since Polish lacks a determiner system, the presence of the definite feature carried on the syntactic D head does not have an observable morphological exponent. And yet, the existence of the DP projection in Slavic has been defended by Pereltsvaig 2007 for Russian and by Willim 2000, Migdalski 2001 and Rutkowski 2007 for Polish, based on evidence from demonstrative pronouns and prenominal possessives, among others. In the next section, we build on the results of this work to argue that Polish kind-referring nominals are definite DPs.²

2.2 Definite kinds in Polish

We have considered English, German, Spanish, and French DPs, all of which require the presence of a definite determiner in kind-referring contexts. In this section, we turn to parallel examples in Polish, building on the discussion of Russian in Borik & Espinal (2012; 2020). By arguing for covert definiteness in Polish kind-referring DPs, we extend the empirical coverage of Dayal’s (2004) and Borik & Espinal’s theories to another language. We also discuss new evidence from object topicalization, which strengthens the case for definiteness in Polish kind-referring DPs.

²We acknowledge that there is a more nuanced, ongoing debate about the status of the DP in Slavic languages. There are some arguments against a DP and in favor of an NP-analysis. Most prominently, Bošković (2005) and Bošković (2007) focus on the mutual exclusivity of adjectival left-branch extraction and the presence of a DP. In a similar vein, Ceglowski 2017 builds on various types of left-branch extractions and provides experimental data in support of this hypothesis. This said, we think that the empirical and theoretical arguments in favor of the DP hypothesis outweigh the arguments against it.

We begin this section with a simple but important argument in support of the DP status of kind-referring nominals. As discussed in §2.1, the existence of the DP projection in Slavic is relatively well-established (see Willim 2000 for Polish and Pereltsvaig 2007 for Russian, but see also footnote 2 for an important qualification). When present, the DETERMINER projection is responsible for the computation of reference, with the result that $DP \rightarrow INDIVIDUAL$ in the semantics.

Here, we follow Borer 2005 in adopting an even stronger assumption. Namely, we assume that the D head is the only source of referentiality, and that predicative NPs (type $\langle e, t \rangle$) cannot be type-shifted to individuals (type e) in the semantics. This amounts to an isomorphic mapping between syntax and semantics, which we can represent schematically as $DP \leftrightarrow individual$. From this perspective, any nominal which introduces a referent into the discourse should bear the syntactic hallmarks and distribution of a DP.

With this in mind, consider the two-sentence discourse in (6). On its most salient reading, the kind-referring subject *wieloryb* ‘the whale’ is co-referential with the pronoun *niego*. Since *wieloryb* licenses pronominal reference, it is, by hypothesis, a DP. Crucially, not all bare nouns in Polish are referential. Witness the inability of the bare plural *książki* ‘books’ to co-refer with the pronoun *je* in (7a). This is due to the PP *na książki* being part of a kind compound, with the modified NP corresponding to the English nominal compound *bookshelf*. Given that the inclusion of the demonstrative determiner in (7b) renders the DP obligatorily referential, we find further support for the $DP \leftrightarrow REFERENTIALITY$ connection.³

- (6) *Wieloryb_i jest na skraju wymarcia. Mimo to w niektórych*
whale.NOM.M is on verge extinction.GEN despite this in some
krajach ciągle się na niego_i poluje.
countries still REFL for him hunt
 ‘[The whale]_i is on the verge of extinction. Despite this, people still hunt it_i in some countries.’

- (7) a. # *Robert zbudował półkę na książki_j. Kupił je_j*
Robert.NOM built.PFV shelf.ACC for books.ACC.F bought.PFV them.F
wczoraj w księgarni.
yesterday in bookshop.LOC
 Intended: ‘Robert built a [book]_jshelf. He bought it_j / them_j yesterday in a bookshop.’

³From here, if not indicated otherwise, all examples are from Polish.

- b. *Robert zbudował półkę na [te książki]_j. Kupił*
 Robert.NOM built.PFV shelf.ACC for these books.ACC.F bought.PFV
je_j wczoraj w księgarni.
 them.F yesterday in bookshop.LOC
 ‘Robert built a shelf for [these books]_j. He bought them_j yesterday
 in a bookshop.’

Despite its relative merits, the argument based on reference can get us only so far. Even if our assumptions about the universal mapping from DP to individual are correct, we have only shown that kind-referring nominals are DPs, not that they are definite DPs. We still need to demonstrate that the relevant D head bears the feature definite, as opposed to being indefinite or simply unspecified for definiteness.⁴ This is what we aim to show in the remaining part of this section, drawing on novel evidence from object topicalization.

Consider the minimal pair in (8). The contrast between (8a) and (8b) relates to the cardinality of the set of girls introduced in the first sentence: while (8a) mentions a single girl, (8b) mentions several. The second sentence is identical in both examples, with the accusative object *dziewczynę* ‘girl’ appearing in the sentence-initial position and the nominative subject *przystojny mężczyzna* ‘handsome man’ coming last. The resulting OVS word order is informationally marked, as it deviates from the canonical Polish SVO. In the normal case, the fronted object is interpreted as the topic (TOP) of the sentence.⁵

As it turns out, the topicalized object is acceptable when the context set is singular (8a) but it is ruled out when the context set is plural (8b). From this, we conclude that topicalized objects impose a uniqueness presupposition on their referents, and hence that such objects are definite. This is in line with our intuitive conception of the topic as the informational anchor of a sentence, characterized by such properties as identifiability, familiarity and contextual uniqueness. What this means for our purposes, however, is that we can use object topicalization as a diagnostic of definiteness in kind-referring DPs.

⁴Crucially, indefinites are also referential DPs in the sense that they introduce variables which license pronominal co-reference (Heim 1982; Kamp & Reyle 1993).

⁵An anonymous reviewer points out that (8a) sounds best when the fronted object is accompanied by a demonstrative determiner. While we agree with this judgment, a bare DP is also acceptable in this context. Since the focus of this section is on the definite / indefinite opposition, we leave demonstratives out of the subsequent discussion.

- (8) a. *Na przyjęciu była jedna dziewczyna. Dziewczynę_{TOP} poprosił do tańca*
 at party.LOC was one girl.NOM girl.ACC asked to dance
przystojny mężczyzna.
 handsome.NOM man.NOM
 ‘There was one girl at the party. A handsome man asked the girl to a dance.’
- b. *Na przyjęciu było kilka dziewczyn. #Dziewczynę_{TOP} poprosił do*
 at party.LOC were several girls.NOM girl.ACC asked to
tańca przystojny mężczyzna.
 dance handsome.NOM man.NOM
 ‘There were several girls at the party. A handsome man asked the girl to a dance.’

Before extending this analysis to the domain of kinds, let us examine one more example from the domain of objects. In (9), the first sentence either does (9a) or does not (9b) involve topicalization of the object *kaktus* ‘cactus’. The follow-up sentence refers to another entity of the same kind, i.e. to a second cactus. If topicalized objects are definite, then (9a) is expected to presuppose the existence of a unique cactus, giving rise to a contradiction with subsequent material.⁶ This is indeed the case.⁷ As for the non-topicalized variant (9b), it seems that the object can be either definite or indefinite, with the latter interpretation strongly favored by the subsequent context.⁸

- (9) a. *Kaktusa_{TOP} podlała Maria. #Drugi kaktus nie potrzebował*
 cactus.ACC watered Mary.NOM second cactus.NOM not needed
jeszcze wody.
 yet water
 ‘Mary watered the cactus. The other cactus did not need water yet.’

⁶Recent work has shed some doubt on the presuppositional effect of topicalization (Seres & Borik 2021; Šimík & Demian 2020). We leave it as a future task to determine how these proposals affect our argumentation in the main text (if at all).

⁷This effect is relatively subtle, since the uniqueness presupposition can be pragmatically accommodated without giving rise to a contradiction. For example, one of the cacti might stand out by virtue of being exceptionally large or noteworthy or particularly dear to Mary’s heart. In that case, it would be possible to refer to it with a definite description, and the English translation of (9a) produces the same sort of “defeasible” infelicity. This qualification notwithstanding, the contrast between (9a) and (9b) is sufficiently robust to warrant the conclusions in the main text. For more on uniqueness and presupposition accommodation, see Frazier (2006), von Stechow (2008) and references therein.

⁸Note that the interaction of definiteness with topicalization, scrambling, intonation, and, to an extent, genericity has been observed previously, e.g. Szwedek (1974).

- b. *Maria podlala kaktusa. Drugi kaktus nie potrzebował*
 Mary.NOM watered cactus.ACC second cactus.NOM not needed
jeszcze wody.
 yet water
 ‘Mary watered a / the cactus. The other cactus did not need water yet.’

Having demonstrated that object topicalization correlates with definiteness, we can now carry our observations over from the object to the kind domain.

Recall that, according to Borik & Espinal (2012; 2015), definiteness is necessary for the emergence of direct reference to kinds. While the English definite *the lightbulb* refers to the maximal kind ‘lightbulb’, the indefinite *a lightbulb* refers only to its subkinds, including ‘halogen’, ‘fluorescent’ and ‘LED’. The choice between definite and indefinite gives rise to different semantic entailments. Consider an (idealized) scenario in which a successful patent application extends automatically from kinds to all of their subkinds. In that case, (10a) grants the evil corporation a patent on all lightbulbs, whether ‘incandescent’, ‘fluorescent’ or any other type. The meaning of (10b) is much weaker, since it gives the patentee intellectual rights to only one kind of lightbulb, e.g. ‘LED’ lights.

- (10) a. The evil corporation patented the lightbulb.
 b. The evil corporation patented a lightbulb.

With this in mind, consider the Polish examples below. According to conventional wisdom, Thomas Edison is the inventor of the kind ‘lightbulb’. This fact strongly biases the discourse in (11) towards the maximal kind reading of the object *żarówka* ‘lightbulb’. In contrast, the context in (12), which explicitly mentions several subkinds of lightbulbs, is compatible only with the SUBKIND reading of the bare nominal object. What makes this context necessary is that most Polish speakers interpret *kind predicate + bare object* constructions as referring to maximal kinds in out-of-the-blue situations.⁹ This default preference is especially strong when the ambiguous nominal is accompanied by a predicate like *wynaleźć* ‘invent’, which is more often applied to basic kinds (e.g. *the wheel, the computer, the alphabet*) than to their subkinds. However, when presented with a sufficiently rich context and a more balanced predicate, our informants readily accept that Polish bare nominals are ambiguous between definite kind reference and indefinite subkind reference.

⁹We thank an anonymous reviewer for raising this important issue.

- (11) *Przełomowe wynalazki są od dawna chronione prawem*
ground-breaking inventions are since long protected law.INST
patentowym.
patent.ADJ.INST
‘Ground-breaking inventions have long been protected by the patent law.’
- a. *Żarówkę_{TOP} opatentował w 1879 roku Tomasz Edison.*
lightbulb.ACC patented in 1879 year.LOC Thomas.NOM Edison.NOM
‘Thomas Edison patented the lightbulb in 1879.’
- b. *Tomasz Edison opatentował żarówkę już w 1879*
Thomas.NOM Edison.NOM patented lightbulb.ACC already in 1879
roku.
year.LOC
‘Thomas Edison patented the lightbulb already in 1879.’
- (12) *W 2019 roku firmy amerykańskie opatentowały cztery*
in 2019 year.LOC companies.NOM american.NOM patented four
rodzaje baterii i trzy rodzaje żarówek.
kinds.ACC batteries.GEN and three kinds.ACC lightbulbs.GEN
‘In 2019, American companies patented four kinds of batteries and three
kinds of lightbulbs.’
- a. *# Żarówkę_{TOP} opatentowała firma mojej żony.*
lightbulb.ACC patented company.NOM my.GEN wife.GEN
‘My wife’s company patented the lightbulb.’
- b. *Firma mojej żony opatentowała żarówkę.*
company.NOM my.GEN wife.GEN patented lightbulb.ACC
‘My wife’s company patented a / the lightbulb.’

With these caveats in place, let us return to the examples at hand. Given that topicalized objects are definite and that (11a) and (12a) involve object topicalization, we expect *żarówka* ‘lightbulb’ to exhibit the same range of readings as the English definite *the lightbulb*. Specifically, *żarówka* should admit definite kind reference and disallow indefinite subkind reference. In keeping with this prediction, (11a) is judged to be true while (12a) is deemed unacceptable. However, indefinite subkind reference becomes available when the object occupies its canonical postverbal position, as in (12b). Importantly, the availability of a subkind reading in (12b) parallels the availability of an indefinite reading in (9b).

To summarize our main findings in this section, we have argued that topicalized objects are definite (8a), (8b), (9a), and that they must refer to maximal kinds (11a), (12a). As for postverbal objects, they can be indefinite (9b), which makes it possible for them to denote subkinds (12b).¹⁰

Overall, our results strongly suggest that Polish kind-referring DPs are definite, just like the corresponding DPs in Romance and Germanic languages. In §3, we turn to the other component of Borik & Espinal's (2012) theory: the role of number in the derivation of kind, subkind and object readings.

3 Reference to kinds is numberless

According to Borik & Espinal 2012; 2015, kind-referring DPs are numberless. Since these nominals do not include a number projection, the traditional term 'definite singular kinds' turns out to be a misnomer.

We start by briefly outlining Borik & Espinal's theory in §3.1. This provides the background for our treatment of Polish kind-referring DPs in §3.2. By arguing that Polish nominals, in their kind-referring uses, are also numberless, we take them to be parallel to other cases treated in the literature, in terms of their underlying semantic and syntactic representation.

3.1 The semantics of number

Traditionally, number is assumed to take one of a small set of values. In the context of European languages, and English in particular, nominals are typically assumed to be either singular or plural. In line with Borik & Espinal (2012; 2015), we depart from this traditional view and argue that nominals may additionally be numberless, i.e. they may lack the number projection altogether. We thus distinguish three possibilities for the valuation of number: SINGULAR, PLURAL, and NUMBERLESS (corresponding to indefinite singular, bare plural and definite kinds, respectively).

Definite kinds are argued to be numberless rather than singular because they resist number-marking and do not permit the insertion of kind classifiers such

¹⁰Note that proper names and mass kind nominals can also undergo object topicalization. Does that mean that they are all definite DPs, like the corresponding nominals in some Romance languages? The answer depends at least partially on our assumptions about the syntax-semantics mapping (see our discussion at the beginning of this section). If syntax and semantics are isomorphic, then proper names and mass kinds are indeed expected to project full DP structure. For two influential syntactic approaches to reference and proper names, see Longobardi (1994; 2001; 2005), and Borer 2005.

as *kind of*, *species of*, and *type of* without the addition of number. Support comes, among others, from Spanish, where kind-referring subjects are grammatical only in the absence of any overt expression of number; see (13a) vs. (13b)–(13c).¹¹ Direct reference to the kind ‘fridge’ is blocked not only by plural inflection and overt numerals (13b), but also by kind classifiers (13c), which require number to project.

- (13) a. *La nevera se inventó en el siglo XVIII.*
the.SG fridge CL invented in the century XVIII.
‘The fridge was invented in the 19th century.’
- b. **Las (dos) neveras se inventaron en el siglo XVIII.*
the.PL (two) fridges CL invented in the century XVIII.
Intended: ‘The (two) fridges were invented in the 19th century.’
- c. **La clase de nevera se inventó en el siglo XVIII.*
the.SG class of fridge CL invented in the century XVIII.
Intended: ‘The type of fridge was invented in the 19th century.’
(Borik & Espinal 2012; Spanish)

In Borik & Espinal’s theory, the number projection is responsible for introducing the Carlsonian realization operator \mathbb{R} , which relates kinds to their spatiotemporal instantiations (see (14); see also Carlson 1977). This explains why direct kind reference is incompatible with number: the latter shifts NP denotations from the domain of kinds to the domain of objects. The formal denotation given to a singular number head in Borik & Espinal (2015) is reproduced below. According to (15), number turns the property of kinds supplied by the bare NP into a property of objects. This shift is effected by the realization operator \mathbb{R} .

- (14) THE REALIZATION OPERATOR
 $\mathbb{R}(x^k, y^o) \Leftrightarrow y^o$ instantiates x^k

$$(15) \quad \llbracket \text{NUMBER}^{-\text{PL}} \rrbracket = \lambda P_{\langle e^k, t \rangle} \lambda y^o. \exists x^k [P(x^k) \wedge \mathbb{R}(x^k, y^o) \wedge \text{ATOM}(y^o)]$$

Even though number is linked to the object domain, it still allows for subkind readings, as evidenced by the English examples below. While the definite subject in (16a) refers directly to the kind ‘tiger’, and so cannot be used contrastively, its

¹¹ Although the definite subject takes a singular determiner in (13a), we follow Borik & Espinal in assuming that this is simply a default morphophonological realization and that the feature singular is neither syntactically nor semantically present in this DP.

counterparts involving demonstrative determiners (16b) and numerals (16c) are acceptable in the same context. Similarly, quantification over subkinds is also possible, as in (16d). Borik & Espinal assume that demonstratives, numerals and quantifiers all require the projection of number. Accordingly, they conclude that reference to subkinds is mediated by number, and that subkind denotations are derived from object denotations either via coercion (Borik & Espinal 2012) or via type-shifting (Borik & Espinal 2015).

- (16) a. The tiger is on the verge of extinction (*but that one is not).
 b. This / That tiger is on the verge of extinction (but that one is not).
 c. One tiger is on the verge of extinction (but six are not).
 d. No / Some / Every tiger is on the verge of extinction.

In sum, Borik & Espinal propose that direct reference to kinds is possible only in the absence of number. Since number encodes the \mathbb{R} operator, its projection shifts NP denotations from the kind domain to the object domain. As for subkind readings, they are derived from object readings in the presence of number.

3.2 Numberless kinds in Polish

By considering data from Spanish and English regarding the status of number in kind- vs. object-referring DPs, we have established that the projection of number blocks direct reference to kinds. Instead, only reference to objects or subkinds is licensed. We now apply the same logic to Polish.

First, the overt presence of number clearly blocks direct kind reference in Polish. Number can be realized overtly by demonstratives (17a), numerals (17b), and quantifiers (17c). A nominal expression incorporating any of these elements may range over objects or subkinds, but crucially it may not refer to the kind ‘tiger’ directly.

- (17) a. *{Ten / Tamten} tygrys wymarł w XX wieku.*
 this that tiger.NOM went extinct in 20th century
 ‘{This / That} (kind of) tiger went extinct in the 20th century.’
 b. *Jeden tygrys jest na skraju wymarcia.*
 one tiger.NOM is on verge.LOC extinction.GEN
 ‘One (kind of) tiger is on the verge of extinction.’
 c. *{Jakiś / Każdy} tygrys jest zagrożony wymarciem.*
 some every tiger is threatened extinction.INST
 ‘{Some / Every} tiger is under threat of extinction.’

Further, the insertion of kind classifiers in (18) is similarly incompatible with direct kind reference. The only reading available involves existential quantification over subkinds, as suggested by the use of the indefinite article in the English translation. Crucially, recall that English and Spanish do not permit the definite article to co-occur with kind classifiers either (although cf. (29) for a possible qualification of this claim).

- (18) {Rodzaj / Gatunek / Typ} tygrysa jest zagrożony wymarciem.
 kind species type tiger.GEN is threatened extinction.INST
 ‘A {kind / species / type} tiger is under threat of extinction.’

Thus, Polish behaves like English and Spanish in that it has three possible values for number: plural, singular, and numberless, with the latter two realized as the singular morphological form. Overall, the properties of Polish kind-referring DPs are in line with those of Romance and Germanic kind nominals. In the next section, we build on the results of §2 and §3 to address the issue of kind modification.

4 Kind modification

4.1 Introduction

Having argued that the denotation of kinds in Polish is underlyingly the same as in other languages, we now turn to the question of how to represent subkinds.

There are two main semantic routes leading from properties of kinds to properties of subkinds. The first route was illustrated in §3 in connection with the examples in (17), with (17b) repeated as (19) below. According to Borik & Espinal, the presence of morphosyntactic number shifts NP denotations from properties of kinds to properties of objects, which can then be coerced or type-shifted into subkind denotations in the appropriate context. Crucially, this way of referring to subkinds relies on the presence of number in the syntax and semantics.

- (19) Jeden tygrys jest na skraju wymarcia.
 one tiger.NOM is on verge extinction.GEN
 ‘One (kind of) tiger is on the verge of extinction.’

The second route from kinds to subkinds is by way of kind modifiers. The NP *Bengal tiger* is a typical example, with the kind modifier *Bengal* selecting a specific subkind (or set of subkinds) from the denotation of *tiger*. The corresponding example in Polish, featuring the classifying adjective *bengalski*, is presented directly below.

- (20) *Tygrys bengalski jest na skraju wymarcia.*
 tiger.NOM Bengal.M is on verge extinction.GEN
 ‘The Bengal tiger is on the verge of extinction.’

In recent years, our understanding of kind modification has significantly improved thanks to the work of McNally & Boleda (2004) on relational nouns in Catalan, as well as to Wągiel (2014) on classifying adjectives in Polish and Borik & Espinal (2015) on kind modifiers in Spanish. On their approach, the composition of nouns and their modifiers is intersective, proceeding via the composition rule of PREDICATE MODIFICATION (see Heim & Kratzer 1998). In the case of *Bengal tiger*, the set of kinds denoted by $\llbracket \text{tiger} \rrbracket = \{\text{BENGAL TIGER, SIBERIAN TIGER, ...}\}$ intersects with the set of kinds denoted by $\llbracket \text{Bengal} \rrbracket = \{\text{BENGAL TIGER, BENGAL CAT, ...}\}$, yielding the correct denotation for the modified NP.

In §4.2, we point out that the intersective approach to kind modification is incompatible with the theory of definite numberless kinds proposed by Borik & Espinal (2012; 2015). This tension is due to their differing assumptions about the denotation of bare nouns like *tiger*. While McNally & Boleda (2004) assume that nouns denote the maximal kind and all of its subkinds, Borik & Espinal (2012) presuppose that nouns denote singleton sets of kinds. §4.3 elaborates on this problem and lays the groundwork for a solution. Finally, in §4.4, we integrate the two theories by introducing a subkind operator into the semantics and linking it to a functional head in the syntax. This operator derives properties of subkinds from properties of kinds, thus allowing for intersective kind modification.

4.2 Incompatibility with intersective kind modification

The simplest way to bring out the tension between intersective kind modification and definite numberless kinds is to go through a pair of step-by-step derivations. We start by deriving direct kind reference in (21), with the ι operator applying to the kind predicate denoted by *tiger*.

- (21) a. $\llbracket [\text{NP tygrys}] \rrbracket = \lambda x^k. \text{TIGER}(x^k)$
 b. $\llbracket [\text{DP DEF } [\text{NP tygrys}]] \rrbracket = \iota x^k. \text{TIGER}(x^k)$

The derivation in (22) is slightly more complex, as it involves modification by the classifying adjective *bengalski* ‘Bengal’. It begins with the definitions of $\llbracket \text{tygrys} \rrbracket$ and $\llbracket \text{bengalski} \rrbracket$, both of which denote simple properties of kinds (22a)–(22b). These properties are subsequently conjoined in (22c) and bound by the ι operator in (22d). The result, a kind-level individual, has the appropriate semantic type to

combine with the kind-level predicate *być na skraju wymarcia* ‘to be on the verge of extinction’ in (20) above.

- (22) a. $\llbracket [\text{NP tygrys}] \rrbracket = \lambda x^k. \text{TIGER}(x^k)$
 b. $\llbracket [\text{AP bengalski}] \rrbracket = \lambda x^k. \text{BENGAL}(x^k)$
 c. $\llbracket [\text{NP tygrys} [\text{AP bengalski}]] \rrbracket = \lambda x^k. \text{TIGER}(x^k) \wedge \text{BENGAL}(x^k)$
 d. $\llbracket [\text{DP DEF} [\text{NP tygrys} [\text{AP bengalski}]]] \rrbracket =$
 $\iota x^k. \text{TIGER}(x^k) \wedge \text{BENGAL}(x^k)$

The problem with the derivations in (21) and (22) is that they make distinct assumptions about the membership of the set of kinds corresponding to $\llbracket \text{tiger} \rrbracket$. Beginning with definite kind reference, the fact that the ι operator can apply to $\llbracket \text{tiger} \rrbracket$ in (21b) entails that $\llbracket \text{tiger} \rrbracket$ is a singleton set containing only the maximal kind ‘tiger’. In other words, this derivation assumes that NP denotations are atomic, as illustrated in Figure 1 below, where the outlined area corresponds to the denotation of the NP.¹²

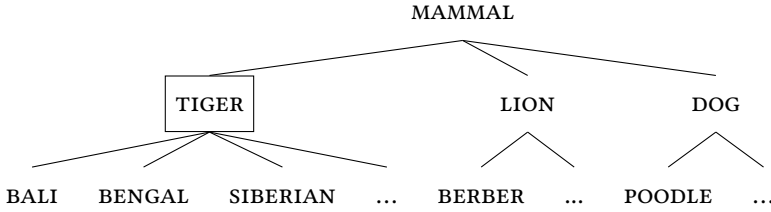


Figure 1: Atomic NP denotations

Turning now to modified kind reference in (22), it is incompatible with $\llbracket \text{tiger} \rrbracket$ being a singleton set, since $\llbracket \text{tiger} \rrbracket$ must be able to intersect with the set $\llbracket \text{Bengal} \rrbracket$ in a non-trivial manner. This suggests that the subkind ‘bengal tiger’ is also a

¹²One might wonder if the assumption of atomic NP denotations is a necessary conclusion from (21). A possible alternative would be to replace the ι operator with a maximality operator MAX defined over sets of pluralities. On its kind referring reading, *the tiger* would then receive a similar analysis to *the boys* in the object domain, picking out the maximal individual in the denotation of a cumulative NP. The problem with this line of thinking is that the domain of kinds is not organized in a semi-lattice structure à la Link (1983). In addition, this theory makes some incorrect empirical predictions. If definite kinds are underlyingly maximal plurals, we expect the sentence *Charles Babbage invented the computer* to be roughly synonymous with *Charles Babbage invented every kind of computer*. Needless to say, this prediction is not borne out. (For further discussion of the entailments licensed by the predicates *invent* and *be extinct*, see Mueller-Reichau 2013).

member of $\llbracket \text{tiger} \rrbracket$. In that case, however, we are no longer dealing with atomic NP denotations.

Rather, for the derivation to work, NPs must have taxonomic denotations, corresponding to the contents of the rectangle in Figure 2.¹³

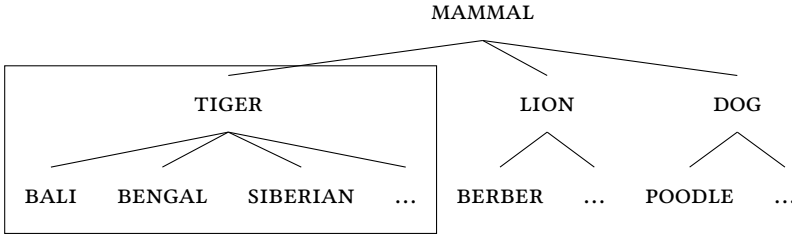


Figure 2: Taxonomic NP denotations

4.3 Towards a solution

The incompatibility between atomic and taxonomic NP denotations leaves us with three options. We can (i) abandon [Borik & Espinal's \(2012\)](#) theory of definite numberless kinds, (ii) abandon [McNally & Boleda's \(2004\)](#) theory of intersective kind modification, or (iii) find a way of reconciling the two, thus preserving their individual insights and contributions.

Let us begin by considering option (i). Recall that atomic NP denotations follow from the assumption that definiteness translates into [Partee's \(1987\)](#) ι operator, which presupposes UNIQUENESS. However, other approaches to the semantics of definiteness have been proposed in the literature. The as-of-yet unresolved debate around the underlying nature of definiteness has focused on aspects thereof that are not directly related to kind and subkind reference. For instance, [Schwarz \(2009\)](#) (and subsequent work in [Schwarz 2013](#)) breaks down definite determiners into the morphosyntactically identifiable components of FAMILIARITY and uniqueness. [Coppock & Beaver \(2014; 2015\)](#) elaborate on the notion of definiteness as uniqueness. They argue that DETERMINACY and definiteness are distinct

¹³Perhaps the most influential study to assume taxonomic NP denotations is [Dayal 2004](#). However, since Dayal derives kind reference via the ι operator, as already discussed in §2.1, she still needs a mechanism for restricting NP denotations to atomic kinds; otherwise, composition with the ι operator would violate uniqueness. The question, then, is whether atomic denotations are to be derived from taxonomic ones or the other way around. To the extent that taxonomic denotations are structurally more complex, involving the projection of number or the insertion of kind modifiers, we agree with [Borik & Espinal \(2012; 2015\)](#) that atomic denotations are more basic.

by providing examples of definites which have an indeterminate interpretation, and therefore do not presuppose existence. Ultimately, however, these alternative proposals agree that uniqueness is a crucial component of definiteness. As such, they are not incompatible with the hypothesis that NPs denote singleton sets of kinds.

An alternative approach would be to adopt Löbner’s (1985) idea of definiteness as “unequivocal identifiability”.¹⁴ This conception of definiteness can be reconciled with taxonomic NP denotations if we assume that maximal kinds are unequivocally identifiable in Löbner’s sense due to their position at the top of the taxonomic hierarchy. This is an intriguing hypothesis, but it remains to be seen whether it can be formalized in precise terms, and what kind of taxonomic structure it requires. We thus leave this possibility for future work and retain the assumption of atomic NP denotations for the rest of this paper.

What about the second option, i.e. abandoning our commitment to intersective kind modification? Indeed, Borik & Espinal seem to have tacitly adopted this solution in their more recent work (see Borik & Espinal 2020; 2018). In their representation of the Russian modified kind nominal *slon afrikanskij* ‘African elephant’, the adjective has the semantic type $\langle\langle e^k, t \rangle, \langle e^k, t \rangle\rangle$, which makes it a function from properties of kinds to properties of kinds. Borik & Espinal’s revised syntax and semantics for modified kinds is reproduced in (23) below.

$$(23) \quad \llbracket [\text{DP DEF } [\text{NP slon } [\text{AP afrikanskij}]]] \rrbracket = \lambda x^k. (\llbracket \text{afrikanskij} \rrbracket (\llbracket \text{slon} \rrbracket)) (x^k)$$

As it stands, (23) leaves a number of questions unanswered. Most importantly, it does not specify how the adjectival function affects the denotation of the noun. What is the precise relationship between $\lambda x^k. \llbracket \text{slon} \rrbracket (x^k)$, on the one hand, and $\lambda x^k. (\llbracket \text{afrikanskij} \rrbracket (\llbracket \text{slon} \rrbracket)) (x^k)$, on the other? Without this information, it is impossible to verify whether (23) derives the correct truth conditions for *slon afrikanskij*.

One simple possibility is that $\llbracket \text{afrikanskij} \rrbracket$ takes the property of kinds denoted by $\llbracket \text{slon} \rrbracket$ and conjoins it with the predicate of African kinds, yielding the result in (24c). The composition process no longer relies on predicate modification, proceeding exclusively via FUNCTION APPLICATION instead. Still, (24) fails for the same reason as the derivation in (22): if $\llbracket \text{slon} \rrbracket$ denotes a singleton set of kinds, then its intersection with the set of African kinds is an empty set.

$$(24) \quad \begin{array}{ll} \text{a. } \llbracket \text{slon} \rrbracket = \lambda x^k. \text{ELEPHANT}(x^k) \\ \text{b. } \llbracket \text{afrikanskij} \rrbracket = \lambda P_{\langle e^k, t \rangle} \lambda x^k. [P(x) \wedge \text{AFRICAN}(x)] \\ \text{c. } \llbracket \text{slon afrikanskij} \rrbracket = \lambda x^k. [\text{ELEPHANT}(x) \wedge \text{AFRICAN}(x)] \end{array}$$

¹⁴We would like to thank an anonymous reviewer for bringing up this possibility.

Let us see, then, if we can improve on the idea in (24). Our starting assumption is that $\llbracket \text{slon} \rrbracket$ denotes a singleton set of kinds (25a) and that $\llbracket \text{afrikanskij} \rrbracket$ maps properties of kinds onto other properties of kinds by means of some yet-to-be-specified function FUNC :

- (25) a. $\llbracket \text{slon} \rrbracket = \lambda x^k . \text{ELEPHANT}(x^k)$
 b. $\llbracket \text{afrikanskij} \rrbracket = \lambda P_{\langle e^k, t \rangle} \lambda y^k . \text{FUNC}(P)(y^k)$
 c. $\llbracket \text{slon afrikanskij} \rrbracket = \lambda y^k . \text{FUNC}(\lambda x^k . \text{ELEPHANT}(x^k))(y^k)$

What are the minimal requirements for the content of FUNC ? Since FUNC can take the singleton set of kinds $\{\text{ELEPHANT}\}$ as an input and return the set $\{\text{AFRICAN ELEPHANT}\}$ as an output, it must necessarily incorporate some sort of a subkind operator in its definition. The subkind operator, defined in (26) below, is a dyadic relation between kinds and their subkinds (which are also in the kind domain).¹⁵ In effect, FUNC is now able to derive a set of subkinds $\{\text{AFRICAN ELEPHANT}, \text{ASIAN ELEPHANT}, \text{INDIAN ELEPHANT}, \dots\}$ from the input set $\{\text{ELEPHANT}\}$.

- (26) THE SUBKIND OPERATOR
 $\text{SK}(x^k, y^k) \Leftrightarrow y^k \text{ is a subkind of } x^k$

What remains is for FUNC to select the appropriate subkind from this set. This can be plausibly achieved by intersecting this set with the set of African kinds $\text{AFRICAN} = \{\text{AFRICAN ELEPHANT}, \text{AFRICAN GIRAFFE}, \text{AFRICAN LANGUAGE}, \text{AFRICAN MUSIC}, \dots\}$, much in the spirit of McNally & Boleda's (2004). Without postulating such a set of African kinds, the systematic contribution of the adjective $\llbracket \text{afrikanskij} \rrbracket$ to the meaning of $\llbracket \text{N afrikanskij} \rrbracket$ (roughly, 'specific to Africa') cannot be captured.

In light of the above, we propose the following definition of the kind-modifying function FUNC . In our view, the classifying adjective $\llbracket \text{afrikanskij} \rrbracket$ takes a property of kinds P as an input, derives from it a property of P -subkinds by means of the SK operator, and finally conjoins that property with the kind predicate AFRICAN (27b). The result of applying (27b) to (27a) is a predicate of AFRICAN kinds that stand in a subkind relation to the kind 'elephant', i.e. a description of the kind 'african elephant' (27c).

¹⁵Other suggestions for operators relating kinds to subkinds have been made, most notably by Krifka et al. 1995: 77. Krifka et al.'s (1995) taxonomic subkind relation τ relates a subkind x to a (basic level) kind y in an asymmetric and transitive manner: $\tau(x, y)$. However, this account makes no explicit assumptions about the relationship between kinds and subkinds, and in particular, it does not comment on the mechanism of kind-modification. Rather, Krifka et al. (1995) focus on the distinction between the domain of kinds and the domain of objects.

- (27) a. $\llbracket \text{slon} \rrbracket = \lambda x^k. \text{ELEPHANT}(x^k)$
b. $\llbracket \text{afrikanski} \rrbracket = \lambda P_{\langle e^k, t \rangle} \lambda y^k. \exists x^k [P(x^k) \wedge \text{SK}(x^k, y^k) \wedge \text{AFRICAN}(y^k)]$
c. $\llbracket \text{slon afrikanski} \rrbracket = \lambda y^k. \exists x^k [\text{ELEPHANT}(x^k) \wedge \text{SK}(x^k, y^k) \wedge \text{AFRICAN}(y^k)]$

We are now in the position to verify whether a non-intersective analysis of kind modification, with the adjective *afrikanski* denoting a complex function from properties of kinds to properties of kinds, allows us to avoid the contradiction identified in §4.2. The short answer is yes. By hard-wiring the *SK* operator into the denotation of kind modifiers, we can maintain our assumption that NPs denote sets of atomic kinds and still derive modified kinds along the lines of Borik & Espinal; Borik & Espinal's (2012; 2015) theory.

However, the assignment of the complex type $\langle \langle e^k, t \rangle, \langle e^k, t \rangle \rangle$ to classifying adjectives comes at a certain cost. Barring the possibility of type-shifting, kind modifiers are now locked to the attributive position, contrary to empirical fact (28).

- (28) a. *Ten rodzaj / gatunek / typ / słonia jest afrykański, a tamten jest azjatycki.*
this.NOM kind.NOM species.NOM type.NOM elephant.GEN is
African.NOM and that.NOM is Asian.NOM
'This {kind/species/type} of elephant is African and that one is Asian.'
b. *Ten rodzaj szczoteczki jest elektryczny.*
this kind.NOM toothbrush.GEN is electric.NOM
'This kind of toothbrush is electric.'

Furthermore, if the lexical entries of classifying adjectives encode their own *SK* operators, then the DP *afrykański rodzaj słonia* 'African kind of elephant' should range exclusively over subkinds of subkinds of the kind 'elephant', including such specialized kinds as 'African forest elephant' and 'African bush elephant'. This is because the classifying adjective *afrykański* and the kind classifier *rodzaj* would each introduce an instance of the *SK* operator into the semantic derivation. Contrary to this prediction, definite subkind reference to 'African elephant' is possible in (29a), derived via a single application of the *SK* operator.¹⁶

¹⁶Indefinite subkind reference is also available for the subject of (29a), but we assume that it involves the projection of number, analogously to the variant with the overt cardinal below:

- (i) *Jeden afrykański rodzaj słonia jest na granicy wymarcia.*
one African.NOM kind.NOM elephant.GEN is on verge.LOC extinction.GEN
'One African kind of elephant is on the verge of extinction.'

- (29) a. *Afrykański {rodzaj / gatunek / typ} słonia jest na granicy wymarcia.*
 African.NOM kind.NOM species.NOM type.NOM elephant.GEN is
 on verge.LOC extinction.GEN
 ‘{The / An} African { kind / species / type } of elephant is on the verge of extinction.’
- b. *{Rodzaj / Gatunek / Typ} słonia jest na granicy wymarcia.*
 kind.NOM species.NOM type.NOM elephant.GEN is on verge.LOC
 extinction.GEN
 ‘A { kind / species / type } of elephant is on the verge of extinction.’

In light of this result, consider the final contrast between (29a) and (29b), with and without the classifying adjective. The former licenses definite reference to ‘African elephant’, while the latter admits only indefinite subkind reference, similarly to their English translations. This asymmetry can be explained if $\llbracket \text{rodzaj słonia} \rrbracket$ in (29b) corresponds to a plural set of subkinds, which does not satisfy the uniqueness presupposition on the ι operator, thereby excluding the definite reading. But if we first conjoin $\llbracket \text{rodzaj słonia} \rrbracket$ with $\llbracket \text{afrykański} \rrbracket$, the result might well be a singleton set, rendering definite subkind reference licit in (29a).

In sum, while abandoning intersective kind modification removes the contradiction pointed out in §4.2, the hypothesis that classifying adjectives have the semantic type $\langle \langle e^k, t \rangle, \langle e^k, t \rangle \rangle$ and that they lexicalize the sk operator runs afoul of the empirical facts in (28)–(29). For this reason, we hold on to McNally & Boleda’s (2004) and Wągiel’s (2014) assumption that kind modifiers are simple properties of kinds (contra Borik & Espinal 2018). In the next section, we show how to reconcile this assumption with the theory of definite numberless kinds. Tightening the link between syntactic structure and interpretation, our proposal links the appearance of the sk operator to the projection of a $\text{SUBKINDP}(\text{HRASE})$ in the syntax.

4.4 A structural approach to kind modification

We assume the following structure for *słoń afrykański* on its subkind reading:

- (30) $[_{\text{DP DEF}} [_{\text{SubkindP}} [_{\text{AP afrykański}}] [_{\text{Subkind}'} \text{Subkind} [_{\text{NP słoń}}]]]]$

This structure incorporates a syntactic projection labelled SubkindP. This projection is the structural locus of the sk operator. The NP is in the complement

the structural approach to kind modification, according to which classifying adjectives are associated with a dedicated subkind projection in the syntax.¹⁷

Having touched upon the issue of linearization, we now turn to the empirical consequences of our proposal. One advantage of positing a syntactic SubkindP is that it enables us to model the definite subkind reading of *afrykański rodzaj słonia* in (29a), repeated as (32) below. We assign this DP the syntactic structure in (33). Our claim is that the kind classifier *rodzaj* ‘kind’ is an overt realization of the subkind head. This move not only captures the semantics of kind classifiers, which license the *sk* operator, but it also accounts for their co-occurrence with classifying adjectives.

- (32) *Afrykański { rodzaj / gatunek / typ } słonia jest na*
 African.NOM kind.NOM species.NOM type.NOM elephant.GEN is on
granicy wymarcia.
 verge.LOC extinction.GEN
 ‘{The / An} African { kind / species / type } of elephant is on the verge of extinction.’

- (33) [DP D [SubkindP [AP *afrykański*] [Subkind' rodzaj [NP *słonia*]]]]

Furthermore, if the structural approach is on the right track, it appears that we must allow the Subkind head to be recursive. A recursive application of the *sk* operator is clearly necessary to derive such examples as (34), (35), and (36), all of which refer to subkinds of subkinds.¹⁸ At a sufficiently abstract level of representation, the examples in (34)–(36) share the same underlying structure, with two Subkind projections inserted between the NP and the DP layers.

- (34) a. *polska literatura współczesna*
 Polish.ADJ literature.NOM contemporary.ADJ
 ‘contemporary Polish literature’
 b. [DP D [Subkind2P *polska* [Subkind2' Subkind₂ [Subkind1P *współczesna*
 [Subkind1' Subkind₁ [NP *literatura*]]]]]]

¹⁷For further discussion of the nominal syntax in Polish, see Cegłowski 2017, Witkoś et al. 2018, and Witkoś & Dziubała-Szrejnbowska 2018.

¹⁸We thank an anonymous reviewer for raising the issue of recursive subkind derivation, and for asking us to discuss examples (35) and (36) specifically.

- (35) a. *ten słoń afrykański*
this elephant.NOM African.ADJ
'this (kind of) African elephant'
b. [DP ten [Subkind₂P Subkind₂ [Subkind₁P afrykański [Subkind₁' Subkind₁
[NP słoń]]]]]
- (36) a. { *rodzaj / gatunek / typ* } *slonia afrykańskiego*
kind.NOM species.NOM type.NOM elephant.GEN African.ADJ.GEN
'a {kind / species / type} of African elephant'
b. [DP D [Subkind₂P rodzaj [Subkind₁P afrykańskiego [Subkind₁' Subkind₁
[NP slonia]]]]]
- (37) a. *afrykański { rodzaj / gatunek / typ } slonia*
African.NOM kind.NOM species.NOM type.NOM elephant.GEN
'{the / an} African {kind / species / type} of elephant'
b. [DP D [Subkind₁P [AP afrykański] [Subkind₁' rodzaj [NP slonia]]]]

To derive the modified nominal in (34), which refers to a subkind of contemporary literature, all we need to assume is that the adjectives *polska* 'Polish' and *współczesna* 'contemporary' occupy the specifier positions of Subkind₂P and Subkind₁P, respectively. As for the subkind-of-a-subkind reading of (35), the AP *afrykański* 'African' occupies the lower SpecSubkind₁P, while Subkind₂P projects covertly to provide focus alternatives for the demonstrative determiner (i.e. *this* subkind of African elephant, but not *that* one). Example (36) is very similar to (35), with the main difference that the higher Subkind₂ head is realized overtly by one of the kind classifiers *rodzaj / gatunek / typ*.

In closing, consider the contrast between *rodzaj.NOM slonia.GEN afrykańskiego.GEN* (36) and *afrykański.NOM rodzaj.NOM slonia.GEN* (37) (the latter repeated from (32) above). Although these examples are similar on the surface, their interpretation differs in a way directly predicted by our account. In (36), the classifying adjective *afrykański* and the kind classifier *rodzaj* occupy distinct Subkind projections, yielding the recursive subkind-of-a-subkind reading. The existence of two Subkind projections in (36) is supported by the following considerations: i) the adjective *afrykański* agrees with the lexical noun *słoń* rather than with the kind classifier *rodzaj*, and ii) the adjective and the kind classifier are not linearly adjacent.

In contrast, the adjective in (37) agrees with the kind classifier in gender, number and case. It also immediately precedes the kind classifier in the linear order.

This suggests that they originate in one and the same SubkindP, as argued already at the end of §4.3 (see example (29a) and the surrounding discussion). As expected, while the nominal in (36) ranges exclusively over subkinds of subkinds, (37) may refer directly to the subkind ‘African elephant’. The structural approach to kind modification, together with the assumption that the subkind head may be recursive, successfully captures this subtle semantic contrast.

4.5 Possible extensions

One outstanding question concerns the relationship between the subkind operator *sk* and the realization operator *R* (introduced in SubkindP and NumberP, respectively). As has been amply demonstrated, subkind readings are normally available in the presence of number (see especially §3.2). Indeed, it was this observation which motivated Borik & Espinal (2012; 2015) to hypothesize that subkind denotations are built on number. According to their analysis, subkind readings are derived from object readings by means of coercion or type-shifting.

However, since we have explicitly denied the existence of type-shifting in §2.2, we must find an alternative explanation for the co-occurrence of number and subkind interpretation. Below, we outline a possible solution to this problem.

Our proposal assumes the existence of a Classifier phrase in the nominal extended projection. This functional head is ordered between NumberP and NP (see Borer 2005 and Picallo 2006, among others).

For concreteness, we adopt the particular proposal of Kratzer (2007), according to which ClassifierP derives a set of singular atoms from the kind property supplied by the NP. This means that [−plural] is the default value of number (as per Borik & Espinal’s assumptions). Plural denotations are derived at the [+plural] head via the operation of sum closure. As a result, the internal structure of a DP looks as in Figure 3.

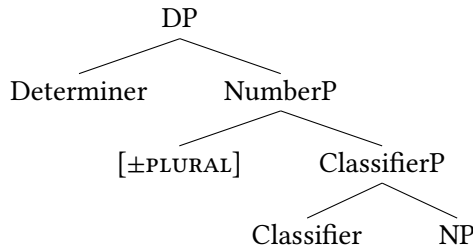


Figure 3: The extended projection of N

Tentatively, we propose that SubkindP is simply a type or ‘flavor’ of ClassifierP rather than an independent piece of functional structure. If this is on the right track, then its co-occurrence with NumberP is fully expected. We further assume that ClassifierP is the locus of the realization operator \mathcal{R} (contra Borik & Espinal 2012; 2015, who attribute \mathcal{R} to number). Thus, depending on its particular value, Classifier can introduce either the \mathcal{SK} or the \mathcal{R} operator into the semantic derivation. When \mathcal{SK} is present, $\llbracket \text{ClassifierP} \rrbracket$ denotes a set of atomic subkinds. When \mathcal{R} appears, $\llbracket \text{ClassifierP} \rrbracket$ translates as a set of atoms from the object domain. The presence of [+plural] renders both of these sets cumulative.

Given our discussion of recursive subkinds at the end of §4.4, we must allow for the presence of multiple classifier heads in the syntactic structure. But does this mean that $\text{CLASSIFIER}[\mathcal{SK}]$ and $\text{CLASSIFIER}[\mathcal{R}]$ may alternate and interleave in a completely unrestricted manner? Not if we let semantics constrain the output of syntactic derivations. We propose that the iteration of classifier heads is constrained by the semantic restrictions on the application of the \mathcal{SK} and \mathcal{R} operators. On the one hand, we expect $\text{CLASSIFIER}[\mathcal{SK}]$ to iterate freely. This is because its input (a set of kinds) is of the same type as its output (another set of kinds), which is a necessary condition for recursion. On the other hand, $\text{CLASSIFIER}[\mathcal{R}]$ shifts nominal denotations from the domain of kinds to the domain of objects. As such, it can apply at most once following all applications of \mathcal{SK} .

Finally, we must explain why the projection of number is incompatible with direct reference to kinds, admitting only object or subkind reference (see §3 for the relevant discussion). To account for this observation, it is enough to assume that the projection of number entails the projection of Classifier, and hence the appearance of \mathcal{R} or \mathcal{SK} in the semantics. This a natural conclusion to draw, especially if Classifier is responsible for determining the unit of counting, as is commonly assumed. In fact, the claim that NumberP can project if and only if ClassifierP projects is made explicitly in Picallo 2006.

In sum, by adopting the classifier projection and identifying it as the locus of the \mathcal{SK} and \mathcal{R} operators, we have been able to account for all the data covered by Borik & Espinal’s original theory. What is more, we have done so without resorting to type-shifting or coercion as the source of subkind interpretations. According to our analysis, all subkind readings, whether triggered by number, kind modifiers, or kind classifiers, are derived in a uniform manner: they involve the projection of ClassifierP/SubkindP, which introduces the \mathcal{SK} operator into their semantics.

5 Conclusion

In this paper, we have argued that Polish kind-referring nominals have the same syntax and semantics as their counterparts in Romance and Germanic languages. Specifically, we have shown that Polish kind nominals are definite, as supported by the evidence from object topicalization. We have also shown that they are numberless, extending the conclusions of [Borik & Espinal \(2012; 2015\)](#) drawn on the basis of English, Spanish, and Russian data.

The main argument pursued in this paper concerns the incompatibility between [Borik & Espinal's](#) theory of definite numberless kinds and [McNally & Boleda's \(2004\)](#) idea of intersective kind modification. While the former presupposes atomic NP denotations, the latter assumes that NPs denote entire taxonomies. We have shown that atomic NPs can combine with kind modifiers only through the mediation of the subkind operator sk . By linking this operator to a SubkindP in the syntax, we have been able to account for some new data involving the co-occurrence of kind modifiers and kind classifiers.

In addition to that, we have made the tentative suggestion that SubkindP is a type of a more general Classifier projection, the latter assumed already in [Borer \(2005\)](#), [Picallo \(2006\)](#), and [Kratzer \(2007\)](#). By transferring the Carlsonian realization operator R from the number to the Classifier head, we did away with the need for type-shifting in the semantics. Instead, we have provided a uniform structure for all cases of reference to subkinds, whether achieved through number, classifying adjectives and/or kind classifiers: all of these constructions involve the projection of a Classifier[sk] on top of the NP.

We summarize the whole system directly below. In (38)–(42), we list the semantic denotations of all the elements which enter into our analysis.

(38) DEFINITENESS

$$\llbracket D[+DEF] \rrbracket = \lambda P.\lambda x[P(x)]$$

(39) NUMBER

a. $\llbracket NUM[+PL] \rrbracket = \lambda P\lambda x.*P(x)$

b. $\llbracket NUM[-PL] \rrbracket = \lambda P\lambda x.P(x)$

(40) THE REALIZATION OPERATOR

a. $R(x^k, y^o) \Leftrightarrow y^o$ instantiates x^k

b. $\llbracket Classifier[R] \rrbracket = \lambda P_{\langle e^k, t \rangle} \lambda y^o. \exists x^k [P(x^k) \wedge R(x^k, y^o)]$

(41) THE SUBKIND OPERATOR

- a. $\text{sk}(x^k, y^k) \Leftrightarrow y^k$ is a subkind of x^k
- b. $\llbracket \text{Classifier}[\text{sk}] \rrbracket = \lambda P_{\langle e^k, t \rangle} \lambda y^k. \exists x^k [P(x^k) \wedge \text{sk}(x^k, y^k)]$

(42) ATOMIC NP DENOTATIONS

$$\llbracket \text{NP} \rrbracket = \lambda x^k. P_{\text{NOUN}}(x^k) \wedge |P_{\text{NOUN}}| = 1$$

The final structures assigned to kind-, subkind- and object-denoting definite DPs are presented in Figures 4, 5, and 6, respectively.

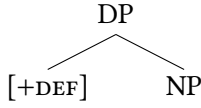


Figure 4: The structure of a definite kind nominal

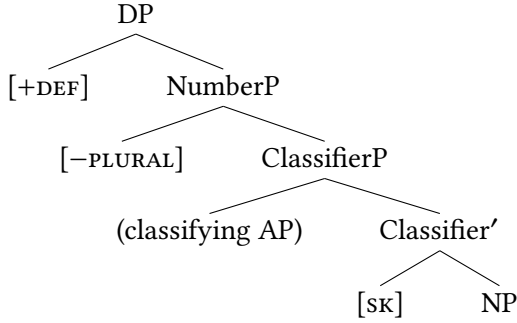


Figure 5: The structure of a definite (modified) subkind nominal

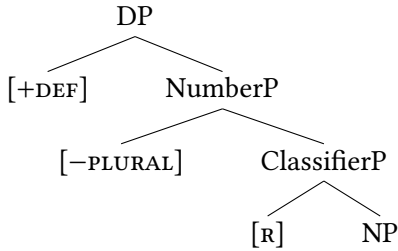


Figure 6: The structure of a definite object-level nominal

Finally, Figure 7 shows that NumberP projects only in the presence of ClassifierP. By introducing one of the operators R or SK , the Classifier head blocks direct reference to kinds and triggers reference to objects or subkinds instead. This derives Borik & Espinal’s central observation that definite kind-referring DPs are necessarily numberless.

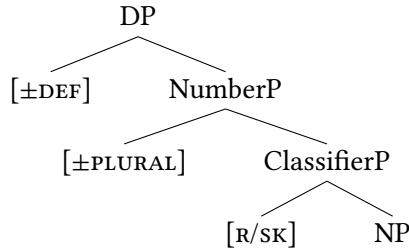


Figure 7: NumberP requires the projection of ClassifierP

If our analysis is on the right track, the mapping between syntactic structure and semantic interpretation is very nearly isomorphic. In this way, our work extends the line of research starting with Krifka (1995) and continued in Dayal (2004) and Borik & Espinal (2012; 2015), which seeks to explicitly relate the syntax and semantics of kind-, subkind- and object-referring DPs.

Abbreviations

ACC	accusative case	NOM	nominative case
CL	classifier	PF	phonological form
COP	copula	PFV	perfective aspect
F	feminine gender	PL	plural number
GEN	genitive case	PRES	present tense
INST	instrumental case	SG	singular number
LOC	locative case	TOP	topic
M	masculine gender	REFL	reflexive

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Chapter 10

Maximal interpretation and definiteness of nominal phrases in Russian: Implication for the NP/DP parameter

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The aim of this paper is to demonstrate that the maximal (exhaustive) interpretation of nominal phrases cannot be used to support the existence of determiner phrases in Russian. The paper argues that the maximal interpretation of phrases including numerals and possessives arises irrespective of the syntactic position of the possessors. Rather, it should be dealt with as a merely semantic matter and the difference between the maximal and non-maximal interpretations can be reduced to (in)definiteness.

Keywords: Russian, maximal interpretation, definiteness, DP hypothesis, numeral, possessive

1 Introduction

The literature on the structure of Slavic nominal phrases without overt articles splits into two standpoints. Some researchers insist on the presence of determiner phrases (DPs) even in articleless Slavic languages (UNIVERSAL DP HYPOTHESIS; see, e.g., [Progovac 1998](#); [Rappaport 2002](#); [Rutkowski 2002](#); [Bašić 2004](#); [Franks & Pereltsvaig 2004](#); [Pereltsvaig 2007](#); [Rutkowski & Maliszewska 2007](#)). Others maintain that nominal phrases in Slavic are NPs (PARAMETERIZED DP HYPOTHESIS; e.g., [Zlatić 1998](#); [Trenkic 2004](#); [Bošković 2005](#); [2007](#); [2009](#); [Despić 2013](#)). [Kagan & Pereltsvaig \(2012\)](#) contributed to the investigation of this matter by considering some behaviors of adjectival modifiers. They conclude that the DP layer exists even in articleless Russian.



The aim of the present paper is to demonstrate that a maximal (exhaustive) interpretation of nominal phrases cannot be used to support the claim that there is a DP projection in Russian. Contrary to Kagan & Pereltsvaig (2012), I claim that a maximal interpretation of phrases including numerals and possessors arises independently of the high syntactic position of the possessor, since it is also available with possessors in a low syntactic position. The maximal interpretation should thus be dealt with as a merely semantic matter. It follows that the difference between maximal and non-maximal interpretations can be reduced to an opposition of definiteness versus indefiniteness.

The paper is organized as follows: §2 provides some data regarding a maximal interpretation in Russian nominal phrases with a focus on prenominal and post-nominal possessors. In addition, I outline the discussion of Kagan & Pereltsvaig (2012) in terms of a maximal interpretation. §3 presents my hypothesis that the maximal interpretation can be reduced to simple definiteness on the basis of the semantics of definiteness. §4 and §5 verify the validity of the hypothesis by using the definiteness effect and the genitive of negation. §6 concludes the paper.

2 Russian possessors and their interpretation

2.1 Prenominal possessors

In Russian, adjectival modifiers such as possessive adjectives (like *Dimin* ‘Dima’s’, *Mašin* ‘Masha’s’) can precede or follow numerals as shown in (1) and (2).¹

- (1) a. *pjat’ Diminyx knig*
 five Dima.GEN.PL book.GEN.PL
 ‘five of Dima’s books’
 b. *Diminy pjat’ knig*
 Dima.NOM.PL five book.GEN.PL
 ‘Dima’s five books’ (Kagan & Pereltsvaig 2012: 173)
- (2) a. *devjat’ Mašinyx sumok*
 nine Masha.GEN.PL bag.GEN.PL
 ‘nine of Masha’s bags’

¹In this paper, the focus is on possessives. In fact, some other adjectival modifiers seem to behave almost the same way as possessive adjectives in terms of word order (see §2.2). However, further research is necessary to draw conclusions about the correlation between syntactic positions of other adjectives and the rise of a maximal interpretation.

- b. *Mašiny devjat' sumok*
 Masha.NOM.PL nine bag.GEN.PL
 'Masha's nine bags'

The phrases (1a) and (2a), where the possessive adjectives follow the numerals, are not interpreted maximally: Dima may have more than five books, and Masha may have more than nine bags. These phrases show the unmarked word order, thus possessives in Russian are usually considered non-exhaustive (see, e.g., Par-tee 2006). However, Kagan & Pereltsvaig (2012) point out that the alternative order is possible where a possessive adjective precedes a numeral. For example, the phrases (1b) and (2b) are grammatical. Unlike (1a) and (2a), the phrases in (1b) and (2b) receive a maximal interpretation and presuppose that Dima has exactly five books and Masha has exactly nine bags, respectively.

The difference in interpretation is reflected in the contrast between (3a), (4a) and (3b), (4b), respectively.

- (3) a. * *vse pjat' Diminyx knig*
 all.NOM.PL five Dima.GEN.PL book.GEN.PL
 Intended: 'all five of Dima's books'
- b. *vse Diminy pjat' knig*
 all.NOM.PL Dima.NOM.PL five book.GEN.PL
 'all Dima's five books'
- (4) a. * *vse devjat' Mašinyx sumok*
 all.NOM.PL nine Masha.GEN.PL bag.GEN.PL
 Intended: 'all nine of Masha's bags'
- b. *vse Mašiny devjat' sumok*
 all.NOM.PL Masha.NOM.PL nine bag.GEN.PL
 'all Masha's nine bags'

The universal quantifier *ves'* 'all' compels the maximal interpretation because of its lexical meaning. Therefore, it can be added to (1b) and (2b), which receive the maximal interpretation without semantic contradiction as shown in (3b) and (4b). However, it cannot be added to (1a) or (2a), which do not receive a maximal interpretation because of semantic contradiction as shown in (3a) and (4a).

The above-mentioned statements regarding possessive adjectives also apply to possessive pronouns (e.g. *naš* 'our', *voj* 'your') as shown in (5) and (6).

- (5) a. (*vse) *pjat' našix knig*
 all five our.GEN.PL book.GEN.PL
 'five of our books'
- b. (vse) *naši pjat' knig*
 all our.NOM.PL five books.GEN.PL
 '(all) our five books'
- (6) a. (*vse) *devjat' tvoix sumok*
 all nine your.GEN.PL bag.GEN.PL
 'nine of your bags'
- b. (vse) *tvoi devjat' sumok*
 all your.NOM.PL nine bag.GEN.PL
 '(all) your nine bags'

Possessive pronouns can follow the numerals as in (5a) and (6a), but can also precede them as in (5b) and (6b), which is fully parallel to possessive adjectives as shown in (1) and (2) above. Also regarding interpretation, possessive pronouns behave similarly to possessive adjectives. The phrases in (5a) and (6a) are interpreted non-maximally: The speakers or the addressee may have more than five books or nine bags, respectively. On the other hand, the phrases in (5b) and (6b) show a maximal interpretation: The relevant persons possess exactly five books or nine bags, respectively.

2.2 Maximal interpretation and syntactic structure of nominals

Kagan & Pereltsvaig (2012) state that a maximal interpretation as in (1b) and (2b) is due to the fact that the possessive adjective appears in a high position and that there is a projection responsible for maximality. Generally, authors associate exhaustive interpretation with the projection of a DP (e.g., Zamparelli 2000).² Therefore, Kagan & Pereltsvaig conclude that there is a DP layer in Russian, since

²Kagan & Pereltsvaig (2012) do not provide a detailed explanation of how to realize a maximal interpretation in nominal phrases, except that they claim that it results from a high syntactic position of the possessor. However, maximal interpretation is related to definiteness (see §3), if we take into consideration that DP is the projection of definiteness (see Lyons 1999) and that Kagan & Pereltsvaig connect maximal interpretation with DP. In addition, Koev (2011) claims that definiteness in Bulgarian is realized through a slightly modified version of Agree, based on Baker (2008). Thus, at this stage it is natural to assume that maximal interpretations in Russian are also realized through Agree.

the high position in which a possessive adjective can appear is located in the DP field. That position is the highest AP (in α P-1) in Figure 1.

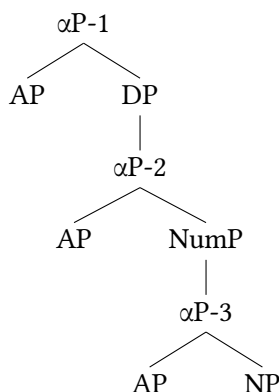


Figure 1: Sketch of the structure of nominal phrases in Russian (Kagan & Pereltsvaig 2012: 168)

According to Kagan & Pereltsvaig (2012: 168), high adjectives that appear in α P-1 modify the referent of DP, intermediate adjectives in α P-2 modify the quantity denoted by NumP, and low adjectives in α P-3 modify the property of NP.

In particular, the high projection in α P-1 hosts adjectives such as *poslednij* ‘last’, *pervyj* ‘first’, *sledujuščij* ‘next’, *takoj* ‘such’, *opredelënnij* ‘certain’, and adjectival elements like demonstratives (e.g., *ëtot* ‘this’), indefinite pronouns (e.g., *kakoj-to* ‘some’), and possessives (e.g., *moj* ‘my’). The intermediate adjectives that can appear in α P-2 include *dobryj* ‘good’, *celyj* ‘whole’, *dolgij* ‘long’, *kakoj-nibud* ‘some; any’, *nepolnij* ‘incomplete’, and so on. The difference between the high and intermediate adjectives is found in the contrast between cases of adjectives in (7) and (8).

- (7) a. *poslednie pjat’ knig*
 last.NOM.PL five books.GEN
 ‘the last five books’
 b. *kakie-to desjat’ podroستkov*
 some.NOM.PL ten teenagers.GEN
 ‘some (unknown) ten teenagers’ (Kagan & Pereltsvaig 2012: 169)
- (8) a. *celyx tridcat’ svobodnyx dnej*
 whole.GEN.PL thirty free.GEN.PL days.GEN.PL
 ‘a whole thirty free days’ (Babby 1987: 121)

- b. *dobryx desjat' kilometrov*
 good.GEN.PL ten kilometers.GEN.PL
 'a good ten kilometers' (Kagan & Pereltsvaig 2012: 175)

In (7), the adjectives precede the numerals, and they appear in nominative case. On the other hand, in (8), the adjectives appear in genitive case, although they precede the numerals just like the adjectives in (7) do.

The low adjectives in α P-3 follow the numerals and appear in genitive case.³

- (9) a. *pjat' umnyx mal'čikov*
 five clever.GEN.PL boys.GEN.PL
 'five clever boys'
 b. *desjat' bol'six gorodov*
 ten big.GEN.PL cities.GEN.PL
 'ten big cities' (Kagan & Pereltsvaig 2012: 169)

2.3 Postnominal possessors

Kagan & Pereltsvaig's (2012) argument introduced in §2.2 seems to be valid. The maximal interpretation, however, should not be considered a result of the high syntactic position of the possessor, since it is also available in a phrase where a noun in genitive case following a head noun is used as a possessor.

Adnominal genitives are usually supposed to be located in a lower position than their head nouns (see, e.g., Franks 1995: 38; Bailyn 2012: 214; Mitrenina et al. 2012: 84), which is shown in Figure 2.⁴

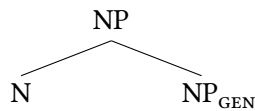


Figure 2: The structure of nominal phrases including adnominal genitives in Russian

³For more details, see Kagan & Pereltsvaig (2012).

⁴To be precise, Bailyn (2012) does not propose the structure in Figure 2. According to him, adnominal genitives occupy the complement position in a QP as shown in (i):

(i) [_{NP} N [_{QP} Q NP_{GEN}]] (Bailyn 2012: 214; slightly modified)

Bailyn (2012: 214) proposes that Q assigns genitive case to its sister NP (there is case where Q is covert). These differences in the positioning of the genitive NP have no effect on the argument of this paper, since a genitive possessor NP is located lower than a possessee NP.

The phrases in (10) show this type of configuration.⁵

- (10) a. *pjat' knig* *Dimy*
 five books.GEN.PL Dima.GEN
 'Dima's five books/five of Dima's books'
- b. *devjat' sumok* *Maši*
 nine bag.GEN.PL Masha.GEN
 'Masha's nine bags/nine of Masha's bags'

The phrases in (10) can be interpreted either maximally or non-maximally. In other words, they can be paraphrased with both (1a)/(2a) and (1b)/(2b), respectively. In addition, it is possible to add the universal quantifier *ves'* 'all', which coerces the maximal interpretation.

- (11) a. *vse* *pjat' knig* *Dimy*
 all.NOM.PL five books.GEN.PL Dima.GEN
 'all Dima's five books'
- b. *vse* *devjat' sumok* *Maši*
 all.NOM.PL nine bag.GEN.PL Masha.GEN
 'all Masha's nine bags'

As illustrated in (11), the quantifier *ves'* 'all' and each of the phrases in (10) can co-occur without any problems. This indicates that the maximal interpretation can be obtained when the possessors are located in a low position.

The availability of the maximal interpretation in (10) and (11), which have the possessors in a low position, suggests that it is not necessary to relate the interpretation to a high syntactic position of the possessors. In other words, maximal/

⁵In Russian, a possessive adjective is derived from a noun (e.g., *Dima* > *Dimin* 'Dima's'). Therefore, the nominal phrases including possessive adjectives such as (1) and (2) can be paraphrased by locating the genitive possessors after the heads like in (10) (see Švedova 1980). On the other hand, possessive pronouns (e.g., *naš* 'our', *tvoj* 'your') cannot be paraphrased by using corresponding personal pronouns as postnominal genitive possessors; see (i).

- (i) a. **pjat' knig* *nas*
 five book.GEN.PL US.GEN
 Intended: 'our five books/five of our books'
- b. **devjat' sumok* *tebja*
 nine bag.GEN.PL YOU.GEN
 Intended: 'your nine bags/nine of your bags'

non-maximal interpretations are not related to syntax and should be analyzed as a matter of semantics.

In the next section, following Heim (2011), I show the limit of classical semantic analyses of definiteness and their extension by Sharvy (1980). In addition, I present a hypothesis based on the discussion of this section.

3 Hypothesis

The maximal interpretation cannot be yielded by the classical semantics of definiteness in Frege (1892 = 1980) or Russell (1905), respectively, both shown in (12).

- (12) a. Fregean definite:

$$\llbracket \text{the} \rrbracket = \lambda P : \exists x. \forall y [P(y) \leftrightarrow x = y]. \lambda Q. \exists x [P(x) \wedge Q(x)]$$
b. Russellian definite:

$$\llbracket \text{the} \rrbracket = \lambda P. \lambda Q. \exists x [\forall y [P(y) \leftrightarrow x = y] \wedge Q(x)]$$

These denotations can correctly capture the meaning of the sentence in (13).

- (13) The book arrived.

However, the coverage of the Russellian and Fregean analyses is limited to singular count nouns only. The denotations of definites in (12) are not enough to capture the presupposition of maximality in (14).

- (14) The books arrived.

The maximal interpretation of (14) can be obtained by using the semantics of definiteness presented in (15), as Sharvy (1980) does, which invokes maximality.

- (15) a. $\llbracket \text{DEF} \rrbracket = \lambda P : \exists x. \forall y [\text{MAX}(P)(y) \leftrightarrow x = y]. \lambda x. \text{MAX}(P)(x)$
b. $\text{MAX}(P) := \lambda x. P(x) \wedge \neg \exists y [P(y) \wedge x < y]$

Denotation (15a) leads to the interpretation of the presupposition in (14) that all the books arrived. That is, it presupposes that if three books are intended, not one or two but all three books arrived. In this case, it picks out only a maximal plurality as a singleton ($a \oplus b \oplus c$, each atom of which is a book, in the diagram in Figure 3) by the function of the MAX operator, defined in (15b).

In the same way as mentioned above, denotation (15a) gives rise to maximal interpretation. For example, the denotation can introduce the interpretation in

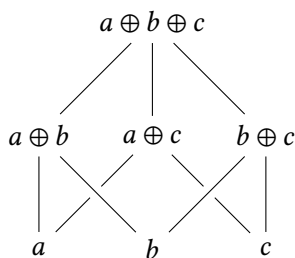


Figure 3: Semi-lattice structure

(1b) that Dima has exactly five books ($'a \oplus b \oplus c \oplus d \oplus e'$, each atom of which is a book in this case) because of MAX.

As a result of the discussion presented so far, I hypothesize that the contrast in interpretations between (1a)/(2a) and (1b)/(2b) can be reduced to the simple difference in definiteness without any relation to the syntactic position of the possessors.

In §4 and §5, I show that the hypothesis presented in this section is valid through tests using the definiteness effect and the genitive of negation as diagnostics.

4 Test 1: The definiteness effect

4.1 The definiteness effect

Restrictions regarding the syntactic distribution of definites and indefinites are termed the DEFINITENESS EFFECT (DE; also known as definiteness restriction). DE can be observed in a number of constructions in various languages.

Thus, for instance, subjects of English existential *there*-sentences are known to be limited to indefinite nouns as shown in (16).

- (16) a. There was a table in the garden.
 b. * There was the table in the garden.

In Icelandic, direct objects can be shifted before negative markers in some cases. As (17) and (18) illustrate, the definite direct object undergoes object shift but the indefinite one does not.

- (17) a. *Jón las ekki [bækurnar].*
 John read NEG books.DEF

- b. *Jón las [bækurnar] ekki.*
 John read books.DEF NEG
 ‘John did not read the books.’ (Icelandic; Collins & Thráinsson 1996: 392)
- (18) a. *Hann las ekki [bækur].*
 he read NEG books
 b. **Hann las [bækur] ekki.*
 he read books NEG
 ‘He didn’t read books.’ (Icelandic; Ritter & Rosen 2005: 24)

In Hebrew, only the definite direct object is overtly marked for accusative case, whereas the indefinite one is not; see (19).

- (19) a. *ani karati et ha-sefer.*
 I read ACC DEF-book
 ‘I read the book.’
 b. *ani karati (*et) sefer.*
 I read ACC book
 ‘I read a book.’ (Hebrew; Ritter & Rosen 2005: 24)

4.2 DE in Russian

Paducheva (2000) points out that a DE similar to English also exists in Russian existential constructions; cf. the sentences in (20) and (21), respectively.

- (20) a. There is a pig in the garden.
 b. There were three sailors standing on the corner.
 c. There are many solutions to this problem.
 d. ? There is every tiger in the garden.
 e. ? There were most students in the hall.
 f. ? There are all solutions to this problem. (Bach 1989: 58)
- (21) a. *V ogorode svinja. / V ogorode est’ svinja.*
 in garden.LOC pig.NOM.SG in garden.LOC is pig.NOM.SG
 ‘There is a pig in the garden.’

- b. *Na uglu stojat tri matrosa.*
on corner.LOC stand [three sailors].NOM
'There are three sailors standing on the corner.'
- c. *{Est' / Suščestvuet} mnogo rešenij ètoj problemy.*
is exists [many solutions].NOM [this problem].GEN.SG
'There are many solutions to this problem.'
- d. * *V sadu est' každyj tigr.*
in garden.LOC is [every tiger].NOM.SG
Intended: 'There is every tiger in the garden.'
- e. * *V auditorii bylo bol'sinstvo studentov.*
in hall.LOC was majority.NOM.SG student.GEN.PL
Intended: 'There were most students in the lecture hall.'
- f. * *{Est' / Suščestvujut} vse rešenija ètoj problemy.*
are exist [all solution].NOM.PL [this problem].GEN.SG
Intended: 'There are all solutions to this problem.'

(Paducheva 2000: 134)

The Russian sentences in (21) are grammatical if the corresponding English sentences in (20) are also grammatical as is shown in (20a)–(20c) and (21a)–(21c), respectively. Likewise, Russian sentences are ungrammatical if the corresponding English sentences display low acceptability as in (20d)–(20f) and (21d)–(21f), respectively. The Russian translations preserve the (un)grammaticality in their English counterparts regarding DE in existential constructions.⁶

⁶There are some differences regarding DE between English and Russian as shown in (i) and (ii).

- (i) a. * There wasn't John at the party.
b. * There weren't John's ten students at the party. (Keenan 1996: 69)
- (ii) a. *Na večere ne bylo Džona.*
at party.LOC NEG was John.GEN
'John wasn't at the party.'
b. *Na večere ne prisutstvovali vse desjat' aspirantov Džona.*
at party.LOC NEG were.present [all ten graduate.student].NOM John.GEN
'Not all John's ten students were at the party.'

(Paducheva 2000: 134–135)

The ungrammaticality in the English sentences in (i) is not preserved in their Russian translations in (ii). Paducheva (2000) attributes the difference in grammaticality to lexical differences between the existential verb *byť* in Russian and *to be* in English. It should be noted that these are negated sentences.

4.3 Test by DE

The Russian DE in the existential construction can be used as a test to verify validity of my hypothesis that the contrast in interpretations between (1a), (2a) and (1b), (2b) can be reduced to the difference in definiteness.

Phrases without maximal interpretation like (1a) and (2a) can occur in the existential construction without any problem as demonstrated in (22a) and (23a), whereas phrases with maximal interpretation like (1b) and (2b) are semantically odd as shown in (22b) and (23b).

(22) (1a) and (1b) in the existential construction

- a. *V knižnom škafu est' pjat' Diminyx knig.*
in bookshelf.LOC are five Dima's.GEN.PL book.GEN.PL
'There are five of Dima's books in the bookshelf.'
- b. # *V knižnom škafu est' Diminy pjat' knig*
in bookshelf.LOC are Dima's.NOM.PL five book.GEN.PL
'There are Dima's five books in the bookshelf.'

(23) (2a) and (2b) in the existential construction

- a. *Na polu est' devjat' Mašinyx sumok.*
on floor.LOC are nine Masha's.GEN.PL bag.GEN.PL
'There are nine bags of Masha's on the floor.'
- b. # *Na polu est' Mašiny devjat' sumok*
on floor.LOC are Masha's.NOM.PL nine bag.GEN.PL
'There are Masha's nine bags on the floor.'

The (un)acceptability of the sentences in (22) and (23) is indicative that what lies behind the semantic oddity of (1b) and (2b) is the fact that definite NPs are in general excluded from the existential construction both in Russian and English. Accordingly, (1b) and (2b) are definite, while (1a) and (2a) are indefinite.

Note, moreover, that phrases with adnominal genitives as possessors as in (10) can be interpreted either maximally or non-maximally, which is why they can occur in the existential construction as demonstrated in (24).

(24) (10) in the existential construction

- a. *V knižnom škafu est' pjat' knig Dimy.*
in bookshelf.LOC are five book.GEN.PL Dima.GEN
'There are five of Dima's books in the bookshelf.'

- b. *Na polu est' devjat' sumok Maši.*
on floor.LOC are nine bag.GEN.PL Masha.GEN
'There are nine bags of Masha's on the floor.'

I claim that both *pjat' knig Dimy* and *devjat' sumok Maši* have to be interpreted non-maximally in order to avoid semantic oddity.

5 Test 2: The genitive of negation

5.1 The genitive of negation

The genitive of negation (GN), which is available in several Slavic languages, is a phenomenon where an argument is marked with generative case under sentential negation although the argument is marked with the nominative or accusative case in a corresponding affirmative sentence.⁷

While the case alternation between nominative and genitive occurs on subjects of unaccusative verbs as shown in (25),⁸ the alternation between accusative and genitive case occurs on direct objects of transitive verbs as shown in (26).⁹

- (25) a. *Pis'mo ne prišlo.*
letter.NOM NEG came
'The letter did not come.'
- b. *Pis'ma ne prišlo.*
letter.GEN NEG came
'A letter did not come. (No letter came.)' (Apresjan 1985: 292)
- c. *{Pis'mo / *Pis'ma} prišlo.*
letter.NOM letter.GEN came
'A/The letter came.'

⁷Sometimes not only arguments but also adjuncts bear genitive case due to GN. For the sake of simplicity, this paper addresses GN on verbal arguments only.

⁸In addition to subjects of unaccusatives, GN can also appear on subjects of passive predicates under sentential negation.

⁹Some researchers (e.g., Peškovskij 1956; Pesetsky 1982; Franks 1995; Borovikoff 1997; Szucsich 2001; Bailyn 2012) point out that the case alternation can occur on specific accusative nominal adverbials. However, there is debate about whether the genitive case on this type of adjuncts is an instance of the partitive genitive (see Franks & Dziwirek 1993) rather than the GN (see Borovikoff 1997; Pereltsvaig 2000).

- (26) a. *Anna ne kupila žurnal.*
 Anna.NOM NEG bought magazine.ACC
 ‘Anna did not buy the magazine.’
 b. *Anna ne kupila žurnala.*
 Anna.NOM NEG bought magazine.GEN
 ‘Anna did not buy a magazine.’
 c. *Anna kupila {žurnal / *žurnala}.*
 Anna.NOM bought magazine.ACC magazine.GEN
 ‘Anna bought a/the magazine.’ (Harves 2002: 647)

The nominative-case subject in (25a) can be altered with the genitive-case subject in (25b) under sentential negation. In the same way, the accusative-case direct object in (26a) can be exchanged with the genitive-case object in (26b). Crucially, these alternations do not occur in affirmative sentences.

Many syntactic and semantic (and sometimes stylistic) factors affect the choice between genitive and nominative/accusative. What is significant for this paper is that genitive arguments are generally interpreted as indefinite/non-specific, while accusative arguments tend to be interpreted as definite/specific (see, a.o., Timberlake 1975; Harves 2002; Kim 2003; Partee & Borshev 2004; Kagan 2012; Harves 2013).

5.2 Test by GN

In order to verify the validity of my hypothesis that the contrast in interpretation between non-maximal (1a)/(2a) and maximal (1b)/(2b) can be reduced to the differences in definiteness, GN can be used as a test in the same way as DE, since GN is likewise sensitive to definiteness.¹⁰

Phrases with a non-maximal interpretation like (1a) and (2a) readily occur in GN environments as demonstrated in (27a) and (28a), respectively. On the other hand, phrases with a maximal interpretation like (1b) and (2b) result in semantic oddity as illustrated in (27b) and (28b), respectively.

- (27) (1a) and (1b) in the environment of GN
 a. *Ivan ne čital pjati Diminyx knig.*
 Ivan.NOM NEG read [five Dima’s books].GEN

¹⁰It is certain that the determinant of GN cannot be reduced to definiteness even if the focus is limited to the case alternation between genitive and accusative on direct objects. See, among many others, Timberlake (1975), Kagan (2012), and Geist 2015 for the discussion of possible alternative and additional factors.

- b. # *Ivan ne čital Diminyx pjati knig.*
 Ivan.NOM NEG read [Dima's five books].GEN
 'Ivan did not read five of Dima's books.'

(28) (2a) and (2b) in the environment of GN

- a. *Ja ne bral devjati Mašinyx sumok.*
 I.NOM NEG took [nine Masha's bags].GEN
 b. # *Ja ne bral Mašinyx devjati sumok.*
 I.NOM NEG took [Masha's nine bags].GEN
 'I did not take nine of Masha's bags.'

Moreover, the phrases interpreted non-maximally render the acceptability of the sentence lower if they occur as accusative objects under sentential negation as is shown in (29a) and (30a), respectively. In contrast, the phrases with a maximal interpretation are grammatical in the same environment; see (29b) and (30b).

(29) (1a) and (1b) as accusative objects in a negated environment

- a. ?? *Ivan ne čital pjat' Diminyx knig.*
 Ivan.NOM NEG read [five Dima's books].ACC
 b. *Ivan ne čital Diminy pjat' knig.*
 Ivan.NOM NEG read [Dima's five books].ACC
 'Ivan did not read Dima's five books.'

(30) (2a) and (2b) as accusative objects in a negated environment

- a. ?? *Ja ne bral devjat' Mašinyx sumok.*
 I.NOM NEG took [nine Masha's bags].ACC
 b. *Ja ne bral Mašiny devjat' sumok.*
 I.NOM NEG took [Masha's nine bags].ACC
 'I did not take Masha's nine bags.'

The facts shown in (27)–(30) suggest that the phrases in (1b) and (2b), which are interpreted maximally, are definite, while the phrases interpreted non-maximally in (1a) and (2a) are indefinite, since arguments in genitive case are interpreted as indefinite, while arguments in the accusative case are interpreted as definite.

6 Conclusion

I have provided some data regarding non-/maximal interpretation and demonstrated that the relevant interpretation of nominal phrases arises independently of the syntactic position of the possessor. That is, the maximal interpretation comes about not only through high possessors (possessive adjectives and pronouns) but also through low possessors (adnominal genitives). Therefore, the maximal interpretation of nominal phrases cannot be used as a diagnostic to support the existence of DP projections in Russian. In addition, I have shown that the contrast between the maximal and non-maximal interpretations can be reduced to the difference between definiteness and indefiniteness by means of the tests of definiteness effect and genitive of negation.

It goes without saying that there are many other issues left regarding definiteness and the syntactic structure of Russian nominal phrases. I believe, however, that the present paper makes a small contribution to the resolution of these issues.

Abbreviations

ACC	accusative case	LOC	locative case
DE	definiteness effect	NEG	negation
DEF	definite article	NOM	nominative case
GEN	genitive case	PL	plural
GN	genitive of negation	SG	singular

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Chapter 11

Perfective *dozapisyvat'* – real or fake?

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The paper discusses perfective verbs like *dozapisyvat'* or *dovyšivat'* in which, contrary to what current theories of Russian verb formation would have predicted, a positionally restricted prefix attaches above secondary imperfective morphology. In the first part of the paper it is shown that the phenomenon is real, and should not be denied or ignored. In the second part it is argued that the otherwise observed prohibition of positionally restricted prefixes over secondary imperfective suffixes is a case of pragmatic blocking. It is proposed that perfective verbs like *dozapisyvat'* are possible because in the specific case of *do-* the morphological blocking mechanism may be suspended under certain contextual circumstances, i.e. when reference is made to the final element within a sequence of completed events describable by the verb without this prefix.

Keywords: Russian, verb formation, aspect, imperfectivizing suffix, positionally restricted prefix, iterativity, morphological blocking

1 Introduction

The present paper contributes to a recent debate concerning the structure of the Russian verb. It addresses the question of whether the prefix *do-* in its “completive” usage may attach to a verbal base which already contains secondary imperfective morphology, giving rise to perfective forms like the one in the title of this article.

The background of the matter is the fine-grained analysis of Russian verbal morphology outlined in [Tatevosov \(2009\)](#) and [Tatevosov \(2013b\)](#). In these two articles, the author presents a detailed inventory of the Russian prefixes, which supersedes the well-known bipartition into internal/lexical and external/super-lexical prefixes (see [Gehrke 2008](#); [Ramchand 2004](#); [Romanova 2004](#); [Svenonius](#)



2004; among others). Relevant for the present paper is the proposed class of so-called POSITIONALLY RESTRICTED (PR-)prefixes, which has at least the three members noted below (see Tatevosov 2013b: 49):

- (1)
- external prefixes
 - left-peripheral prefixes
 - po*-distributive
 - selectionally restricted prefixes
 - za*-inchoative
 - po*-delimitative
 - ...
 - positionally restricted prefixes
 - do*-completive
 - pere*-repetitive
 - pod*-attenuative
 - internal prefixes
 - u*-
 - v(o)-*
 - nad(o)-*
 - ...

According to Tatevosov, PR-prefixes are free to apply to perfective or imperfective bases, but are fixed to a structural position lower than the secondary imperfective morpheme *yv(a)*. Thus, Tatevosov's theory entails the following generalization:

- (2) Generalization [**PR > yva*]
 Positionally restricted (external) prefixes must not apply above secondary imperfective morphology (*yva*).

Now Zinova & Filip (2015) and in particular Zinova (2016) have drawn attention to a class of verbs representing counterevidence to (2). Their paradigmatic examples are *dozapisyvat'* 'finish recording' and *dovyšivat'* 'finish embroidering'. According to Zinova & Filip (2015), these verbs are perfective when derived along the derivational histories in (3):

- (3)
- a. *pisat'*^{IPFV} → *zapisat'*^{PFV} → *zapisyvat'*^{IPFV} → *dozapisyvat'*^{PFV}
 - b. *šit'*^{IPFV} → *vyšit'*^{PFV} → *vyšivat'*^{IPFV} → *dovyšivat'*^{PFV}

If these assumptions are correct, *do*-^{completive} applies to a secondarily imperfectivized form in these cases, thus falsifying [$*PR > yva$]. The aim of this paper is to assess this conclusion by asking the following two questions.

- (4) [Q1] Is there really a perfective verb *dozapisyvat'*?
 [Q2] If yes, does it really falsify Tatevosov's theory?

Jumping ahead, I will answer the first question affirmatively and the second one negatively. There is something special about *do*- that makes it a systematic exception to the otherwise valid generalization (2).

The paper is structured as follows. In §2 I introduce the phenomenon: verbs like *dozapisyvat'* that allow for an expected imperfective, but also for an unexpected perfective reading. §3 points to four issues related to these verbs that until now have either not been asked or not been answered. Before introducing my own proposal, §4 is inserted to demonstrate the weaknesses of alternative explanations of the phenomenon that might come to mind. In §5 I outline my own analysis. I show that the prefix *do*- may attach to a base involving secondary imperfective morphology only if the base denotes a plurality of successively realizing completed events. I will explain why this is so and how this accounts for the open issues addressed in §3. §6 concludes the paper.

2 The biaspectual behavior of *dozapisyvat'*

Let me briefly recapitulate the properties of the class of verbs identified by *Zinova & Filip (2015)*. Following the authors' practise, I will use the verbs noted above as representatives of the whole class.

To begin with, *dozapisyvat'* and *dovyšivat'* are capable of expressing imperfective meanings:

- (5) *Ja dozapisyvaju pesnju uže 2 časa.*
 I finish.record.PRS.IPFV song already 2 hours
 'I am finishing recording the song already for 2 hours.' (*Zinova 2016: 16*)
- (6) *Vot v dannyj moment dozapisyvaju Alan Wake.*
 PRT in given moment finish.record.PRS.IPFV A.W.
 'At the very present moment I am finishing recording Alan Wake.'¹
 (www.x360-club.org/forum)

¹"Alan Wake" is a video game.

- (7) *Chorošen'kie! A ja kak raz dovyšivaju kotiki!!! Skoro*
 cute but I now finish.embroider.PRS.IPFV tomcats soon
pokažu!
 show-PRS.PFV
 'How cute! And I am right now finishing embroidering the tomcats!!! I
 will show them soon.' (www.chudokrestik.forum2x2.ru)

As examples (5) to (7) show, the relevant verbs may clearly be used as imperfectives. This does not come as a surprise. Apart from that usage, however, *dozapisyvat'* and *dovyšivat'* can arguably also express perfective meanings. The first evidence for this conclusion stems from compatibility with inclusive time adverbials. As shown in Zinova (2016: 16), such adverbials are strictly ruled out for verbs like *dopisyvat'* (8) but possible with verbs like *dozapisyvat'* (9) and *dovyšivat'* (10).

- (8) * *Ja dopisyvaju pesnju za 2 časa.*
 I finish.write.PRS.IPFV song within 2 hours
 Intended: 'I will finish writing the song in 2 hours.'
- (9) *Ja dozapisyvaju pesnju za 2 časa.*
 I finish.record.PRS.PFV song within 2 hours
 'I will finish recording the song in 2 hours.'
- (10) *Ja dovyšivaju kartinu za 2 časa.*
 I finish.embroider.PRS.PFV picture within 2 hours
 'I will finish embroidering the picture in 2 hours.'

Another indication of perfectivity is that verbs like *dozapisyvat'* can move the reference time forward in narratives.

- (11) *Ja dozapisyvaju disk i pojdu domoj.*
 I finish.record.PRS.PFV CD and go.PRS.PFV home
 'I will finish recording the CD and go home.' (Zinova 2016: 32)

The significance of this test is emphasized by the fact that a verb like *dopisyvat'* 'finish writing', which has external *do-* but no internal prefix, does not support narrative progression.

- (12) * *Ja dopisyvaju tekst i pojdu domoj.*
 I finish.write.PRS.IPFV text and go.PRS.PFV home
 Intended: 'I will finish writing the text and go home.' (Zinova 2016: 32)

The same pattern can be observed with respect to *dovyšivat'* and *došivat'* 'finish sewing':

- (13) *Ja dovyšivaju kartinu i pojdu domoj.*
 I finish.embroider.PRS.PFV picture and go.PRS.PFV home
 'I will finish embroidering the picture and go home.'

- (14) * *Ja došivaju plat'e i pojdu domoj.*
 I finish.sew.PRS.IPFV dress and go.PRS.PFV home
 Intended: 'I will finish sewing the dress and go home.'

(15) is an authentic example to show, once more, that *dovyšivat'* with present tense inflection (here: 1st person singular) can be used under future reference without further ado – as is characteristic of a perfective verb.²

- (15) *Kartina, za kotoruju ja vzjalas', monochromnaja, skučnovato*
 picture behind PRON I attend.to.PST.PFV monochrome boring
ee vyšivat' okazalos', no ja ee
 her embroider.INF.IPFV turn.out.PST.PFV but I her
dovyšivaju objazatel'no!
 finish.embroider.PRS.PFV unconditionally
 'The picture that I attended to is monochrome, embroidering it turned
 out to be boring, but I will definitely finish embroidering it.'
 (www.stranamasterov.ru/)

From observations like those presented above, Zinova & Filip (2015) conclude that verbs like *dozapisyvat'* come in two versions, one perfective and one imperfective, related to two different derivational histories (16). The version (16b) falsifies Tatevosov's generalization [**PR > yva*]:

- (16) a. [[do-[za-[pis-]^{IPFV}]^{PFV} yva-]^{IPFV}
 b. [do-[[za-[pis-]^{IPFV}]^{PFV} yva-]^{IPFV}]^{PFV}

² "Without further ado" is added here because also imperfective verbs may have future reference, but only if accompanied by expressions such as *zavtra* 'tomorrow' in *Zavtra ja idu v kino* 'Tomorrow I go to the cinema'. No such expression is present in (15). Thanks to an anonymous reviewer for pointing that out.

3 Four open questions

We saw that, according to Zinova & Filip (2015) and Zinova (2016), verbs such as *dozapisyvat'* and *dovyšivat'* may express not only imperfective, but also perfective meanings. The perfective verb *dozapisyvat'* derives from prefixing the imperfective *zapisyvat'* with *do-* in completive function. This violates the constraint [$*PR > yva$], thus falsifying Tatevosov's (2013b) theory. Straightforward as this conclusion is, a number of issues arises from this proposal. There are at least four open questions.

3.1 No blocking?

Why is perfective *dozapisyvat'* not blocked by the availability of perfective *dozapisat'*? Wouldn't we expect the pragmatic principle 'avoid complexity of expression' (Kiparsky 2005), here stated in the version of Le Bruyn (2007), to rule out the morphologically more complex perfective verb *dozapisyvat'*?

(17) Avoid complexity principle

All other things being equal, less complex expressions are preferred over more complex expressions.

Take (11) from above, for instance. Why is the possibility of perfective *dozapisyvaju* not blocked by the existence of perfective *dozapišu*? The constructed example (18) makes the same point, involving a different verb: why is perfective *doustanavlivaju*, which is acceptable in this context, not blocked by perfective *doustanovlju*?³

- (18) *Ja doustanavlivaju Windows i pojdu domoj.*
 I finish.install.PRS.PFV W. and go.PRS.PFV home
 'I will finish installing Windows and go home.'

3.2 Constraints on coordination order?

Next, consider the following two examples.

- (19) *Mechanik dozapravljal samolet i zakuril sigaretu.*
 mechanic finish.fill.PST.PFV plane and start.smoke.PST.PFV cigarette
 'The mechanic finished fueling the plane and lightened a cigarette.'
(Zinova 2016: 175)

³Some of my informants have stylistic concerns about *doustanavlivat'*.

- (20) ?? *Mechanik zakuril sigaretu i dozapravljal*
 mechanic start.smoke.PST.PFV cigarette and finish.fuel.PST.PFV
samolet.
 plane
 Intended: 'The mechanic lightened a cigarette and finished fueling the plane.'

It can be observed that (20) is worse than (19). But why should that be so? Given that the form *dozapravljal* may serve as a perfective verb, as Zinova & Filip (2015) and Zinova (2016) suggest, there is no *prima facie* reason why switching the elements of the event chain in (19) should lower acceptability. Note that if we replace *dozapravljal* by its perfective rival *dozapravil*, the discourse will be sound again.

- (21) *Mechanik zakuril sigaretu i dozapravil samolet.*
 mechanic start.smoke.PST.PFV cigarette and finish.fuel.PST.PFV plane
 'The mechanic lightened a cigarette and finished fueling the plane.'

3.3 What about other PR-prefixes?

How do we explain that *do-* seems to be the only PR-prefix that can perfectivize secondary imperfectives? Indeed, *pere-* in repetitive function as well as *pod-* in attenuative function do not seem to allow for this option:

- (22) * *Ja perezapisyvaju disk i pojdu domoj.*
 I again.record.PRS.PFV disc and go.PRS.PFV home
 Intended: 'I will record the disc again and go home.'

- (23) * *Ja podzarabatyvaju den'gi i pojdu domoj.*
 I a.bit.earn.PRS.PFV money and go.PRS.PFV home
 Intended: 'I will earn a little money and go home.'

Zinova & Filip (2015) are well aware of the fact that the form *perezapisyvat'* is always imperfective. They conclude that *pere-*, unlike *do-*, yields an imperfective verb when built along a derivational chain analogous to (16b), and call this an "intriguing exception to the general pattern according to which the output of prefixation is perfective" (Zinova & Filip 2015: 605). If correct, that would indeed be an "intriguing exception" because it would run against common wisdom in Russian aspectology:

V sovremennom ruskom jazyke dejstvuet sledujuščij zakon: ljuboj glagol, polučennyj prisoedineniem pristavki k nekomu drugomu glagolu (i ne podvergijsja dal'nejšej imperfektivacii), javljaetsja glagolom sov. vida.

(Zaliznjak & Šmelev 1997: 67)

[In modern Russian there is the following law: any verb resulting from the attachment of a prefix to some other verb (and which is not subjected to further imperfectivization thereafter) is a perfective verb.]

3.4 What makes a good example?

Why are some forms instantiating the pattern *do+PREF+ROOT+yva+t'* much better as perfectives than others? Perfective *dovyšivat'* is accepted by almost any speaker of Russian; perfective *dozapisyvat'* is accepted by many, though by far not by all (see Zinova 2016: 16–17).

Thus (24) and (25) are fine for every native speaker of Russian I consulted, whereas (26) raises disagreement.⁴ What is missing is an explanation of this asymmetry in acceptability within the respective class of verbs.

- (24) *Ja dovyšiyvaju kartinu i pojdu domoj.*
I finish.embroider.PRS.PFV picture and go.PRS.PFV home
'I will finish embroidering the picture and go home.'

- (25) *Ja doustanavlivaju Windows i pojdu domoj.*
I finish.install.PRS.PFV W. and go.PRS.PFV home
'I will finish installing Windows and go home.'

- (26) *Ja dozapisyvaju pesnju i pojdu domoj.*
I finish.record.PRS.PFV song and go.PRS.PFV home
'I will finish recording the song and go home.'

In this section, I have pointed to four questions that await being answered given the way Zinova & Filip (2015) analyze the biaspectual behavior of verbs like *dozapisyvat'*. In the next section, I will pursue possible alternative treatments of the phenomenon.

⁴But see fn. 3.

4 Exploring alternative explanations

4.1 Fake perfectives

This subsection addresses question [Q1] in (4) by checking for the possibility that the perfectivity of *dozapisyvat'* (and its counterparts) is actually a mirage.

In view of the empirical evidence presented above, isn't it totally absurd to raise such a hypothesis? Maybe yes, but note that imperfective coding does not *per se* rule out a verb from the first sentence in a chain-of-events, i.e. from a discourse where the event denoted by the first sentence is related to the event of the second sentence via narration (Zinova 2016: 31). The prerequisite for this possibility is that the second sentence is introduced by the connective *potom* 'then':

- (27) *Ja zavtrakaju, potom pojdu na rabotu.*
 I have.breakfast.PRS.IPFV then go.PRS.PFV on work
 'I am eating breakfast, afterwards I will go to work.'

With respect to *dozapisyvat'*, the idea would be that *do-* explicitly marks the first event in (28) as finalizing a discourse constituent (inviting the inference of an implicit *potom*, so to speak), just like explicit *potom* marks the second event in (27) as starting a new discourse constituent.

- (28) *Ja dozapisyvaju disk i pojdu domoj.*
 I finish.record.PRS.IPFV disc and go.PRS.PFV home
 'I am finishing recording the disc, afterwards I will go home.'

A story along these lines could explain why the PR-prefixes *pere-* and *pod-* are not capable of forming perfective verbs when attaching to *zapisyvat'* or *vyšivat'*. But it cannot explain why (29) is bad:

- (29) **Ja došivaju plat'e i pojdu domoj.*
 I finish.sew.PRS.IPFV dress and go.PRS.PFV home
 Intended: 'I am finishing sewing the dress, afterwards I will go home.'

An argument in favor of the hypothesis that *dozapisyvat'* is always imperfective might be drawn from the observation that (30) displays no pluperfect reading.⁵

⁵The sentences (30) to (32) all allow for an imperfective interpretation according to which the agent of the subordinate clause came when Ivan was already engaged in finishing recording the discs, embroidering the picture, or installing Windows.

- (30) *Kogda načal'nik prišel k Ivanu, tot uže dozapisyval trebuemye diski.*
 when boss come.PST.PFV to I. DEM already finish.record.PST.PFV demanded discs
 Not: 'When the boss came to Ivan, he (Ivan) had already finished recording the demanded discs.'

But maybe in this case the perfective construal of *dozapisyval* is blocked by *dozapisal*. Indeed, with *dovyšivat'*, for which there is no shorter perfective alternative (the form **dovyšit'* does not exist in Russian), the pluperfect reading seems available:

- (31) *Kogda ja prišel k Ivanu, tot uže dovyšival kartinu.*
 when I come.PST.PFV to I. DEM already finish.embroider.PST.PFV picture
 Possible: 'When I came to Ivan, he (Ivan) had already finished embroidering the picture.'

Now note that also for *doustanavlivat'*, which does have a morphologically simpler perfective correlate in *doustanovit'*, the pluperfect reading is available. Concluding from (30) that *dozapisyvat'* cannot be perfective is thus premature.

- (32) *Kogda ja prišel k Ivanu, tot uže doustanavlivail Windows.*
 when I come.PST.PFV to I. DEM already finish.install.PST.PFV W.
 Possible: 'When I came to Ivan, he (Ivan) had already finished installing Windows.'

In view of the facts discussed in this section, the idea that the perfective behavior of verbs like *dozapisyvat'*, *dovyšiyvat'*, *doustanavlivat'*, etc. could be only apparent must be abandoned. Perfective *dozapisyvat'* is real.

4.2 Internal iterative *yva*

Now I will pursue the hypothesis that there really is a perfective version of *dozapisyvat'*, but that in this version the suffix *yv(a)* is no secondary imperfective morpheme, but rather an iterativizer. There are two ways in which this idea may

be implemented: suffixation may take place before or after prefixation. The second option will be addressed in §4.3. According to the first option, where *yv(a)* attaches low, suffixation serves to form an iterative stem from a simple root, i.e. *pisyv(at')* from *pis(at')* (see Padučeva 2015). When a lexical/internal prefix (here: *za-*) applies to such an iterative base (here: *pisyva-*), it will modify the event kind that is claimed to be realized repeatedly. In the given case this will lead from denoting multiple realizations of writing events to denoting multiple realizations of recording events. As for the external prefix *do-*, we assume, for the sake of the argument, that when stacking on top, it induces an upper closed “temporal macro event scale”, as indicated in Figure 1 (more on that below). The natural numbers indicate the number of events (in our case: recording events) that have occurred up to the respective point of time on the scale. The scale is upper-closed in that there is one point that demarcates the maximal number of events. In Figure 1 the maximal number of events is arbitrarily chosen as ten. Note further that the ten recording events symbolized in Figure 1 are ten maximal/completed recording events (the prefix *za-* introduces the respective maximality condition; see §5.1).

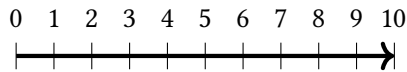


Figure 1: Upper closed macro event scale

Let us assume further that, unlike *do*-^{completive}, the prefixes *pere*-^{repetitive} and *pod*-^{attenuative} do not have the capacity of ordering the plurality of events in its input on a macro scale like Figure 1.

According to the story just sketched, the suffix *yv(a)* in perfective *dozapisyvat'* applies prior to the internal prefix *za-*, i.e. itself VP-internally. It is thus a different creature than the secondary imperfective *yv(a)* that figures in the constraint that Tatevosov identifies for PR-prefixes, which I repeat from above, this time in a direct quote from Tatevosov (2013b: 4):

(33) [**PR > yva*]

Pozicionno-ograničennye prefiksy prisoedinjajutsja ne vyše, čem pokazatel' vtoričnogo imperfektiva -yva-.

[Positionally restricted prefixes do not attach higher than the marker of secondary imperfectives *yva*.]

Since Tatevosov's restriction [**PR > yva*] is explicitly connected to the marking of secondary imperfectives, it would not be violated if the story just told was correct. But can it be correct?

If *yv(a)* was a marker of iterativity in perfective *dozapisyvat'*, *dovyšivat'*, etc., the macroevent relative to which the prefix *do-* “picks out” the terminative interval should be made of a plurality of completed recording events, embroidering events, etc. More generally put: For a form instantiating *do+PREF+ROOT+yva+t'* to be acceptable as perfective, the events denoted by *PREF+ROOT+yva* should be conceivable as consisting of a plurality of completed *PREF+ROOT*-events, realizing one after the other. Provisionally I call this condition “seriality requirement”.

The seriality requirement might point to an answer to the question of why some instances of *do+PREF+ROOT+yva+t'*, such as *dovyšivat'*, are widely accepted as perfectives in the tested sentences, while others such as *dozapisyvat'* are not (recall §3). Note that the event denoted by *vyšivat' kartinu* is easily conceivable as a series of by themselves completed embroidering events. Imagine I want to embroider the picture of a farm. First I embroider the sheep shelter, then I embroider the cock standing on dunghill, etc. Similar with the event denoted by *ustanavlivat' Windows*, because installing a computer program typically consists of installing different subprograms (files) one by one. Our world knowledge about these kinds of events is thus in harmony with the requirement of a series of completed events. Not so for the event denoted by *zapisyvat' pesnju*. This event is typically realized in one go. Otherwise the song would be interrupted and, so to speak, destroyed, undermining the very goal of the action. That we expect a song to be recorded in one go is at odds with the seriality requirement, which calls for a plurality of completed recordings, and this might be the reason why many informants reject (26), but not (25) and (24). An interesting observation in that regard is that judgements improve once (26) is framed in a music studio context. This fits into the picture because when a song is recorded in a music studio, different sound files will be recorded in a serial manner, one by one, each a completed recording, to make up the whole song in the end: first the trumpets get recorded, then the drums, etc.

And so, we hypothesized that it might be an obstacle for accepting a perfective verb instantiating the schema *do+PREF+ROOT+yva* if the *PREF+ROOT+yva*-event cannot easily be conceived of as a series of completed subevents. So far, so good. Unfortunately, however, the idea of internal iterative *yv(a)* faces severe problems.

First, it should be noted that this story involves a violation of the otherwise valid rule that the output of prefixation is perfective (recall §3.3). The violation concerns the second step in the assumed derivational history:

- (34) *pisat'*^{IPFV} ‘write’ → *pisyvat'*^{IPFV} ‘write again and again’ → *zapisyvat'*^{IPFV}
 ‘record again and again’ → *dozapisyvat'*^{IPFV} ‘finish recording’

A further concern is that the derivational history in (34) gives rise to a bracketing paradox. The syntactic derivation is not in line with the subsequent steps of semantic composition as shown in Figure 2.

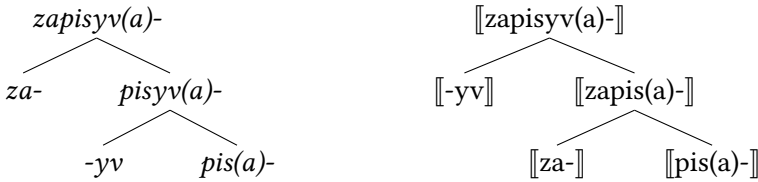


Figure 2: Bracketing paradox arising from (34)

The internal prefix *za-*, which enters the syntactic derivation only after application of iterative *yv(a)*, should have semantic access to the event description supplied by the initial predicate *pisat*^{IPFV}. This technical problem is perhaps not insurmountable; however, it is difficult to come up with an easy solution.

A further point relates to the particular case of perfective *doustanavlivat'*. The problem is that there is no verb *stanavlivat'* in Russian. The proposed derivational history would thus involve a gap – which must not occur according to the rules stated for felicitous derivational histories by Zinova & Filip (2015: 601–602):

- (35) *stanovit*^{IPFV} ‘put up’ → **stanavlivat*^{IPFV} ‘put up again and again’ → *ustanavlivat*^{IPFV} ‘install again and again’ → *doustanavlivat*^{PFV} ‘finish installing’

To sum up: The idea that perfective *dozapisyvat'* and its correspondents involve “internal iterative *yv(a)*” might seem promising at first glance. On closer inspection, however, it turns out that it produces more problems than it solves. How to get the semantic composition right (bracketing paradox)? Should gaps in a verb’s derivational history be tolerated? Should we really accept prefixation with imperfective output?

4.3 External iterative *yva*

Letting *yv(a)* attach low is not the only way to derive the seriality requirement observed in connection with perfective *dozapisyvat'* and similar verbs. An alternative would be to assume that *yv(a)* applying after prefixation does not always function as a secondary imperfective morpheme. Maybe, besides the imperfectivizing *yv(a)* *sensu stricto*, there is a homonymous iterativizing *yv(a)*. Let us call the former *-yv(a)*₁ and the latter *yv(a)*₂. If [^{*}PR > *yva*] could be restricted to *yv(a)* in its imperfectivizing function, i.e. to *yv(a)*₁, it would not be violated:

- (36) a. [[zapis]-yva₁]-t' 'to be performing a recording' ⇒ *dozapisyvat'^{PFV}
 b. [[zapis]-yva₂]-t' 'to perform multiple recordings' ⇒ dozapisyvat'^{PFV}

This story is superior to the one told in Section 4.2 in that it derives perfective *doustanavlivat'* without gap:

- (37) *stanovit'*^{IPFV} → *ustanovit'*^{PFV} → *ustanavlivat'*^{IPFV} → *doustanavlivat'*^{PFV}

A problem for the assumption of two homonymous *yv(a)*-morphemes is that, contrary to fact, one would expect [[do-[[zapis]-yva₂]]-va₁]-t'^{IPFV} to be a possible structure. Some extra constraint would be necessary to rule this out (see Tatevosov 2013a: 64–65 for discussion).

Another problem: if an iterative *yv(a)* was responsible for the existence of an otherwise impossible perfective *dozapisyvat'*, why should this option not also hold for *dopisyvat'*? That is to say, why does *dopisyvat'* not work as a perfective? Or does it?

- (38) *Ja diplom MBA načinala pisat' zaranee, za neskol'ko mesjacev,*
 I diploma MBA begin.PST.IPFV write earlier within some months
s naučnym rukovoditelem vstrečalas', obsuždala, [...]
 with scientific supervisor meet.PST.IPFV discuss.PST.IPFV
napisala tak pervye 10 stranic. Do trebuemogo ob"ema
 write.PST.PFV so first 10 pages until demanded volume
ostavalos' ešče 80. Dopisyvala za dve noči. V itoge
 remain.PST.IPFV still 80 finish.write.PST.PFV within 2 nights in end
vyšel na 120 stranic.
 out.go.PST.PFV on 120 pages
 'I started to write my MBA earlier on, some months ago, I met with my supervisor, discussed ... This way I wrote the first 10 pages. 80 pages remained to be written. Two nights before deadline, I was about to finish writing it. In the end my thesis came out with 120 pages.'
 (www.babyblog.ru)

At first glance, the adverbial *za dve noči* in the penultimate sentence might invite the conclusion that the verb *dopisyvala* is used in the perfective function in (38). A closer look reveals, however, that the expression *za dve noči* in (38) does not serve as an inclusive temporal adverbial, as it does in (9) and (10) above. Instead it is understood here as referring to a point in time located two nights before the final date of submission (the latter information has been omitted from sentence

surface). This, of course, changes the picture as now the use of an *imperfective* verb is well motivated. What is said here is that the speaker was in the final stages of writing down her MBA two nights before deadline. It is only the final sentence that informs us about the success of the endeavor.

Thus, it remains as a fact that *do-* may serve to perfectivize a base involving *yv(a)* only if the base also contains an internal/lexical prefix (but see below).

- (39) a. *dozapisyvat'* → perfective or imperfective
 b. *dopisyvat'* → only imperfective

If *yv(a)₂* was responsible for perfective *dozapisyvat'*, *dovyšivat'*, etc., we would expect perfective *dopisyvat'*, *došivat'*, etc. to be possible too – contrary to fact.

5 Proposal

What did we achieve so far in this paper? First of all, we convinced ourselves that the prefix *do-*^{completive} is indeed capable of perfectivizing bases involving *yv(a)*. For this to be possible, the base is required to contain an internal prefix. I thus basically confirm the position of [Zinova & Filip \(2015\)](#) and [Zinova \(2016\)](#). Perfective *dozapisyvat'* is real, its derivational history being (3), repeated here for convenience:

- (40) *pisat'*^{IPFV} → *zapisat'*^{PFV} → *zapisyvat'*^{IPFV} → *dozapisyvat'*^{PFV}

In addition to that, we developed a proposal to clarify issues left open by [Zinova & Filip \(2015\)](#) and [Zinova \(2016\)](#). The proposal boils down to the following generalization:

- (41) If *do-* attaches to a base involving *yv(a)* to perfectivize it, the base will denote a plurality of successively realizing completed events.

What I am going to do now is to show that (41) entails answers to, as far as I can see, all of the open questions that we came across in this paper.

5.1 The role of the internal prefix

A prerequisite for a predicate to provide a plurality of events is that it “specifies an individuation criterion for its application which determines what counts as ‘one’ whole event in its denotation” ([Filip 2017](#): 184). Without a clue as to what counts as one, pluralization is impossible. This individuation criterion (called

maximality condition in Filip 2008) is supplied by the internal prefix. This is why (41) implies an explanation for the pattern in (39), i.e. for the obligatory presence of an internal prefix: the internal prefix sanctions the interpretation that the prefix *do-* requires its input to have.

So-called “simple perfectives”, i.e. non-prefixed perfective verbs, such as *rešit* ‘solve’ or *kupit* ‘buy’, can be thought of as having their individuation criterion lexically built into the root meaning. If so, we would, given the reasoning from above, expect that the imperfective forms derived from simple perfectives may also serve as bases for *do-*. This seems to be borne out:

- (42) *Ksjuška dopisala referat po istorii, a Nazarka,*
 K. finish.write.PST.PFV referat in history whereas N.
nakonec, dorešal zadačku po matematike.
 finally finish.solve.PST.PFV exercise-DIM in mathematics
 ‘Ksjuška finished writing her presentation in history, and Nazarka
 finally finished solving a little exercise in mathematics.’
 (www.infourok.ru)

Starting from his assumption that *do-* is never able to apply above secondary imperfective morphology, Tatevosov (2009: 135) considers examples like (42) to indicate that the marker *-a* in perfective *dorešat* is a suffix *sui generis* and therefore excluded from generalization [$*PR > yva$]. In the light of the present proposal, an alternative hypothesis suggests itself: perfective *dorešat* may be viewed as a systematic exception to [$*PR > yva$], on a par with perfective *dozapisyvat*.

- (43) a. $rešit^{PFV} \rightarrow dorešit^{PFV} \rightarrow dorešat^{PFV}$
 b. $rešit^{PFV} \rightarrow rešat^{IPFV} \rightarrow dorešat^{PFV}$

Note that the predicate *rešat' zadaču* is compatible with the seriality requirement, because a mathematical problem often implies a solution path, requiring several self-contained steps (completed solving events) to take.⁶

5.2 The impact of *do-*

In this subsection I want to point out that my proposal is in line with the semantic analysis of completive *do-* put forward in Kagan (2012) and Kagan (2015). According to that analysis, the prefix *do-* applies to predicates *P* that entail an

⁶The same with Tatevosov's own example sentence, which contains the predicate *dorešat' vse svoi voprosy* ‘finish solving all of his questions’.

increase along a gradable property Q_P . Doing so, it imposes on interpretation the condition that, at the final moment of the event, the degree to which a participant comes to be characterized by Q_P matches the maximal value. In addition, it splits the whole increase to maximum into two parts, with only the final part being semantically entailed by the new predicate (the initial part is analyzed as presuppositional information).⁷

What counts as the maximal value of Q_P is determined by linguistic expressions accompanying the predicate. If the predicate is an incremental theme verb, the maximal value will be set by the direct object, as in (44), where the event is understood to finish when the final page of the book has been read (see Kagan 2015: 71).

- (44) *Vasja dočital knigu.*
 V. finish.read.PST.PFV book
 'Vasja finished reading a/the book.' (Kagan 2015: 71)

Given generalization (41), the predicate to which *do-* applies in the case of perfective *dozapisyvat'* or *dovyšivat'* fulfills these demands of the prefix. It entails an increase along a gradable property, where Q_P corresponds to the increasing number of completed events that are successively realized with time (recall Figure 1). Since *zapisyvat'* or *vyšivat'* are incremental verbs, the maximal value in the respective examples is set by the direct objects (in our examples: *kartinu* or *pesnju*).

5.3 Other positionally restricted prefixes

As discussed in §3, Zinova & Filip (2015) observe that there is no perfective *perezapisyvat'* 'to rerecord' on analogy to perfective *dozapisyvat'*. They conclude that *pere*-^{repetitive} produces an imperfective verb when attaching to a base containing an internal prefix and *yv(a)*, like *zapisyvat'*, and that it therefore violates the golden rule of Russian aspectology which says that the output of prefixation is always perfective.

In the light of (41), a different conclusion suggests itself, one that is not at odds with the "golden rule". According to (41), the attachment of a positionally restricted prefix to a base containing an internal prefix and *yv(a)* is licensed only if the base expresses an iteration of completed events ("seriality requirement"). This is so because otherwise the newly created perfective verb would be blocked

⁷Zinova (2016: 200ff.) presents evidence which suggests that the first event part is implicated rather than presupposed, but that discussion is irrelevant to our concerns here.

by its less complex rival. I propose that a plurality of events is just the wrong semantic input for *pere*-^{repetitive} to successfully apply.

Take Kagan's (2015: 144ff.) analysis of *pere*-^{repetitive}. According to that proposal, the impact of *pere*- (in that particular usage) is that it leads to the expression of two events, united under the umbrella of a common goal, which the first event alone fell short of. At least the second event has to satisfy the base predicate. The existence of the first event is presupposed, the existence of the second event is an entailment. The application of the prefix *pere*-^{repetitive} thus outputs a (modified) copy of the event described by the base predicate. This requires that the base supplies a *single* event.

Similarly, the semantics of a verb prefixed by *pod*-^{attenuative} is argued by Kagan (2015: 109) to involve the unification of a presupposed event and an entailed event. With reference to Plungjan (2001), Kagan characterizes the entailed event as a "reduced, 'diminished' realization" of the presupposed event. We can conclude that for *pere*-^{repetitive} and *pod*-^{attenuative} to work, the respective base predicates will have to characterize single events. And this is why they cannot do what *do*- can do.

5.4 No blocking

Why is perfective *dozapisyvat'* not blocked by the availability of perfective *dozapisat'*? This was the first open question addressed in §3. The question was motivated by the pragmatic principle "avoid complexity of expression", which says that, all other things being equal, less complex forms are preferred over more complex forms (see (17)). Now under the assumption of (41), it turns out that with respect to the two perfective forms *dozapisat'* and *dozapisyvat'*, it is not the case that all other things were equal. Indeed, the two forms do not only differ in complexity of form, but also in their semantic content. In *dozapisat'*, the gradable property whose maximal value the prefix *do*- declares as the finishing point of the event is the evolution of a single recording event, limited by the extent of the thing being recorded (i.e. the referent of the direct object). In *dozapisyvat'*, by contrast, the gradable property relevant for *do*- is the evolution of a series of recording events, realizing until the thing being recorded has finally been fully recorded. As a consequence of these distinct meanings we do not expect any blocking effect from (17), in line with the facts.

5.5 Coordination order in sequences of events

Two perfective clauses that are coordinated by means of *i* 'and' express a sequence of two events of the type described by the two verb forms used. "Se-

quence” means that the event introduced by the second clause is understood as immediately following the completion of the event of the first clause. The two events form a chain of events. In §3.2 we saw that coordinating two perfectives is problematic if the predicate of the second sentence is of the *dozapisyvat'*-type. Here I repeat the pattern from above, varying the examples. While (47) is fully acceptable, (46) is clearly degraded compared to (45).⁸

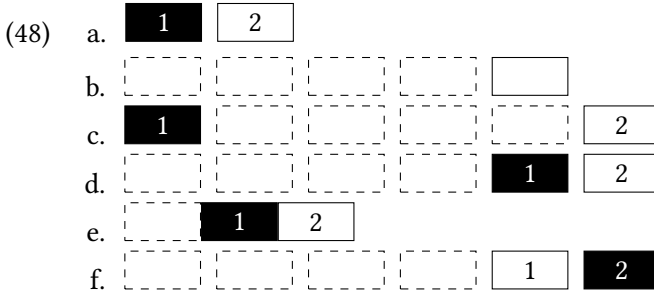
- (45) *Ja doustanavlival Windows i zakuril sigaretu.*
 I finish.install.PST.PFV W. and start.smoke.PST.PFV cigarette
 ‘I finished installing Windows and lightened a cigarette.’
- (46) ?? *Ja zakuril sigaretu i doustanavlival Windows.*
 I start.smoke.PST.PFV cigarette and finish.install.PST.PFV W.
 Intended: ‘I lightened a cigarette and finished installing Windows.’
- (47) *Ja zakuril sigaretu i doustanovil Windows.*
 I start.smoke.PST.PFV cigarette and finish.install.PST.PFV W.
 ‘I lightened a cigarette and finished installing Windows.’

The proposal developed in this paper offers an explanation of these facts. As we saw, the prefix *do-* splits the relevant upper-closed scale into two parts, letting only the final part be relevant for the asserted content. Moreover, according to (41), the relevant scale is made up of successively realizing completed events describable by the base predicate.

Given this, I propose that (46) is degraded because it involves a conflict. To begin with, the sequence of two completed events expressed by two coordinated perfective sentences is shown in (48a), where each box represents a completed event with the black box standing for the event denoted by the first sentence and the white box standing for the event denoted by the second sentence. Now, according to my analysis, perfective verbs like *doustanavlivat'* by themselves denote sequences of completed events, with only the final event of the sequence being assertoric content. This is depicted in (48b), where events of presuppositional content are indicated by dotted boxes. Now let the chain of completed events in (48b) replace event 2 in (48a), as suggested by (46). There are two possibilities of how this may be done, and both face a problem. The first option, given in (48c), is odd because event 1 and event 2 do not form a true chain of events, as

⁸This holds even for those speakers of Russian mentioned in fn. 3.

they do not directly succeed each other. The second option in (48d) is likewise odd, but for a different reason. Now the problem is that event 1 is no longer the first completed event in the chain.



(47) does not run into the same troubles as (46) because here the presuppositional part preceding event 1 is *part* of event 2 (tentatively indicated by that there are no gaps between the boxes). Therefore event 1 is still the first event to complete in the chain of events. Finally, if the two sentences are flipped, as in (45), event 1 can complete before the immediately succeeding event 2 without complications. This is shown in (48f).

5.6 How to explain asymmetrical judgements?

Certain instances of *do-* attaching to a secondarily imperfectivized predicate are accepted by almost everyone as perfectives (e.g. *dovyšivat'*), while others are often rejected as perfectives (e.g. *dozapisyvat'*). We saw that this asymmetry in judgements has been noted by Zinova & Filip (2015) and Zinova (2016), but not explained. I suggest a new explanation, which derives from (41). It has already been stated above in §4.2. Let me repeat it in a (hopefully) clear and concise manner:

- (49) A verb having the stem structure *do*+*PREF*+*ROOT*+*yva* may be felicitously used as a perfective only if the context of its use allows for the verb with the corresponding stem structure *PREF*+*ROOT*+*yva* to be interpreted iteratively.

In a context in which one can felicitously say *dozapisyvaju* 'I will finish recording', it should, according to (49), be possible to also felicitously say *zapisyvaju* 'I record again and again'; in a context in which one can felicitously say *dovyšival* 'I finished embroidering', it should be possible to also felicitously say *vyšival* 'I embroidered again and again'; etc.

6 Conclusions

In Tatevosov (2013b), the author holds the view that where [$*PR > yva$] is violated, this is due to a special property of *do-*. In particular, it is proposed that speakers of Russian belong to different dialects. One dialect strictly adheres to [$*PR > yva$], another one, called dialect D, is more liberal with respect to *do-*.⁹

(50) Dialect D

Unlike other positionally restricted prefixes, the prefix *do-* is not prohibited from attaching above the marker of secondary imperfectivization.

In the present paper, I argue in a similar vein that the prefix *do-* is outstanding in being the only positionally restricted prefix that allows for applying above *yv(a)*. This position implies, contra Zinova & Filip (2015), that there is, for instance, no verb *perezapisyvat'* in Russian which would be derived from prefixing *zapisyvat'* by *pere-*. Instead, *perezapisyvat'* is always imperfective as the result of secondarily imperfectivizing perfective *perezapisat'*. The prefix *pere*-^{repetitive}, in other words, behaves as predicted for a positionally restricted prefix from the point of view of the analysis of Tatevosov (2009; 2013a).

There is, however, one important feature of the present analysis that sets it apart from Tatevosov's position, bringing it closer to Zinova (2016) in spirit. If the present proposal is on the right track, the empirical generalization [$*PR > yva$] is not a purely formal constraint, as Tatevosov (2013b) emphasizes it to be. Instead it looks as if every positionally restricted prefix was in principle (that is, as far as formal limitations are concerned) free to apply above *yv(a)*, but that there are two obstacles that may hinder them from doing so. The first one is pragmatic in nature. It is the principle "avoid complexity", ultimately saying that the newly created structure (prefix over *yv(a)*) will be blocked if a less complex rival of identical meaning is available. The second obstacle is semantic in nature: the semantics of the prefix may not allow for iterative predicates as complements. But operating on an iterative meaning is the only way to create a meaning different from the meaning of the morphologically less complex perfective. Thus, it is the only way to escape being blocked by "avoid complexity". Among the positionally restricted prefixes, it is only *do-* which allows for iterative predicates as complements.

⁹Thanks to Yulia Zinova for drawing my attention to that paper.

Abbreviations

DEM	demonstrative	PREF	prefix
DIM	diminutive	PRON	pronoun
INF	infinitive	PRS	present tense
IPFV	imperfective aspect	PRT	particle
PFV	perfective aspect	PST	past tense

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Chapter 12

Demonstratives and definiteness: Multiple determination in Balkan Slavic

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Colloquial Bulgarian and Macedonian possess a nominal construction containing both a demonstrative and a definite article. This multiple determination (MD) structure is a single phrase with demonstrative heading DemP (spelling out features of the Dem head) and the article spelling out features of D, realized as a suffix on the next phrasal head: PossP, QP, AP, or in Macedonian NP. The affective interpretation of MD phrases derives from the interaction of demonstratives and the definite article: since the D head is independently spelled out by the article, the demonstrative spells out only relational features of Dem and has no definiteness features. Independent spell-out of D alongside Dem is made possible by the non-adjacency of the article suffix and the demonstrative. The emotive quality of MD accounts for its preference for colloquial and proximate demonstratives and articles.

Keywords: definite article, demonstrative, multiple determination, double definiteness, affective, definiteness agreement

1 Introduction to multiple determination

This paper deals with a specific type of MULTIPLE DETERMINATION (MD) found in the Balkan Slavic languages Bulgarian and Macedonian. Multiple determination is a cover term for various constructions in which a nominal phrase contains more than one marker of definiteness: two definite articles, or a demonstrative and a definite article, or a demonstrative or article plus a definiteness inflection.¹

¹Other terms are found in the literature for the same phenomena, or a subset of them: POLY-DEFINITENESS, DOUBLE DEFINITENESS, and DEFINITENESS AGREEMENT among them. I follow Joseph 2019 in choosing to refer to all constructions of this type as multiple determination.



Balkan Slavic MD involves a demonstrative and one or more definite article suffixes, see (1) and throughout the paper.²

- (1) *tija novite koli*
 these new.DEF cars
 ‘these new cars’ (Bulgarian)

Not all languages have MD constructions; English, for example, lacks phrases like **the big the book* or **this the book*. In languages which lack definite articles (including all Slavic languages other than Bulgarian and Macedonian) the issue simply does not arise. But MD is quite common and appears in languages worldwide. For instance, multiple definite articles are found in Hebrew and Arabic (Doron & Khan 2015), as well as Greek (Alexiadou & Wilder 1998). Swedish exemplifies cooccurrence of a definite article with a definiteness suffix (Alexiadou 2014). Demonstrative plus article combinations occur in languages ranging from Hungarian to Spanish (Giusti 2002) to Omaha-Ponca (Rudin 1993). The Balkan Slavic constructions which will be our main concern here are also of the demonstrative-plus-article type.

Regardless of their type, all MD constructions raise similar issues for the structure and interpretation of nominal phrases. Are MD constructions single DPs or are they perhaps some kind of appositive or nested construction with more than one DP? If the MD string is a single DP, does each of the definiteness elements (demonstrative, article, and/or inflection) make a separate contribution to the meaning of the phrase, or does one or more of them simply constitute definiteness agreement? What is the syntactic position of each of these elements, and what is the overall structure of the nominal phrase, i.e. what categories are projected and how? The answers to these questions vary; in fact, it is clear that MD constructions are far from homogeneous.³ A case of likely definiteness agreement is Hungarian, where a demonstrative is always accompanied by a single definite article following it, as in (2). The article is obligatory and does not contribute any special semantics; the interpretation is that of a normal deictic demonstrative.

- (2) *ez *(a) lány*
 this the girl
 ‘this girl’ (Hungarian)

²Balkan Slavic includes Macedonian, Bulgarian, and the transitional Torlak dialects of East Serbia. I unfortunately lack sufficient Torlak data to include it in this paper. The other South Slavic languages, BCMS and Slovenian, do not participate in the Balkan Sprachbund and are not considered Balkan Slavic.

³For a more extensive overview than I can give here, see Alexiadou 2014.

We will see below that this is quite unlike the Balkan Slavic MD construction, in which an article is optional and does contribute additional meaning.

Flexible order is a diagnostic of likely appositive structure. In Greek, both article + article (3) and demonstrative + article (4) constructions exhibit variable word order, suggesting that the demonstrative *afto* and the various strings beginning with an article each constitute a separate DP.

- (3) a. *to megalo to kokkino to vivlio*
 the big the red the book
 b. *to vivlio to megalo to kokkino*
 the book the big the red
 ‘the big red book’ (Greek; Alexiadou & Wilder 1998)

- (4) a. *afto to puli*
 this the bird
 b. *to puli afto*
 the bird this
 ‘this bird’ (Greek; Joseph 2019)

In some languages demonstrative + article occurs only with non-canonical word order, again suggesting a different structure than a single normal DP. A familiar example is Spanish, where an article is found only with post-nominal demonstrative. Giusti 2002 argues this final demonstrative is generated low within DP.

- (5) a. *el chico este*
 the boy this
 ‘this boy’
 b. *este (*el) chico*
 this the boy
 ‘this boy’ (Spanish)

My initial interest in MD was in Omaha-Ponca, a Siouan language spoken in Nebraska. In this language, demonstrative and article can combine directly, as in (6a); here the demonstrative is pronominal. Multiple articles are also found, as in (6b)–(6d), though this is not obligatory. In Rudin (1993) I argued that most if not all MD constructions in Omaha-Ponca are a series of appositive DPs. Word order within the MD constructions is quite free (compare (6b) and (6c)) and more than one noun can be involved (see (6d)), both characteristics which suggest multiple separate DPs.

- (6) a. *thé ak^há*
 this the
 ‘this guy, this one’
 b. *thé ak^há níkashiⁿga ak^há nóⁿba ak^há*
 this the person the two the
 ‘these two people’
 c. *níkashiⁿga ak^há nóⁿba ak^há thé ak^há*
 person the two the this the
 ‘these two people’
 d. *níkashiⁿga ak^há winégi akhá Marvin ak^há*
 person the my.uncle the Marvin the
 ‘that person, my uncle Marvin’ (Omaha-Ponca; Rudin field tapes⁴)

Although in Greek, Spanish, and Omaha-Ponca a demonstrative with an articulated noun or adjective arguably has some special status, as a separate (pronominal) DP and/or located outside the left periphery of DP, none of the indications leading to such conclusions are present in Balkan Slavic. Bulgarian and Macedonian MD constructions are not appositive.⁵ Nor is the Balkan Slavic construction a simple case of definiteness agreement. I argue below that MD phrases in Bulgarian and Macedonian are single DPs, with demonstrative and article in their normal syntactic positions, and with special semantics produced by the combination of demonstrative + definite article.

2 Balkan Slavic MD: The data

Before proposing an analysis, in this section I present an overview of the Balkan Slavic MD construction of interest for this paper, including its basic form, meaning, and usage (§2.1), the article and demonstrative morphemes involved (§2.2), its syntactic characteristics (§2.3), and the role of intonation (§2.4).

⁴The Omaha-Ponca examples are from my own fieldwork on this language in the 1980s-90s, partially supported by National Science Foundation grant #BNS-890283.

⁵One exception to this generalization should be mentioned, a separate construction involving demonstratives with articulated forms of a small group of quantificational or identity adjectives with meanings like ‘all’ or ‘same’, in both Bulgarian and Macedonian. This construction behaves quite differently from the one discussed here, both syntactically and semantically, and probably is an appositive structure. See Rudin 2018 for details.

2.1 The object of study, its usage, and its semantic characteristics

In standard, literary Macedonian and Bulgarian, demonstratives and articles do not cooccur; a nominal phrase can contain either a demonstrative or a definite article (the suffix glossed DEF) but not both, regardless of word order.

- (7) a. *tozi čovek*
this person
'this person'
- b. *čovekāt*
person.DEF
'the person'
- c. * *tozi čovekāt* / * *čovekāt tozi* (literary Bulgarian)
this person.DEF person.DEF this
- (8) a. *ovoj čovek*
this person
'this person'
- b. *čovekov*
person.DEF
'the person'
- c. * *ovoj čovekov* / * *čovekov ovoj* (literary Macedonian)
this person.DEF person.DEF this

However, in colloquial usage, both languages do combine a demonstrative with a definite article. MD constructions are quite common in speech and in informal written contexts such as social media. Their association with more personal registers is no accident, as they tend to express “emotivity” or “subjective affect” (Friedman 2019), either positive or negative. To give a sense of typical MD usage, (9)–(10) present attested examples with a bit of context; the MD phrase is bracketed for ease of reading:

- (9) a. [*toja otvratitel'nija navik kojto imaš da pljunčiš prāsta si*] ...
that disgusting.DEF habit which have.2SG to spit.2SG finger REFL
'that disgusting habit you have of licking your finger' (makes me not
want to touch your books) (Bulgarian; social media)

- b. *Ej, [tezi našite prijатели] napravo ni ostavixa bez dumi.*
 wow those our.DEF friends straight us left.3PL without words
 ‘Wow, those friends of ours simply left us speechless.’ (they served
 such great food) (social media)
- (10) a. *Da vidime so [ovie drugive goveda] šo ke se prai.*
 to see.1PL with those other.DEF cattle what will REFL do
 ‘Let’s see what to do about those other dumb animals.’ (politician
 referring to voters) (Macedonian; Prizma 2015)
- b. *Super se [ovie novive mastiki od Španija].*
 super are these new.DEF mastikas from Spain
 ‘These new mastikas (liquors) from Spain are great.’ (with photo of a
 pack of chewing gum called “mastiki”) (social media)

These are taken from Facebook, blogs, and transcribed conversation.⁶ The (a) examples are deprecating: (9a) expresses dislike of a particular habit, and (10a) sneers at a group of people, calling them “cattle”. The (b) examples project positive affect: (9b) gushes about what good cooks “our” friends are, and (10b) shows enthusiasm for a new chewing gum whose name sounds like a traditional Balkan alcoholic drink. This characteristic affectivity will be the focus of §3.2 and §3.4 below. The MD phrases in this example set all consist of a demonstrative, an adjective (which carries the definite article suffix), and a noun, but this is not necessary; other types of DPs including a definite article can also occur with a demonstrative, as we will see.

MD phrases with demonstrative + definite article are fully acceptable in colloquial usage, sometimes even preferred by speakers as being more natural than a DP with a demonstrative alone. They have been noted in the linguistic literature; see for example Ugrinova-Skalovska 1960/61, Arnaudova 1998, Tasseva-Kurktchieva 2006, Hauge 1999, Mladenova 2007, Dimitrova-Vulchanova & Mišeska Tomić 2009, Friedman 2019.⁷ However, no consensus about a formal analysis emerges from these sources. Some are purely descriptive or historical, some merely mention MD constructions in making a point about some other topic, and some confuse the issue by conflating the MD construction addressed here

⁶The extensive set of recorded and transcribed Macedonian phone conversations known as the “Bombi” for their explosive political content are available as Prizma 2015 and described in Friedman 2016, Friedman 2019.

⁷Earlier versions of my own work on this topic are also available: Rudin 2018, Rudin to appear. These are partially though not completely superseded by the present paper.

with superficially similar data involving demonstratives and articles, including the quantifier construction described in footnote 5 and various appositive constructions.

The most detailed formal treatment is Laskova 2006, which proposes a reduced relative clause analysis of some Bulgarian ‘double definiteness’ constructions. These however are rather different from those of interest here. Much of her data does not involve a demonstrative, instead consisting of two-word phrases of which the second is always an adjective, and which always have comma intonation.⁸ As I show in §2.4, comma intonation indicates a different structure, not the MD construction of interest here. Laskova’s main claim, that the second element of the construction is always a predicative adjective with restrictive semantics, does not hold for the true MD construction, whose second element is often not an adjective at all, but a quantifier, possessive, or (in Macedonian) a noun. In short, the Balkan Slavic MD construction I am interested in has not previously received a full analysis. This, of course, is the goal of the present paper.

2.2 Morpho-lexical characteristics: The articles and the demonstratives

As already noted, the MD construction in Bulgarian and Macedonian contains two components usually considered indicators of definiteness: a demonstrative and a suffixal definite article. Before delving into their syntax, it will be useful to take a look at these components. Bulgarian and Macedonian each possess a number of lexical items in the relevant categories, but their inventories of demonstratives and articles are rather different. Bulgarian has the inventory in Table 1, with four sets of demonstratives, differing in stylistic level (neutral vs. informal/-colloquial) and perceived distance. There is only one set of articles.⁹

Macedonian, as shown in Table 2, lacks the stylistic difference between colloquial and more formal demonstratives, but makes another distinction: a three-

⁸Laskova examines three ‘double definiteness’ structures: [demonstrative adjective+DEF], [possessive+DEF adjective+DEF], and [numeral+DEF adjective+DEF]. Only the first of these is our MD construction. The cases without demonstrative have obligatory comma intonation indicating appositive structure. Laskova does not recognize MD constructions with anything other than a single adjective, for example those with a demonstrative plus more than one definite adjective, a demonstrative plus a definite numeral or possessive (or both), possibly also followed by one or more adjectives, or in Macedonian, a demonstrative followed by a definite noun. All of these not only exist, but have the same semantic and other characteristics as her [demonstrative adjective+DEF] type and should be treated under a single analysis.

⁹The gloss of the articles as masculine, feminine, neuter, and plural forms is oversimplified. In fact, choice of article depends in part on the phonological shape of the host word. For instance, neuter plural nouns ending in *a* take the *-ta* article, not *-te*: *teletata* ‘the calves’, and masculine singulars ending in *o* take the *-to* article instead of *-ã(t)*: *djadoto* ‘the grandfather’. Similar

Table 1: Bulgarian demonstratives and articles

	neutral demonstrative	colloquial demonstrative	article
proximal	tozi/tazi/tova/tezi 'this.M/F/N/PL'	toja/taja/tuj/tija 'this.M/F/N/PL'	-(j)ă(t)/-ta/-to/-te
distal	onzi/onazi/onova/onezi 'that.M/F/N/PL'	onja/onaja/onuj/onija 'that.M/F/N/PL'	'the.M/F/N/PL'

Table 2: Macedonian demonstratives and articles

	demonstrative	article
proximal	ovoj/ovaa/ova/ovie 'this.M/F/N/PL'	-ov/-va/-vo/-ve 'the.M/F/N/PL'
neutral	toj/taa/toa/tie 'that.M/F/N/PL'	-ot/-ta/-to/-te 'the.M/F/N/PL'
distal	onoj/onaa/ona/onie 'that.M/F/N/PL'	-on/-na/-no/-ne 'the.M/F/N/PL'

way deictic split between proximal, neutral, and distal series with roots *-v-*, *-t-*, and *-n-*, respectively, not only in the demonstratives but also in the articles.

MD occurs with all demonstratives and all articles, in both languages, but is more natural for some speakers and probably more common with the less formal demonstrative series in Bulgarian, and far more frequent with the proximate demonstrative and article series in Macedonian. This relates to their colloquial nature and their function of expressing emotional reaction or personal involvement. Demonstrative and article in MD agree in all features: gender, number, and also deixis in Macedonian.

The Macedonian *-v-*, *-t-*, and *-n-* series, both articles and demonstratives, can denote physical distance, but can also indicate metaphorical or psychological distance, i.e. speaker's attitude. The articles are worth noting in particular, given that deixis is not usually marked on articles. Victor Friedman (p.c.) gives the following example of affective use of the articles: A native of Ohrid is likely to

facts obtain in Macedonian, so the glosses in Table 2 are equally oversimplified. This will be relevant in discussion of the articles' status, below. The Bulgarian masculine article has several different forms depending on phonological environment and (in normative usage) also case: *-(j)ăt* is nominative, while *-(j)a* is objective.

refer to Lake Ohrid, on whose shores she has grown up, with the proximal *-v-* article as in (11a), in speaking to another Ohrid native, but more apt to use the neutral *-t-* article as in (11b) in speaking to someone from a different area.

- (11) a. *ezerovo*
lake.DEF.PROX
'the lake (which you and I both feel connected to)'
b. *ezeroto*
lake.DEF.NEUT
'the lake (no special connotations)' (Macedonian)

Although contrastive spatial deixis is more commonly expressed by means of demonstratives (Karapejovski2017), the articles can also be used in this way. If two people are standing in a parking lot deciding who will drive which car, they can say (12), distinguishing two cars just by choice of article.¹⁰

- (12) *Ti vozi ja kolava, a jas ke ja vozam kolana.*
you drive it car.DEF.PROX and I will it drive car.DEF.DIST
'You drive the (closer) car, and I'll drive the (farther) car.' (Macedonian)

It is worth asking whether the Macedonian articles are actually definite articles at all, or instead some type of demonstrative. This is less an issue for Bulgarian, with its single set of articles. However, even in Bulgarian there are hints of deictic function in the definite article system (Mladenova 2007). The Rhodope mountain dialects have a similar phenomenon to that in Macedonian, with three sets of articles differing in their consonantal root, in this case with *-s-* said to mean 'near the speaker' and *-t-* 'near the hearer'. The Torlak dialects of East Serbia, on the Bulgarian border, also have suffixal definite articles with deictic features. In fact, there appears to be a tendency across the Balkan Slavic dialect continuum for deictic articles to crop up, in separate areas: the Western Macedonian dialects which are the source of the standard Macedonian article system are not contiguous to the Bulgarian dialects with similar distinctions. The Balkan Slavic definite articles, like articles in many languages, derive diachronically from demonstratives (see Mladenova 2007 for a detailed history), so it is not surprising that they retain some demonstrative-like functions while transitioning to article status.¹¹

¹⁰I owe this example to Marjan Markovik (p.c.), who adds that in this case 'there is no emotivity or sense of affiliation, here there is only closer and farther' (my translation). That is, just like the demonstratives (see §3.2), the different article series can express either deictic or affective meaning.

¹¹In various languages items classified as articles can have a range of features beyond pure definiteness, often connected to their historical origin. For instance, in Omaha-Ponca (Siouan) the definite articles, some of which derive from positional verbs, distinguish animacy, position for inanimates (vertical/horizontal/round), and discourse centrality or agency for animates. *Ak^há* in (6) is the proximate (agentive, center-stage) animate article (Eschenberg 2005).

Nonetheless, the Balkan Slavic definite articles do differ semantically as well as syntactically from demonstratives. In standard Bulgarian they are simply definiteness inflections, with no deictic or affective meaning. Even in Macedonian their primary function is marking definiteness. **Karapejovski2017** shows that the Macedonian articles diverge significantly from demonstratives in usage, particularly in the case of the neutral *-t-* article, which occurs in several situations which do not admit canonical deictic demonstratives: with generics (13), situationally definite nouns (14), possessives (15), nominalized adjectives (16), and occupations (17). Examples (13) through (17) are all from Karapejovski's article.

- (13) a. *Lekarite sekogaš postapuvaat etički.* (generic)
doctors.DEF always act ethically
'Doctors always behave ethically.'
- b. *Tie lekari sekogaš postapuvaat etički.* (certain, specific)
those doctors always act ethically
'These doctors always behave ethically.' (Macedonian)
- (14) a. *Sonceto izgreva vo 7 časot.*
sun.DEF rises at 7 hour.DEF
'The sun comes up at 7 o'clock.'
- b. ? *Toa sonce izgreva vo 7 časot.*
that sun rises at 7 hour.DEF
(Macedonian)
- (15) a. *Ja vidov kuĸata na Racin.*
it saw.1PL house.DEF of Racin
'I saw Racin's house.'
- b. ? *Ja vidov taa kuĸa na Racin.*
it saw.1PL that house of Racin
(Macedonian)
- (16) a. *Dojde deŹurniot.*
came.3SG on-duty.DEF
'The duty-officer came.'
- b. ? *Dojde toj deŹuren.*
came.3SG that on-duty
(Macedonian)

- (17) a. *Go vidov profesorot Petkovski.*
 him saw.1SG professor.DEF P.

‘I saw Professor Petkovski.’

- b. ? *Go vidov toj profesor Petkovski.*
 him saw.1SG that professor P.

(Macedonian)

The grammaticality judgment of ‘?’ instead of ‘**’ given by Karapejovski presumably reflects the fact that the (b) versions of these sentences (and a generic reading in (13b)) are possible with a different reading of the demonstrative: affective rather than canonical deictic. Thus (14b) might mean something like ‘That sun rises at 7:00! It’s so early!’ conveying an evaluative attitude toward the sun rather than (implausibly) specifying which of a set of suns. See §3.2 for further discussion of noncanonical demonstratives. The affective reading is often expressed by the MD construction but is also possible with a demonstrative alone.

Arnaudova 1998 provides somewhat similar facts for Bulgarian, pointing out that there are situations in which demonstrative and article are not equally acceptable. These include occurrence with non-predicative and “modal” adjectives (18), possible for article but not demonstrative, and in existential constructions (19), possible for demonstrative but not article. The examples are Arnaudova’s.

- (18) a. *Drazni me samoto prisăstvie na Ivan.*
 bothers me mere.DEF presence of Ivan

‘Ivan’s mere presence annoys me.’

- b. * *Drazni me tova samo prisăstvie na Ivan.*
 bothers me that mere presence of Ivan
 intended: ‘That mere presence of Ivan annoys me.’

(Bulgarian)

- (19) a. * *Ima knigite v bibliotekata.*
 there’s books.DEF in library.DEF
 intended: ‘There’s the books in the library.’

- b. *Ima tezi knigi v bibliotekata.*
 there’s these books in library.DEF
 ‘There’s these books in the library.’

(Bulgarian)

The Macedonian *-v-* and *-n-* articles, as might be expected given their deictic meaning, are more likely to occur in situations where a demonstrative could

also be found, though unlike demonstratives they usually lack focusing or contrastive function. Karapejovski suggests that the *-t-* suffixes are true definite articles, while the *-v-* and *-n-* ones are semantically closer to demonstratives.

All of the articles, regardless of deictic features, behave alike syntactically (and are equally unlike the demonstratives in this regard). I consider all of the articles to have the same syntactic status, namely that of inflectional definiteness markers spelling out features of D, as will be fleshed out in §3.1. First, however, an overview of the behavior of both articles and demonstratives within the MD construction will be useful.

2.3 Syntactic characteristics

In the Balkan Slavic MD construction the demonstrative must be initial. Word order is identical to that of a “normal” DP, with demonstrative followed by modifiers (quantifiers, possessives, adjectives) and eventually a noun. No other order is possible, in either Bulgarian or Macedonian, strongly indicating that this type of MD is a single DP. Note the ungrammatical (b) and (c) examples in (20) and (21).

- (20) a. *tija hubavite rokli*
 these pretty.DEF dresses
 ‘these pretty dresses’
 b. * *hubavite tija rokli*
 pretty.DEF these dresses
 c. * *hubavite rokli tija* (Bulgarian)
 pretty.DEF dresses these
- (21) a. *tie ubavite fustani*
 these pretty.DEF dresses
 ‘these pretty dresses’
 b. * *ubavite tie fustani*
 pretty.DEF these dresses
 c. * *ubavite fustani tie* (Macedonian)
 pretty.DEF dresses these

It is possible for more than one definite article suffix to appear in the MD construction. The additional article(s) are in parentheses in (22).

- (22) a. *tija tvoite hubavi(te) rokli*
 these your.DEF pretty.DEF dresses
 ‘those pretty dresses of yours’ (Bulgarian)
- b. *tie tvoite ubavi(te) fustani(te)*
 those your.DEF pretty.DEF dresses.DEF
 ‘those pretty dresses’ (Macedonian)

The slight failure of parallelism between the Bulgarian and Macedonian examples (lack of an article on *rokli* ‘dresses’ in (22a)) will be addressed below. There is some speaker variation in acceptability of multiple articles; in particular some Bulgarian speakers find (22a) marginal.¹² However, they are clearly better than repeated articles outside of the demonstrative + article MD construction. When no demonstrative is present, only one article can occur, when the string of words is spoken as a single phrase, i.e. without comma intonation.

- (23) a. *tvoite hubavi(*te) rokli*
 your.DEF pretty.DEF dresses
 ‘your pretty dresses’ (Bulgarian)
- b. *ubavite fustani(*te)*
 pretty.DEF dresses.DEF
 ‘the pretty dresses’ (Macedonian)

The normal position for the definite article suffix in Balkan Slavic languages is roughly speaking on the first word of the DP; see below for a more detailed formulation. In an MD phrase, a single article occurs suffixed to the first word after the demonstrative. When there is more than one article, the suffix must attach to a series of adjacent items following the demonstrative. It is not possible to skip a link in the “chain” of articles. In (24)–(25) if the first modifier, *tvoi* ‘your’ is not articulated, no later element can have an article.

- (24) a. *tija tvoite novi(te) telefoni*
 these your.DEF new.DEF phones
 ‘those new phones of yours’
- b. * *tija tvoi novite telefoni* (Bulgarian)
 these your new.DEF phones

¹²It is not clear whether this variation is purely idiolectal or has a broader geographical or other dialectal basis. Macedonian speakers, to the best of my knowledge, uniformly accept examples like (22b), though repeating articles are rather uncommon.

- (25) a. *ovie tvoive novi(ve) telefoni(ve)*
 those your.DEF new.DEF phones.DEF
 ‘those new phones of yours’
 b. **ovie tvoi novive telefoni(ve)*
 those your new.DEF phones.DEF
 c. **ovie tvoi novi telefonive* (Macedonian)
 those your new phones.DEF

Macedonian and Bulgarian MD constructions are almost identical syntactically, but they do differ in one important respect, namely in the behavior of nouns. We have already seen a definite article on a noun rather than (or in addition to) an adjective or other modifier in some of the Macedonian examples above, but not in the Bulgarian ones. In Macedonian, lexical nouns freely participate in the MD construction, occurring with a preceding demonstrative and an article suffix:

- (26) *taa tetratkata / ovie decava / onoj čovekon*
 this notebook.DEF these children.DEF that person.DEF
 ‘this notebook / these children / that person’ (Macedonian)

In Bulgarian, however, the equivalent phrases are ungrammatical when pronounced as a single phrase.

- (27) **taja tetradkata* / **onija decata* / **tozi čoveka* (Bulgarian)
 this notebook.DEF those children.DEF that person.DEF

Some apparent nouns do take articles in Bulgarian MD phrases (as well as in Macedonian); however, these are not true nouns but other categories: the articulated words in (28) and (29) presumably modify a null N head. So for example *bogative/bogatite* ‘the rich’ is equivalent to *bogative luǵe/bogatite xora* ‘the rich people’).

- (28) *ovie bogative / ovoj mojov / ovie naše polupismenive*
 these rich.DEF this my.DEF these our.DEF semiliterates.DEF
 ‘these rich folks / this guy of mine / those semiliterates of ours’
 (Macedonian)

- (29) *tija bogatite / tija četirimata / onija našite polugramotnite*
 these rich.DEF these four.DEF those our.DEF semiliterates.DEF
 ‘these rich folks / those four (people) / those semiliterates of ours’
 (Bulgarian)

Summing up, the syntactic characteristics of Balkan Slavic MD are as follows:

1. it necessarily includes an initial demonstrative;
2. it contains at least one definite article suffix, on the first element following the demonstrative;
3. it can also contain multiple articles on subsequent constituent(s);
4. the two Balkan Slavic languages differ in whether lexical nouns can be articulated in MD: yes in Macedonian; no in Bulgarian.

2.4 Intonational characteristics

It has already been noted several times that the construction under consideration here is pronounced as a single intonational phrase, without a heavy pause or comma intonation. This turns out to be crucial. Many of the characteristics noted in the preceding section do not apply to similar-looking strings with an intonation break.

For instance, the judgment in Bulgarian that nouns do not participate in MD holds only with smooth intonation. We have seen that single phrases like (30), with demonstrative followed by an articulated noun, are ungrammatical, but with comma intonation indicating appositive structure it becomes perfectly possible to say (31a). This has the same structure as (31b), with a clearly separate, non-agreeing demonstrative (neuter instead of feminine).

- (30) * *taja tetradkata*
 that notebook.DEF
 intended: ‘that notebook’ (Bulgarian)

- (31) a. *Daj mi taja, tetradkata!*
 give me that notebook.DEF
 ‘Give me that one, the notebook!’
 b. *Daj mi tova, tetradkata!*
 give me that.N.SG notebook.DEF
 ‘Give me that (thing), the notebook!’ (Bulgarian)

Sequences including two definite articles without a demonstrative are also acceptable with comma intonation, in both Macedonian and Bulgarian. Speakers of both languages reject examples like (32) but often add that they would be possible if pronounced with a pause, as in (33). This, like (31a), is clearly an appositive construction, not the same structure as MD spoken with smooth intonation.

- (32) * *tvojata starata kola*
 your.DEF old.DEF car
 intended: ‘your old car’ (Bulgarian)

- (33) *Da vzemem tvojata, starata kola!*
 to take.1PL your.DEF old.DEF car
 ‘Let’s take yours, the old car!’ (Bulgarian)

Furthermore, word order, which is invariable in the MD construction, becomes quite free with comma intonation (appositive structure), as can be seen in (35) as opposed to (34). Once again, Macedonian examples would look similar.

- (34) *taja novata kăšta*
 this new.DEF house
 ‘this new house’ (only possible order) (Bulgarian)

- (35) a. *taja, novata kăšta*
 this new.DEF house
 ‘this one, the new house’
 b. *novata, taja kăšta*
 new.DEF this house
 ‘the new one, this house’
 c. *taja kăšta, novata*
 this house new.DEF
 ‘this house, the new one’
 d. *kăštata, taja novata*
 house.DEF this new.DEF
 ‘the house, this new one’ (Bulgarian)

Angelova (1994) gives attested spoken examples with articulated nouns and N-Adj order, both impossible in true MD; for instance (36). Though she does not always spell such examples with a comma, pause intonation is required.

- (36) *mebelite, porăčanite*
 furnishings.DEF ordered.DEF
 ‘the furniture, the (stuff that was) ordered’ (Bulgarian)

Failure to take intonation into account has been a source of confusion in earlier works, as disagreements on data acceptability may often trace back to imagining printed words with different intonations. *Arnaudova 1998*, to give just one example, presents *tazi ženata* ‘this woman.DEF’ as grammatical in Bulgarian, while speakers I consulted reject phrases like this, with demonstrative + article noun, unless pronounced with comma intonation (see (30) and (31a) above). She also states that some speakers accept MD only with a pause. Presumably what this means is that some prescriptively-inclined speakers reject the colloquial MD construction altogether and only allow multiple definiteness marking when there is more than one DP, that is, in appositives. In this paper I deal only with the single-phrase, no-comma MD construction.

3 Analysis

Up to this point, we have simply surveyed the facts of the Balkan Slavic MD construction. Namely, it is a single phrase (pronounced as an unbroken prosodic unit), which begins with a demonstrative, has at least one definite article suffix, on the following constituent, with the possibility of repeating article(s) on subsequent elements, and is affective in its meaning. These facts hold for both Bulgarian and Macedonian. The two languages differ in their lexical repertoire of articles and demonstratives, and in the participation of nouns in the MD construction. To account for the syntactic and semantic/pragmatic characteristics of MD phrases we need to specify the location and behavior of two elements, the demonstrative and the definite article, and explain how these two items together produce the appropriate meaning. The following subsections present an analysis of articles first (§3.1), then demonstratives (§3.2, §3.3), and finally their interaction (§3.4).

3.1 Balkan Slavic “articles” are definiteness inflection

Let us start with the article. I propose the structure in Figure 1 for a Balkan Slavic definite DP with article only (no demonstrative). The D head itself is phonologically null, but its [+def] feature is spelled out as the definite article suffix, on the head of the next phrase after D. The article is thus essentially an agreement affix, agreeing with a definite D. The phrase whose head hosts the article/definiteness agreement can be NP or a modifier phrase such as AP or QP.

Treating the definite article as an inflection is not a novel proposal. Figure 1 follows *Franks’s (2001)* analysis, in which an *Abney*-type DP structure with AP

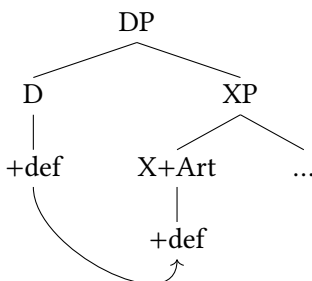


Figure 1: DP with DEF article

over NP ensures that the first head to the right of D is also the highest head. For simplicity I assume this type of DP structure here: roughly [DP [PossP [QP [AP [NP]]]]]. However, the analysis can easily be adapted to a structure with AP as an adjunct within NP rather than dominating NP. Under one such scenario, definiteness agreement within NP would extend not only to the head N but also to any adjoined modifiers, including AP, and their heads, and would be overtly realized on the highest (leftmost) of these. Regardless of the structure assumed, a rich literature exists showing that the suffixed elements traditionally called definite articles in Balkan Slavic (the items glossed DEF in this paper) are an inflectional manifestation of definiteness, marked on the head of the first phrasal projection after D. In simple cases this means DEF appears on the first word of the DP:

- (37) a. *kolite*
 cars.DEF
 ‘the cars’
 b. *belite koli*
 white.DEF cars
 ‘the white cars’
 c. *trite beli koli*
 three.DEF white cars
 ‘the three white cars’
 d. *našite tri beli koli*
 our.DEF three white cars
 ‘our three white cars’

(Bulgarian)

This looks like a second-position clitic phenomenon and in fact numerous accounts have treated it as such, deriving the article’s position by movement –

either raising the host to D (e.g. Arnaudova 1998; Tomić 1996) or lowering the article (e.g. Embick & Noyer 2001). But any movement account runs into difficulty with more complex examples like (38), where DEF follows neither the first prosodic word nor the first phrase but instead marks the head of AP with both pre- and post-modifiers. An inflectional account in which definiteness is manifested on the head of the projection immediately below DP accounts for the position of the article in all cases.

- (38) *mnogo gordija ot bašta si sin*
 very proud.DEF of father REFL son
 ‘the son who is very proud of his father’ (Bulgarian)

Furthermore the definite article behaves like an inflectional suffix, not like the numerous, mostly Wackernagel-type clitics of Bulgarian and Macedonian, in several ways:

1. Unlike clitics, the article counts as part of the word for phonological processes such as final devoicing and liquid-schwa metathesis;
2. Unlike clitics, which are invariant in form, the article’s form depends on the phonological form of the host word (see Footnote 9);
3. Unlike clitics, the articles exceptionally fail to occur with certain hosts.

Some nouns, including *majka* ‘mother’ and certain other relationship terms, essentially have a zero definite form; they are interpreted as definite but take no overt article. Bulgarian proper name diminutives similarly differ in whether they allow a definite article or not (Nicolova 2017). Examples of these clitic vs. article differences can be found in Rudin to appear, as well as earlier sources including Elson 1976, Halpern 1995, Franks 2001, and Koev 2011. These works all focus on Bulgarian, but the arguments are valid for Macedonian as well. The inflectional status of Balkan Slavic articles seems indisputable. The MD construction adds yet another argument for this well-established conclusion, namely the possibility of more than one definite article suffix, as in examples (22) through (25). A textual example of multiple articles is (39).

- (39) *ovie našive polupismenive što gledaat denes*
 these our.DEF semiliterates.DEF who watch.3SG today
 ‘those semiliterates of ours who are watching today’
 (Macedonian; Prizma 2015)

Multiple articles would be extremely problematic for any movement account of the definiteness suffix. If the article was a D head to which a host raised and adjoined, presumably multiple articles would require multiple D heads and thus multiple DPs. Similar problems arise for an account of D lowering or prosodic inversion. Under an inflectional account we simply allow definiteness agreement optionally to spread to subsequent (lower) heads as well as the one immediately below D; Figure 2 represents the relevant portion of (39).

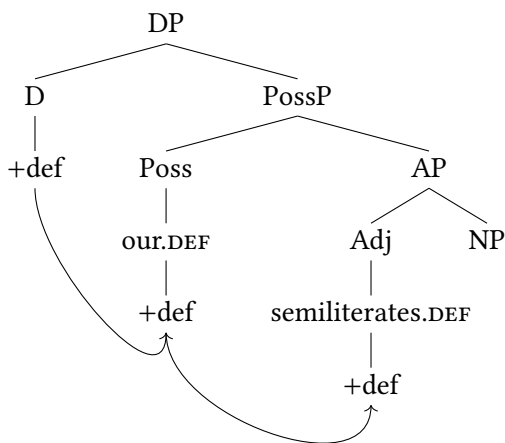


Figure 2: DP with multiple definiteness agreement

3.2 Balkan Slavic demonstratives spell out DemP head

Demonstratives are a surprisingly slippery and variable category crosslinguistically. Coniglio et al. 2018 point out that demonstratives as a class are difficult to define morphologically or syntactically; in various languages lexical items described as demonstratives can be instantiated as different categories, including pronouns, determiners, and adjectives among others, and exhibit a range of morphosyntactic behavior. Canonical demonstratives share the semantic property of expressing some type of deixis, but even here there is variability: demonstratives in many – perhaps all – languages can also convey a range of pragmatic meanings, particularly affective, discourse relational, or focusing; I return to the semantics of demonstratives below.

In Macedonian and to an extent also in Bulgarian dialects, as we have seen, the articles share both deictic and pragmatic/affective properties normally asso-

ciated with demonstratives (but with some distinctions as shown in §3.1). However, syntactically there can be no doubt that the Balkan Slavic demonstratives and articles are distinct from each other. They occupy different positions, and of course they also differ in their morphological status as full words vs. affixes. In this section I consider the syntax of the full-word demonstratives.

Demonstratives like those we are concerned with in this paper, which modify nouns, are surely located somewhere high up within the nominal projection. In early transformational grammar demonstratives were treated as determiners, that is, they occupied the same position as articles, the D head in modern parlance. This is no longer a common assumption even for English, and is clearly wrong for Bulgarian and Macedonian, whose demonstratives are visibly located above D. As early as [Arnaudova 1998](#) it was pointed out that demonstratives not only cooccur with definite article in the MD construction, they must appear above the word to which definiteness inflection attaches (40), and cannot follow a definite article (41a), (41b) or host one themselves (41c):

- (40) *tija knigite*
these books.DEF
'these books' (Bulgarian)
- (41) a. * *te tija knigi*
DEF these books
b. * *knigite tija*
books.DEF these
c. * *tijate knigi*
these.DEF books (Bulgarian)

In short, Bulgarian and Macedonian demonstratives occupy a left-peripheral position higher than the definite article within the nominal phrase. The exact identity of this position is not settled, however. It has been claimed to be SpecDP (Franks 2001, Arnaudova 1998); either SpecDP or the specifier of some higher projection, clitic phrase or a focus projection (Dimitrova-Vulchanova & Giusti 1998); the head of a demonstrative phrase above DP (Tasseva-Kurktchieva 2006); or a topic position within DP (Dimitrova-Vulchanova & Mišeska Tomić 2009), with arguments for each location at least partially dependent upon each author's theoretical assumptions. Arnaudova 1998 argues that demonstratives in Bulgarian

must raise to SpecDP from a lower position, to check referential and deictic features of D by Spec-Head agreement. A more recent treatment of demonstratives crosslinguistically, Šimík 2016, proposes that the features instantiated by demonstratives are instead split between two separate heads, Dem and D. Demonstratives always spell out the head of the DemP projection, which comprises features of relation to the context; deixis or discourse relevance. In addition, the demonstrative can also optionally spell out the D-head definiteness feature (uniqueness presupposition). I adopt the basic outlines of this proposal here;¹³ that is, I assume that in Balkan Slavic as in the languages Šimík investigates, a non-MD phrase with a demonstrative (demonstrative alone, with no article) has the structure in Figure 3. The demonstrative’s basic location and function is spelling out the Dem head, as indicated by the solid line; the dotted line indicates optionality of the demonstrative’s link to D, spelling out D features.

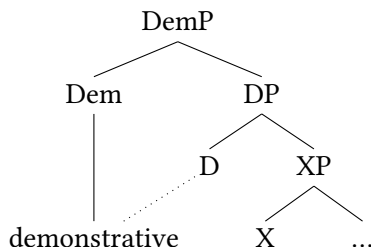


Figure 3: DP with demonstrative

This structure allows us to account for the semantics of different uses of demonstratives crosslinguistically, as Šimík demonstrates. I believe it can also capture crucial aspects of the usage of Balkan Slavic MD constructions. Before considering how MD fits into this model, a brief introduction to types of demonstratives is in order.

3.3 Canonical and pragmatic demonstratives

A canonical demonstrative includes definiteness in its meaning; it essentially has the semantics of a definite article plus some deictic, attention-focusing, or discourse-relational features. The article in (42b) makes a generic bicycle into a specific, known one. The demonstrative in (42c) does the same, but adds some additional meaning too, what Šimík defines as “establishing a relation between

¹³Šimík’s proposal is framed within the theory of nanosyntax, which I do not necessarily adopt, and his focus is on the semantics of a certain pragmatic demonstrative usage in Czech.

the denotation of the demonstrative description and an entity being pointed at (in a literal or metaphorical sense).”

- (42) a. bicycle = class, indefinite
 b. the bicycle = individuated, definite
 c. that bicycle (vs. this one) = individuated/definite but also deictic

This is captured in our analysis by the demonstrative spelling out two sets of features, those of D and those of Dem (see Šimík 2016 for fully worked-out semantics).

However, as has long been noted, many uses of demonstratives do not have the individuating function. Unlike canonical demonstratives, they can be used with proper names and other types of nouns without changing their degree of definiteness or uniqueness. They have various pragmatic functions, most commonly an affective sense, as in the following examples. Unlike (42c), (43a) does not pick out a certain bicycle but instead highlights one’s attitude toward an already-known bicycle. In (43b) *that* does not specify ‘which’ Denise, but emphasizes some quality of this intrinsically-definite proper noun. (43c) does not identify a subset of ‘your’ kids, but rather compliments all members of a situationally-definite, known group of children. The politicians in (43d) remain a generic class.

- (43) a. That bicycle is such a pain!
 b. That Denise really knows her stuff.
 c. Those kids of yours are so talented!
 d. These politicians are all liars.

In the analysis adopted here, non-canonical (pragmatic) demonstratives are those which spell out only the Dem head and not D. As Šimík 2016 states, the two semantic components which the demonstrative can spell out, the uniqueness presupposition associated with D and the relational features associated with Dem “are in principle independent of one another, making it possible for the demonstrative to spell-out either both at once (canonical use) or the relational component only (pragmatic use).”

In Bulgarian and Macedonian, as in other languages, demonstratives can be canonical or noncanonical (often affective). Unlike other languages, however, Balkan Slavic boasts a morphosyntactic correlate of affectivity, namely the MD construction. In (44a) *tozi* in a contrastive context is interpreted as a canonical demonstrative. In (44b) the meaning can be that of a canonical demonstrative

(this phone as opposed to other new iPhones) but can also be affective, commenting on a generic type of phone without further individuating it. But in (44c), with article suffix as well as demonstrative, the interpretation is necessarily affective. I suggest that this is because the demonstrative is unable to spell out the definiteness features of D, which are independently spelled out by the definite article.

- (44) a. *Tozi nov ajfon e po-skāp ot onzi.* (canonical)
 this new iPhone is more-expensive than that
 ‘This new iPhone is more expensive than that one.’
 b. *Tozi nov ajfon ne e ništo osobeno.* (canonical or affective)
 this new iPhone NEG is nothing special
 ‘This new iPhone is nothing special.’
 c. *Tozi novija ajfon ne e ništo osobeno.* (affective only)
 this new.DEF iPhone NEG is nothing special
 ‘This new iPhone (i.e. new iPhones in general) is nothing special.’
 (Bulgarian)

To summarize, the analysis I adopt for Balkan Slavic demonstratives comprises the following main points: the demonstrative heads DemP (spells out features of Dem head), and can optionally also spell out features of the D head. When a demonstrative simultaneously spells out both Dem and D heads this gives the canonical demonstrative reading in which the demonstrative expresses features of definiteness. When only the Dem head is spelled out, the resulting reading is one of a non-canonical demonstrative, specifically affective. The latter reading is obligatory when the D head is spelled out separately as the definite article suffix.

3.4 Putting it together: Interaction of demonstrative and article

If the conclusions of the previous section are correct, demonstratives in Balkan Slavic interact with the D head in several different ways. These interactions are shown in the following three trees, which correspond to the examples in (44).

Figure 4 represents the phrase *tozi nov ajfon* ‘this new iPhone’ in (44a), with canonical demonstrative spelling out features of both Dem and D heads.

Figure 5 represents the phrase *tozi nov ajfon* ‘this new iPhone’ in (44b), where the demonstrative spells out only Dem features, not D, resulting in affective interpretation. The D head here is represented as null, but could also simply be absent; i.e. DP might not be projected.

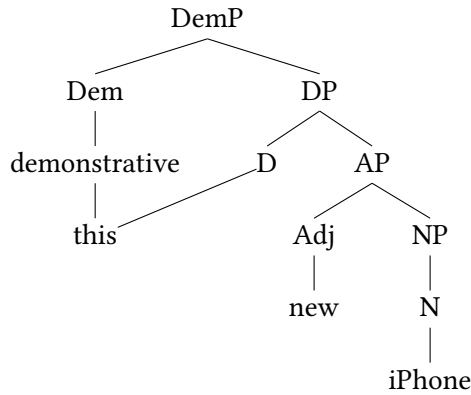


Figure 4: Canonical demonstrative

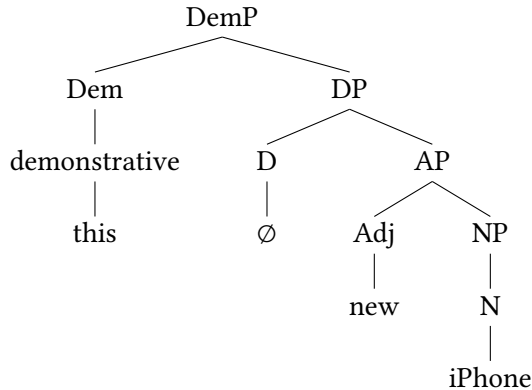


Figure 5: Affective demonstrative

Figure 6 represents the phrase *tozi novija ajfon* ‘this new.DEF iPhone’ in (44c), the MD construction. As in Figure 5, the demonstrative spells out only Dem features, not D and is affective. The difference is that the D head in Figure 6 is not null but spelled out as the article (definiteness inflection).

The structure of the Balkan Slavic MD construction in general is then Figure 7. Both demonstrative and article appear as overt lexical material. The demonstrative spells out only the relational features located in the Dem head, not any features related to D. The D features are spelled out separately, as the definite article suffix on the following head, and definiteness agreement can spread optionally to the following head(s).

Šimik 2016 suggests that demonstrative and article should not both be able to be spelled out, clearly counter to the Balkan Slavic facts. In footnote 9 of his arti-

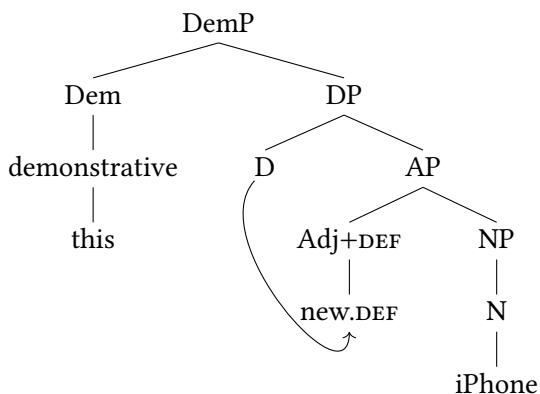


Figure 6: (Affective) demonstrative in MD phrase

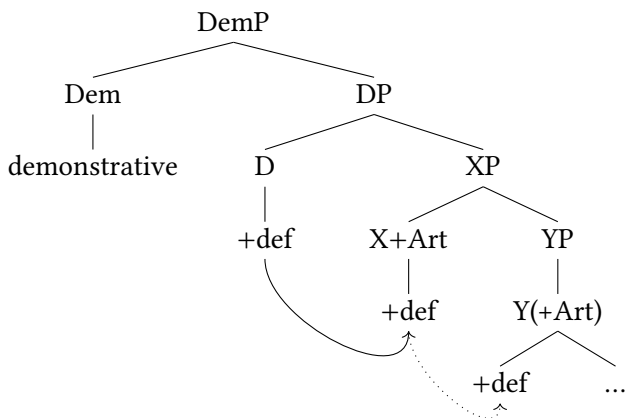


Figure 7: MD construction: DP with demonstrative and DEF

cle he speculates that something like *that the* could be blocked by general principles which require the fewest possible spellouts: since *that* can spell out features of both heads, *the* cannot be spelled out. Deeper investigation is required, obviously, to make any sweeping claims about what makes MD constructions with demonstrative + article possible crosslinguistically. But it is at least a plausible conjecture that the reason Balkan Slavic languages are able to spell out both demonstrative and article is precisely that the article is realized as a suffix on a later word, that is, that the demonstrative and article are nonadjacent and thus cannot be spelled out as a single lexical item.

Within the system of Šimik 2016, nominals with affective (and other noncanon-

ical) demonstratives have no D and thus none of the definiteness or uniqueness features associated with D. This does not seem to be the case in the Balkan Slavic MD construction, however. In fact, I suggest the characteristic meaning of the MD construction derives from a combination of the semantics of demonstratives with that of definiteness (or perhaps specificity or uniqueness).¹⁴ In Bulgarian and Macedonian a phrase with only a demonstrative, as in (45a), usually has the canonical, deictic demonstrative sense, including of course a presumption of uniqueness (definiteness): this particular cake as opposed to others. In the MD construction (45b), with demonstrative and definite article, the demonstrative is affective, contributing subjective, evaluative focus on some qualities of the cake. However, there is still a presumption of uniqueness; the “awesome” cake is a particular, situationally definite cake, a meaning underlined by the definite article.

- (45) a. *Tazi nejna torta e naj-vkusnata.*
 this her cake is most-delicious.DEF
 ‘This cake of hers is the most delicious one.’
 b. *Tazi nejnata torta e straxotna!*
 this her.DEF cake is awesome
 ‘That cake of hers is awesome!’ (Bulgarian)

In attested MD examples the nominals are similarly individuated: (46) comments on specific known “morons”, with *ovie* adding evaluative nuance; (47) pokes fun at four known, definite robbers. *Onija četirima*, with no article, could mean ‘those four’ as opposed to other people, but the MD construction *onija četirimata* means four already identified people, with the demonstrative adding affectivity rather than specifying which four.

- (46) *Ovie moronive me prašuvaa za ova.*
 those morons.DEF me asked about that
 ‘Those morons were asking me about that.’ (Macedonian; Prizma 2015)

 (47) *onija četirimata šašavi razbojnici*
 those four.DEF foolish robbers
 ‘those four foolish robbers’ (Bulgarian; Roman Dimitrov *Decata na Perun*)

¹⁴This may in fact be true of affectives in general. Definiteness is not morphologically overt in the English examples in (43) but is nonetheless present: the bicycle, the kids, and Denise are situationally definite, known, and specific in the discourse context. We might speculate that this type of definiteness in English inheres in the NP itself or is pragmatically inferred, rather than being marked by D features, whereas in Bulgarian and Macedonian it is overtly marked.

Demonstratives always have an attention-focusing function, pointing or marking as discourse-relevant. With an otherwise non-definite nominal, this attention-focusing takes the form of specifying: picking out a specific item or subset. When paired with an already-specific, definite nominal, this specifying focus would make no sense; when the demonstrative occurs with a proper name or other intrinsically definite noun, or with a definite article, it must spell out only relational features (features of Dem), not definiteness. In this situation, the demonstrative focuses attention on something like unique qualities of the individual or group. Thus the MD construction in Balkan Slavic is not mere definiteness agreement. The demonstrative and the definite article each make a separate semantic contribution. The demonstrative spells out relational features, and the +definite feature of D is manifested as overt definiteness agreement; the combination gives the characteristic affective reading of MD. The association is not limited to Balkan Slavic: affective or otherwise pragmatic interpretation of demonstrative with a (situationally or morphologically) definite or specific nominal, including proper names, is extremely robust crosslinguistically.

3.5 How is Bulgarian different from Macedonian?

One remaining loose end is the fact, noted in §2.3, that the two Balkan Slavic languages' MD constructions differ in whether nouns can carry the definite article, with or without a preceding adjective or other modifier. 'Book' can have definite inflection in Macedonian (48) but not Bulgarian (49).

- (48) a. *ovaa knjigava*
 this book.DEF
 'this book'
- b. *ovaa tvojava / interesnava knjigava*
 this your.DEF interesting.DEF book.DEF
 'this book of yours / this interesting book' (Macedonian)

- (49) a. *taja kniga(*ta)*
 this book.DEF
 'this book'
- b. *taja tvojata / interesnata kniga(*ta)*
 this your.DEF interesting.DEF book.DEF
 'this book of yours / this interesting book' (Bulgarian)

Given the analysis of the definite article suffix as agreement, the difference is how far down into the nominal phrase definiteness agreement is able to penetrate: in both Bulgarian and Macedonian the heads of QP, PossP, and one or more AP can take the definite article suffix in MD constructions, but only in Macedonian can agreement reach into NP and mark the head N. One possible explanation could involve a difference in nominal structure posited by Franks (2015) for independent reasons; an additional Agr¹⁵ layer in Bulgarian but not Macedonian:

- (50) a. Macedonian DP: [DP [QP [PossP [AP [NP]]]]]
 b. Bulgarian DP: [DP [QP [PossP [AP [AgrP [NP]]]]]]

This additional projection allows for a possessive (dative) clitic within the nominal phrase. Both Bulgarian and Macedonian allow possessive adjectives with the definite article suffix, including in the MD construction with a demonstrative (51). In Bulgarian the possessive can be a clitic (Agr head), including in MD (52). In Macedonian, which lacks AgrP, a possessive clitic is impossible (53).

- (51) a. *moite knigi / tija moite knigi*
 my.DEF books these my.DEF books
 ‘my books / these books of mine’ (Bulgarian)
 b. *moive knigi / ovie moive knigi*
 my.DEF books these my.DEF books
 ‘my books / these books of mine’ (Macedonian)

- (52) a. *knigite mi*
 books.DEF my
 ‘my books’
 b. *tija novite mi knigi*
 these new.DEF my books
 ‘these new books of mine’ (Bulgarian)

- (53) a. **knigive mi*
 books.DEF my

¹⁵In some versions of his work on this topic Franks calls this projection KP, in others AgrP. Agr seems like a better label, given that the items which head it are pronominal clitics with person and number features.

- b. * *ovie novive mi knigi* (Macedonian)
 these new.DEF my books

It is tempting to suggest that the AgrP layer also insulates NP from agreement-spreading in MD, as the head of Agr constitutes a non-agreeing, intervening head between N and the preceding definite-marked element. The correlation of possessive clitic and ability for nouns to be articulated in MD construction is supported by facts of another Balkan language, Albanian, whose MD constructions share nearly all the properties of MD in Balkan Slavic. Like Macedonian, Albanian allows a definite article suffix on nouns in MD phrases, as in (54), and lacks DP-internal possessive clitic, suggesting that it, like Macedonian, has no AgrP projection above NP.

- (54) *ky djali*
 this boy.DEF
 ‘this boy’ (Albanian)

However, there is one major problem with idea of AgrP blocking definiteness agreement into NP in Bulgarian. Outside of the MD construction, Bulgarian nouns do of course allow the definite article suffix; simple nouns like *knigite* ‘the book’ are found in many examples in this paper. Blocking definite inflection on simple nouns is clearly not a desirable result. It remains to be seen whether a more nuanced treatment of the structure of NP and Agr in Bulgarian vs. Macedonian (and Albanian) can account for the difference in definiteness marking in nouns inside and outside MD constructions.

4 Conclusions and remaining problems

This paper investigates the colloquial Bulgarian and Macedonian multiple determination construction containing both a demonstrative and a definite article. The construction is a single nominal phrase with demonstrative heading DemP (spelling out features of the Dem head) and the article spelling out features of D, realized as a suffix on the next phrasal head: PossP, QP, AP, or in Macedonian NP. Semantically, the Balkan Slavic MD construction has an affective interpretation. This meaning is derived from the interaction of demonstratives and the definite article in these languages: since the D head is independently spelled out by the article, the demonstrative spells out only the relational features associated with Dem and has no definiteness features. Independent spell-out of D in addition to Dem is, I suggest, made possible by the non-adjacency of the article suffix and

the demonstrative. The emotive quality of MD accounts for its preference for colloquial and proximate demonstratives and articles.

Problems remain, obviously. One mystery already discussed is how to account for the failure of nouns to take a definite article in Bulgarian MD, unlike in normal DPs. In fact, definiteness inflection in MD differs in two ways from that in definite DP with no demonstrative: in addition to the inability to reach N in Bulgarian, there is also the phenomenon of multiple agreement. It is not very clear why agreement spreading (multiple articles) occurs only in the MD construction and not in other DPs. There are several possible lines of attack on this problem. One is conditioned agreement: it could be the demonstrative's feature that probes and the definiteness feature is valued as a free-rider. Another is conditioned realization of overt agreement by the presence of an additional feature, perhaps formalized through an agree-link account following [Arregi & Nevins 2012; 2013](#). A third is an association with focus; agreement spreading only to focused items could account for the multiple agreement facts if more projections can be focused in MD. Finally, it is possible that the multiple-article cases actually contain multiple DPs. I leave sorting out the solution for future research.

Balkan Slavic MD constructions provide insight into several aspects of the structure of DP in these languages. They provide support for treating demonstratives as specifiers of DemP, for the inflectional status of the Balkan definite articles, and for a more elaborated DP structure in Bulgarian than Macedonian, perhaps involving an extra projection above NP. The semantic effect of combining a demonstrative with a definite DP, namely an affective focus on qualities of an already-specified individual or group, may hold across languages, even universally. Overt realization of the article along with the demonstrative is likely to depend on their being non-adjacent, preventing the demonstrative from simply spelling out the features of both Dem and D. All of these results (and questions) provide a basis for further cross-linguistic investigation of MD constructions.

Abbreviations

1	first person	N	neuter
2	second person	NEUT	neutral
3	third person	PL	plural
DEF	definite	PROX	proximal
DIST	distal	REFL	reflexive
F	feminine	SG	singular
M	masculine		

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Chapter 13

Definiteness in the absence of uniqueness: The case of Russian

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This paper is devoted to the study of the interpretation of bare nominals in Russian, revisiting the issues related to their perceived definiteness or indefiniteness. We review the linguistic means of expressing definiteness in Russian, showing that none of them is sufficient to encode this meaning. Taking the uniqueness approach to definiteness as a point of departure, we explore the differences in the interpretation of definite NPs in English and in Russian, arguing that Russian bare nominals do not give rise to the presupposition of uniqueness. The perceived definiteness in Russian is analysed as a pragmatic effect (not as a result of a covert type-shift), which has the following sources: ontological uniqueness, topicality, and familiarity/anaphoricity.

Keywords: definiteness, uniqueness, articleless languages, Russian

1 Introduction

The category of definiteness is mostly discussed in the literature in relation to languages with articles. Russian, however, does not possess an article system, like most Slavic languages, except for Bulgarian and Macedonian that have a postpositive affix to mark definiteness. Cross-linguistically, it is not uncommon for languages to lack articles (Lyons 1999; Dryer 2013; i.a.), and yet, the semantic properties of nominal phrases in such languages have not been clearly determined yet. This article makes a contribution to the discussion of referential properties



of bare nominals in Russian as a representative of languages without articles, as well as the concepts that are associated with definiteness cross-linguistically.

In order to achieve a better understanding of the category of definiteness and the concepts related to it in articleless languages, we look at lexical, grammatical, syntactic, and prosodic means that contribute to a perceived definite interpretation of bare nominals in Russian (§2). Then, we compare the interpretation of definite NPs in languages with articles and in languages without articles. We show that, unlike English NPs with a definite article, Russian NPs, perceived as definite, lack the presupposition of uniqueness (§3). On the basis of the empirical discussion in §3, we propose that bare nominals in Russian are semantically indefinite (see Heim 2011) and definiteness in Russian is a pragmatic effect, thus, it is not derived by a covert type-shift (contra a long-standing assumption in the formal linguistic literature, e.g. Chierchia 1998), but is a result of pragmatic strengthening. We suggest that there are at least three sources of the perceived definiteness in Russian: ontological (or situational) uniqueness, topicality, and familiarity/anaphoricity (§4).

Our discussion in this paper is limited to Russian and we do not make any claims about the interpretation of bare nominals in other articleless languages. However, in the future this proposal can be tested against the data and possibly extended to other languages, which will contribute to our understanding of definiteness as a universal phenomenon.

2 Definiteness without articles

The distinction between definite and indefinite reference is often assumed to be an important element of human communication, therefore, it is natural to expect it to be universally present in natural languages, regardless of whether they have lexical articles (Brun 2001; Zlatić 2014; i.a.).

Looking at Russian one can see that, even though this language does not express definiteness as a binary grammatical category [\pm definite] in a strict sense, the values of definiteness and indefiniteness appear to be perceptible to its speakers. The English translation of the Russian examples in (1) reveals the difference in the interpretation of the bare nominal, whose morphological form (the nominative case) and syntactic function (the subject) stay the same, even though the linear word order is altered.¹

¹All examples in the paper are from Russian or English, unless indicated otherwise.

- (1) a. *V uglu spit koška.*
 in corner.LOC sleeps cat.NOM
 ‘A cat is sleeping in the corner.’ / ‘There is a cat sleeping in the corner.’
 b. *Koška spit v uglu.*
 cat.NOM sleeps in corner.LOC
 ‘The cat is sleeping in the corner.’

In (1a) the interpretation of the subject nominal *koška* seems to be equivalent to the English expression *a cat*, which has an indefinite interpretation, while in (1b) it is rather comparable to the definite description *the cat*, thus, the contrast between a definite and an indefinite interpretation seems to be expressible in Russian. An important question that immediately arises in this respect is how these readings are encoded in the absence of articles.

In the linguistic literature it has been generally assumed that, even though languages like Russian do not have a straightforward way of expressing (in)definiteness, this semantic category would still be present in the language and there would be certain means to express it (Galkina-Fedoruk 1963; Pospelov 1970; i.a). In particular, it has been claimed that in order to encode the values of (in)definiteness, Russian speakers use a number of strategies, which include lexical, morphological, syntactic, and prosodic means, as well as their combination. In the following subsections we show how these strategies are implemented in Russian.

2.1 Lexical means

Russian has a number of lexical elements that determine the referential status of a nominal in the most straightforward way; these include demonstrative pronouns, determiners, quantifiers. Padučeva (1985) calls such elements “actualizers” as they mark or indicate the referential status of a bare noun, as illustrated in (2b). While unmodified bare nominals may have various interpretations, as indicated in the English translation of (2a), NPs modified by an adjective of order (a superlative, an ordinal, *poslednij* ‘last’, *sledujuščij* ‘next’, etc.) or by a complement establishing uniqueness (PP, relative clause, genitive attribute) will be construed as definite, as illustrated in (2c).

- (2) a. *Rebēnok pel pesnju.*
 child.NOM sang song.ACC
 ‘The/a child sang the/a song.’
 b. *Tot rebēnok pel kakuju-to pesnju.*
 that child.NOM sang some song.ACC
 ‘That child sang some song.’

- c. *Samyj mladšij rebënok sestry pel pesnju, kotoruju ona*
 most young child.NOM sister.GEN sang song.ACC that she
sama sočnila.
 herself composed
 ‘My sister’s youngest child sang the song that she had composed.’

Nevertheless, the use of actualizers is optional in Russian, so the speakers cannot truly rely on their presence and therefore have to use other strategies to encode and decode the referential status of a nominal expression.

2.2 Morphological means

Apart from lexical means, Russian and other Slavic languages use morphological tools to encode the reference of a nominal phrase. The two grammatical categories that may affect the definiteness status of a bare nominal in direct object position are the aspect of the verbal predicate and the case of the nominal itself.

Aspect (perfective or imperfective) in Russian is a grammatical category, obligatorily present on the verb, and generally expressed by verbal morphology. Any given verb belongs to one of the two aspects, however, there is no uniform morphological marker of aspect in Russian (Klein 1995; Borik 2006).² The relation between perfectivity of the verbal predicate and the interpretation of its direct object in Slavic languages has been widely discussed in the literature (Wierzbicka 1967; Krifka 1992; Schoorlemmer 1995; Verkuyl 1999; Filip 1993; i.a.).

Let us look at some examples. In (2) the direct object of a perfective verb is interpreted definitely, while the direct object of an imperfective verb in (4) may be interpreted definitely or indefinitely, depending on the context.³

²There is a relatively small class of biaspectual verbs whose aspectual value can only be established in context.

³The correlation between the verbal aspect and the interpretation of the direct object is clearly present in other Slavic languages, e.g. in Bulgarian, which has an overt definite article. The following example shows that at least in some cases, the definite article cannot be omitted if the verb is perfective.

- (i) a. *Ivan pi vino.*
 Ivan drank.IPFV wine.ACC
 ‘Ivan drank / was drinking wine.’
 b. *Ivan izpi vino*(-to).*
 Ivan drank.PFV wine.ACC-DEF
 ‘Ivan drank the wine.’

(Bulgarian; Dimitrova-Vulchanova 2012: 944)

- (3) *Vasja s"el jabloki.*
Vasja ate.PFV apples.ACC
‘Vasja ate the apples.’
- (4) *Vasja el jabloki.*
Vasja ate.IPFV apples.ACC
‘Vasja ate / was eating (the) apples.’

It is possible to get an indefinite interpretation of the object in combination with a perfective verb, like in (2); in order to do so, the case of the nominal has to be changed from the accusative into the genitive and, thus, the object gets interpreted as partitive (5).

- (5) *Vasja s"el jablok.*
Vasja ate.PFV apples.GEN
‘Vasja ate some apples.’

This kind of case alternation can be considered a morphological means of encoding indefiniteness. It should be noted, however, that case alternations are restricted to inanimate plural and mass objects, and due to this restriction, the effects of the case alternation cannot be considered strong enough to postulate a strict correspondence between the case of the direct object and its interpretation.⁴

Moreover, as claimed in Czardybon (2017), only a certain lexical class of perfective verbs, i.e., incremental theme verbs, such as *eat*, *drink*, *mow*, etc. trigger a definite reading of a bare plural or a mass term in Slavic languages.⁵ The phenomenon is explained in Filip (2005: 134–136), where she posits that arguments of perfective incremental theme verbs “must refer to totalities of objects” falling under their descriptions and that “such maximal objects are unique”, thus, have a definite referential interpretation.

⁴Other languages, such as Turkish, Persian (Comrie 1981) or Sakha (Baker 2015), seem to exhibit a really strong correlation between case marking and interpretation of the nominal, especially in direct object position.

⁵The term “incremental theme verb” was introduced by Dowty (1991), following Krifka’s (1989) distinction of a “gradual patient” (of verbs, like *eat*) and a “simultaneous patient” (of verbs, like *see*). There are three types of incremental theme verbs: (i) verbs of consumption (*eat*, *drink*, *smoke*), (ii) verbs of creation/destruction (*build*, *write*, *burn*, *destroy*), and (iii) verbs of performance (*sing*, *read*).

2.3 Syntactic means

Another strategy of (in)definiteness-encoding in Russian extensively described in the literature (Pospelov 1970; Fursenko 1970; Chvany 1973; i.a.) is the linear word order alternation: preverbal subjects are interpreted definitely and postverbal ones, indefinitely. This kind of observation is made over sentences containing intransitive verbal predicates. Examples (8) and (9) are modelled on Krámský's (1972: 42) examples from Czech.

- (6) a. *Kniga ležit na stole.*
book.NOM lies on table.LOC
'The book is on the table.'
- b. *Na stole ležit kniga.*
on table.LOC lies book.NOM
'There is a book on the table.'

Such a pattern, observed in Russian, where the preverbal subject is interpreted as definite and the postverbal subject as indefinite, has been claimed to be universal (Leiss 2007).⁶ A similar correlation between distribution and interpretation has been reported for other articleless languages, such as Mandarin Chinese, where preverbal bare nominals are interpreted only as generic or definite, while postverbal bare nominals can be interpreted as either indefinite or definite or generic (Cheng & Sybesma 2014).

However, perceived definiteness of the preverbal subject may depend on the information structure of the sentence, i.e., topicality of the subject. As the change in the linear constituent order is not conditioned by the change of the corresponding syntactic function (subject vs. object) in Russian, many researchers suggest that word order alternations are determined by information structure (Mathesius 1964; Sgall 1972; Hajičová 1974; Isačenko 1976; Yokoyama 1986; Comrie 1981; i.a.). The subject in (8) is in topic position, expressing given (discourse old) information, while the subject in (9) is the focus, containing discourse new information.⁷ Apparently, topicality strongly increases the probability of a definite reading of

⁶It has been also argued (Šimík & Burianová 2020) that definiteness of bare nominals in Slavic is affected not by the relative (i.e., preverbal vs. postverbal) position of this nominal in a clause, but by the absolute (i.e., clause initial vs. clause final) position.

⁷We assume that the leftmost/preverbal position is reserved for topics in Russian (Geist 2010; Jasinskaja 2016).

a bare NP. Many researchers have claimed that elements appearing in topic position can only be referential, i.e., definite or specific indefinite (see Reinhardt 1981; Erteschik-Shir 1998; Portner & Yabushita 2001; Endriss 2009).⁸

Experimental studies which explore the phenomenon of linear position alternation for bare subjects of intransitive verbs in Slavic languages have also shown that topicality is not always sufficient for definiteness. The studies by Šimík (2014) on Czech, Czardybon et al. (2014) on Polish, and Borik et al. (2020) and Seres et al. (2019) on Russian have shown that there is no clear one-to-one correspondence between the syntactic position of the nominal and its interpretation, there is only a preference.

Thus, the linear position of a bare subject cannot be considered sufficient for determining its type of reference, moreover, this condition may be overridden by the use of prosody, as we show below.

2.4 Prosodic means

Another means of encoding reference that should not be underestimated is prosody. Correlating with information structure, prosody may influence the interpretation, e.g. the constituent carrying the nuclear accent may indicate a contrastive topic. The examples below show how the change in the sentential stress pattern may override the effect of the word order alternation. In (11) and (13) the intonation is neutral, i.e., the stress is on the last phonological word).⁹

- (7) *Poezd* *PRIŠĚL*.
train.NOM arrived
'The train arrived.'

- (8) *POEZD* *prišěl*.
train.NOM arrived
'A train arrived.'

- (9) *Prišěl* *POEZD*.
arrived train.NOM
'A train arrived.'

⁸However, this is not always the case. As suggested by Leonetti (2010), non-specific or weak indefinites may also appear in topic position under certain conditions, i.e., when they are licensed by certain kinds of contrast or when they are licensed in the sentential context with which the topic is linked.

⁹Capital letters represent sentence stress. The examples are taken from Pospelov (1970: 185, examples 1–4).

- (10) *PRIŠĚL poezd.*
arrived train.NOM
'The train arrived.'

It can be seen that the nominal in (12), although preverbal, may be interpreted indefinitely as novel information if it receives prosodic prominence (a nuclear accent), while the constituent that lacks this prominence is interpreted as given information.¹⁰

As has been shown in this section, Russian bare nominals may acquire a definite interpretation through several lexical, grammatical, syntactic, and prosodic means or a combination thereof. None of these means is strong enough, though, to encode definiteness in all possible cases.

3 The meaning of definiteness in languages with and without articles

In the previous sections, we have seen that under certain conditions Russian bare nominals can be interpreted as definite, or, at least, perceived as equivalent to English nominals with a definite article. But how feasible is it to assume that what we perceive as a definite bare nominal in Russian is semantically equivalent to a definite nominal in English or other languages with articles? This is the question we address below.

In this section we are going to argue that what is understood by “definiteness” in languages with an article system might be rather different from what is found in Russian. In particular, we adopt a so-called uniqueness theory of definiteness as a point of departure and argue that, unlike in English or other languages with articles, there is no uniqueness/maximality presupposition in Russian bare nominals that are perceived as definites. This claim is in accordance with the classical view (Partee 1987) that uniqueness/maximality is something that is actually associated with or contributed by the definite article itself, and not by an iota operator, as proposed by Chierchia (1998), Dayal (2004), or Coppock & Beaver (2015).

In order to sustain our hypothesis about the lack of uniqueness/maximality in nominals perceived as definites in Russian, we are going to first review the uniqueness theory of definiteness and then provide empirical support for the claim that Russian bare nominals do not bear any uniqueness presupposition.

¹⁰See Jasinskaja (2016) for more details on deaccentuation of given information.

3.1 What is definiteness?

To begin with, let us look at English, where definiteness is expressed by means of articles. Definite NPs have various uses, the most typical of which are the following: situational definites (22), anaphoric definites (16), cases of bridging (Clark 1975) (17), and weak definites (18).¹¹

- (11) It's so hot in the room. Open the door!
- (12) I saw a man in the street. The man was tall and slim.
- (13) I'm reading an interesting book. The author is Russian.
- (14) Every morning I listen to the radio.

There have been many approaches to definiteness in linguistics starting from Frege (1892). A widely accepted view on definiteness in the formal semantic literature is based on the so-called theory of uniqueness. Singular definite descriptions show the property of uniqueness (Russell 1905), which is considered to be part of the presupposition associated with definite nominals (Frege 1879; Strawson 1950). For instance, if we compare an indefinite NP in (15a) with a definite one in (15b), it is clear that (15b) is about a contextually unique mouse, while (15a) may have more than one possible referent.

- (15) a. I've just heard a mouse squeak.
- b. I've just heard the mouse squeak.

Uniqueness presupposes the existence of exactly one entity in the extension of the NP that satisfies the descriptive content of this NP in a given context, therefore, uniqueness entails existence.¹² Thus, Russell's (1905) famous example *The king of France is bald* can be interpreted as neither true nor false, as there is no such entity that would (in our world and relative to the present) satisfy the description of being the king of France, but the existence and the uniqueness of the king of France are still presupposed in this example.

The semantic definiteness in argument position is standardly associated with the semantic contribution of the definite article itself, formally represented by the

¹¹In the case of weak definites, there is no requirement for the definite DP to have a single referent. Aguilar-Guevara & Zwarts (2011) treat weak definites as kind nominals.

¹²With the notable exception of Coppock & Beaver's (2015) proposal.

ι (iota) operator. The iota operator shifts the denotation of a common noun from type $\langle e, t \rangle$ to type e , i.e., from a predicate type to an argument type (see Heim 2011: 998), and thus, denotes a function from predicates to individuals (Frege 1879; Elbourne 2005; 2013; Heim 2011).¹³ The meaning of the definite article can be represented as in (19).

- (16) $\llbracket \text{the} \rrbracket = \lambda P : \exists x. \forall y [P(y) \leftrightarrow x = y]. \iota x. P(x)$,
where ιx abbreviates ‘the unique x such that’.

Plural definite NPs naturally violate the presupposition of uniqueness. In this case uniqueness is reformulated as maximality (Sharvy 1980; Link 1983), i.e., reference to a maximal individual in the domain, which is picked out by the definite article.

The above-mentioned concepts related to definiteness (i.e., uniqueness, existence, maximality) have all been postulated in relation to languages with articles and therefore are associated with the presence of the definite article on the nominal. The relevant question that arises when one analyses languages without articles is whether the expressions perceived as definite in such languages would give rise to the same effects as the ones found in languages with articles.

From a theoretical perspective, there are two possible answers to this question. The first one is to attribute definiteness effects to the presence of the article itself. In this case, the uniqueness of definite descriptions will follow directly from the semantics of the definite article, as in classical uniqueness/type-shifting theories (e.g., Frege 1892; Partee 1987). We expect that languages without articles do not show the same type of definiteness effects as languages with overt articles, simply because the former do not have any lexical element that would make the same semantic contribution as a definite article.¹⁴

Another option is to follow Chierchia (1998) and Dayal (2004) and claim that articleless languages use the same inventory of type shifting operators with the only difference that these operators are not lexicalized. Should the iota operator be responsible for deriving a definite interpretation of nominal arguments in Russian, the predictions are clear: the uniqueness effects associated with definite descriptions in English should also exist in Russian. However, the empirical facts that we discuss in the next section seem to indicate that the perceived definiteness in Russian does not give rise to the same semantic effects as in English, which, in principle, argues against the Chierchia/Dayal type of analysis.

¹³Predicative uses of definites also exist. They can either be derived from argumental ones (Partee 1987; Winter 2001) or taken as basic ones (Graff Fara 2001; Coppock & Beaver 2015).

¹⁴This approach is fully compatible with the indefiniteness hypothesis that we present in §4.

As a side note, we would like to emphasize that we do not associate the iota operator with any particular syntactic projection or any particular syntactic head. Thus, the question about a possible syntactic structure of referential bare nominals in Russian and, in particular, the presence or absence of the D-layer, is not straightforwardly connected to whether or not a language employs a certain semantic operator to derive its arguments. An iota operator, should it exist, does not entail any syntactic projection, because the function of this operator (namely, to derive expressions of type *e*) is semantically defined and whether or not all expressions of this type should have the same syntactic structure associated with them across languages or within a language is an independent question.

3.2 Uniqueness in English vs. Russian

Let us now compare two sets of matching empirical data from English and Russian and see whether the same semantic definiteness effects emerge in both languages in the case of nominals which are either marked (English) or perceived (Russian) as definite.

- (17) The director of our school appeared in a public show. #The other /
#Another director (of our school)...
- (18) A director of our school appeared in a public show. Another director (of
our school)...

Let us first look at (21). The subject of the first sentence is definite: it is marked by a definite article, semantically derived by the *ι* operator and has a strong uniqueness presupposition that cannot be cancelled, as witnessed by the unacceptability of the suggested continuations. The only possible interpretation of the second sentence in (21) would be ‘the other director of the other school’, which would not violate the presupposition of uniqueness of the definite description ‘the director of our school’ in the first sentence. However, any continuation with ‘our school’ in the second part of (21) is impossible.

In (22), on the other hand, the first subject is indefinite and does not give rise to any uniqueness effects. In this case, as the example illustrates, it is possible to conceive the interpretation ‘another director of the same school’, even though it might sound pragmatically unusual. The two examples thus clearly illustrate the effects created by the uniqueness presupposition of a definite description.

Now let us have a look at similar data from Russian. To narrow down our empirical coverage, we only look at singular bare preverbal subjects in this paper,

considering them strong candidates for definite nominals, due to their position and a default definite-like interpretation that they receive in native speakers' judgements.

- (19) a. *Direktor našej školy pojavilsja v tok-šou.*
 director.NOM our school.GEN appeared in talkshow
 'The director of our school appeared in a talkshow.'
- b. *Drugoj direktor (našej školy) vystupil na radio.*
 other director.NOM our school.GEN spoke on radio.LOC
 'The other director (of our school) spoke on the radio.'

The Russian example (19a) taken in isolation seems to be equivalent to the first part of the English example in (21), in the sense that the nominal phrase '(the) director of our school' in both cases is interpreted as definite and, thus, the default interpretation is 'the unique director' in both languages. However, is this interpretation semantically encoded in both languages? Given the theory of uniqueness, if what appears to be a definite nominal in Russian is also associated with the uniqueness presupposition, just like a definite description in English, the effects of violating this presupposition should be comparable to those observed in the English example (21). Should we find the same type of uniqueness effects both in English and in Russian, we can conclude that the same semantic operator, namely, an iota operator, is responsible for deriving definiteness in both languages. In search of an answer, we turn to (19b).

Crucially, we observe a substantial difference in the interpretation of example (21) on the one hand, and example (23), on the other hand. In particular, the subject in (19b) can be interpreted as 'another director of the same school', as opposed to the English example in (21). This means that there seems to be no uniqueness presupposition associated with the subject 'director of our school' in (19a).¹⁵ Examples (24) and (25) show the same effect, i.e., there seems to be no uniqueness presupposition associated with bare nominals that are perceived as definite. In the examples below, the judgments are given for 'another doctor of the same patient' and 'another author of the same essay', respectively.

- (20) a. *Vrač prišel tol'ko k večeru. Drugoj vrač prosto*
 doctor.NOM came only to evening other doctor.NOM simply

¹⁵In this paper we rely on our own judgements. A reviewer points out that the data we discuss should be tested experimentally and we completely agree with this remark. In fact, this is the next step on our research agenda.

pozvonil.

called

‘Doctor came only towards the evening. Other doctor simply called.’

- b. The doctor came only towards the evening. #The other doctor simply called.

- (21) a. *Avtor étego očerka polučil Pulitzerovskuju premiju.*
author.NOM this essay.GEN received Pulitzer prize.ACC

Drugoj avtor daže ne byl upomjanut.

other author.NOM even not was mentioned

‘Author of this essay got a Pulitzer prize. Other author was not even mentioned.’

- b. The author of this essay got a Pulitzer prize. #The other author was not even mentioned.

Taking into consideration the English and Russian data discussed in this section, we can conclude that the mechanism that yields a definite interpretation for bare nominals in Russian is crucially different from the mechanism that derives definiteness in English. If both definite descriptions in English and bare singulars in Russian perceived as definites were derived by the same semantic operation, we would expect the same semantic effects associated with definite expressions in both languages. The data, however, show that uniqueness effects are, indeed, very prominent with definite nominals in English, but seem to be absent in Russian.¹⁶ This means that what we call a “definite interpretation” in Russian is of a different nature. Unlike in (21), there is no violation of the presupposition of uniqueness in the Russian examples discussed in this section. Rather, the effect found in (23)–(25) is comparable to cancelling an implicature.

A real presupposition violation can be illustrated by the following examples with factive predicates (*know*, *be glad*, etc.). The continuations in (22) and (23) are clearly unacceptable, whereas in the examples (23)–(25) above only some pragmatic adjustment is required.

¹⁶ An anonymous reviewer suggests that if presupposition is considered a pragmatic phenomenon, it should be possible to (easily) cancel it. This, according to the reviewer, would mean that *director* in (19a) does have a presupposition of uniqueness, unless (19b) is added. We still think that our argument stands: whether presupposition is a semantic or a pragmatic phenomenon, it should behave in a uniform way, independently of the language. The fact that it cannot be cancelled in English but can in Russian means (to us) that, if we are dealing with uniqueness presupposition in the case of English, Russian should be treated differently.

- (22) *Tolja znaet, što Anja zavalila ékzamen. #Ona polučila*
Tolja.NOM knows that Anja.NOM failed exam.ACC she got
otlično.
excellent.
'Tolja knows that Anja failed her exam. She got an 'excellent''
- (23) *Tolja ne znaet, što Anja zavalila ékzamen. #Ona polučila*
Tolja.NOM not knows that Anja.NOM failed exam.ACC she got
otlično.
excellent.
'Tolja doesn't know that Anja failed her exam. She got an 'excellent''

The absence of uniqueness/maximality in Russian bare nominals has also received empirical evidence in a recent experimental study by Šimík & Demian (2020), who have found that there is no uniqueness/maximality for bare nominals in sentence-initial position, which is generally associated with topicality (Geist 2010 i.a.). Bare singulars behave rather as indefinites, which is in line with Heim's (2011) hypothesis about the default interpretation of bare nominals in articleless languages, the proposal we discuss right below. Bare plurals show some maximality effects, which, however, are rather weak and are probably related to pragmatic exhaustivity, construed as a conversational implicature.

4 "Definiteness effects" in languages with and without articles

4.1 An indefiniteness hypothesis: Heim (2011)

In this section we briefly present an indefiniteness hypothesis based on Heim (2011) and discuss its repercussions for languages without articles. We suggest that this hypothesis can straightforwardly account for the data discussed in the previous section and that it makes the right predictions for the interpretative possibilities of bare nominals in languages without articles. We will keep the discussion at a rather informal level for the purposes of this paper, acknowledging the need to develop a formal analysis in the future.

Let us first have a look at the English data. A crucial observation for the indefiniteness hypothesis is that a sentence with a definite argument in English would always entail a corresponding sentence with an indefinite argument: whenever (24a) is true, (24b) is also true, but not the other way around.

- (24) a. The director joined our discussion.
 b. A director joined our discussion.

According to Heim (2011), the articles *the* and *a* could be construed as alternatives on a Horn scale (see also Hawkins 1978), which generates a conversational implicature: *the* > *a*. Thus, if the speaker uses (24b), the hearer concludes that this is the strongest statement to which the speaker can commit under given circumstances (following Grice's maxim of quantity). The hearer, in her turn, infers that the stronger statement is false, or its presuppositions are not satisfied. Heim (2011) postulates that the choice of the logically weaker indefinite will trigger an inference that the conditions for the definiteness (existence and uniqueness) are not met.

The crucial difference between a definite and an indefinite description in English is that the definite nominal is construed with the narrowest possible domain restriction, which accounts for the uniqueness effects. However, in languages without articles, by hypothesis, a bare nominal is compatible with the whole range of domain restrictions simply because there is no element that would signal that the speaker is committed to the strongest possible statement, as in the case with the definite article in English. It follows, then, that no implicature about a 'stronger statement' is triggered and a definite reading is not ruled out for an 'indefinite' bare nominal in a language like Russian. Since there is no competing expression for the narrower domain restriction, semantically indefinite nominal phrases are compatible with a (contextually triggered) definite interpretation. Nothing prevents them from being used in situations where a definite description is used in a language with articles, e.g. in English, as they lack both uniqueness and non-uniqueness implicatures. This would mean that the domain restriction attributed to each particular bare nominal is pragmatically derived and is, in principle, a matter of (a strong) preference.

Thus, according to Heim (2011: 1006), bare nominals in languages without articles are "simply indefinites", i.e., they get a default indefinite (existential) interpretation. There is plenty of empirical evidence that Russian bare nominals can have an indefinite interpretation. For instance, they can be used in distributive contexts (27) and in existential sentences (28). Moreover, two identical (except for case) bare singular nominals can be used in the same sentence (29).

- (25) *V každom dome igral rebēnok.*
 in every house played child.NOM
 'A child played in every house.'

- (26) *V komnateležal kovër.*
in room lied carpet.NOM
‘There was a carpet in the room.’
- (27) *Durak duraka vidit izdaleka.*
fool.NOM fool.ACC sees from.afar
‘A fool sees a fool from afar.’

Following Heim (2011), we propose that for any bare nominal phrase in Russian, an indefinite interpretation is the only one derived semantically. Although a formal semantic analysis for Russian bare nominals remains to be developed, we can make a first step by assuming that there are two semantic mechanisms involved in the semantic derivation of indefinites in Russian, just like in other languages (Reinhart 1997): existential quantification and choice functions; see (28).

- (28) a. $\exists x.P(x) \wedge Q(x)$
b. $f_{CH}\{x : P(x)\}$

Quantificational indefinites are considered to be non-referential, whereas a choice function analysis could account for those cases where an indefinite refers to a (specific) individual. A full formal analysis of bare nominals in Russian will need to determine how precisely the labor is divided between the two mechanisms (or, perhaps, just one mechanism suffices, as proposed by Winter 1997), whereas we can conclude this section by stating that under the indefiniteness hypothesis presented here, the perceived definiteness of Russian bare nominals must be of a pragmatic nature. In the next section, we will describe some of the pragmatic factors responsible for definiteness effects in Russian.

4.2 Deriving definiteness in Russian

Definiteness under the hypothesis presented above is achieved by pragmatic strengthening, and is not derived by a covert iota type-shift. The definite interpretation of bare nominals will only be felicitous in contexts where there is exactly one individual that satisfies the common noun predicate. Such contexts, which facilitate pragmatic definiteness, may be of different types. The ones that are discussed below include ontological uniqueness, topicality, and anaphoricity.

We use ONTOLOGICAL UNIQUENESS to refer to those cases when uniqueness is conveyed not so much by the definite article, but by the descriptive content of a nominal phrase itself, e.g., *the earth*, *the sun*, *the moon*, etc., in English. For

instance, when we want to use an expression with the noun *sun*, a usual case is that we want to refer to the sun of our solar system, which is a unique object. We could also use *sun* with an indefinite article, but then we would overrule the assumption that we are talking about the sun of our solar system. This is the case of ontological uniqueness, i.e., the case when a definite article does not necessarily impose but rather reflects the uniqueness of the object in the actual world.

In Russian, those unique objects are usually referred to by bare singular nominals, as illustrated in (30):

- (29) *Solnce svetit.*
 sun.NOM shines
 ‘The sun is shining.’

The interpretation of *solnce* (sun.NOM) in (30) seems to certainly be definite, although it can be argued that definiteness effects in this case are simply due to the fact that the reference is made to a unique object in the real world (i.e., there are no other objects like this). Thus, in the absence of any evidence to the contrary, the subject of (30) is understood as ‘the sun of our solar system’, which is a unique object. If so, there is no uniqueness presupposition associated with the nominal *sun* in (30). Rather, it is simply the fact that there is only one such object so the noun *sun* by default denotes a singleton set. If we apply a choice function analysis to this type of case, the function will simply yield this unique object.¹⁷

The next source of definiteness is TOPICALITY, which strongly favors a definite interpretation cross-linguistically (Reinhart 1981; Erteschik-Shir 2007; i.a.). Although there is a strong preference for a definite reading of a nominal in topic position, specific indefinites are not excluded from being topics either (Reinhart 1981). Specific indefinites are discourse new, but they are anchored to other discourse referents (von Heusinger 2002), or D-linked (Pesetsky 1987; Dyakonova 2009), and thus can appear in topic position.

Topicality in Russian is associated with clause-initial position (Geist 2010; Jasinskaja 2016, i.a.). The majority of the examples discussed above involve bare nominals that are actually topics, as in (31), repeated from (25):

- (30) *Avtor éтого očerka polučil Pulitcerovskuju premiju.*
 author.NOM this essay.GEN received Pulitzer prize.ACC
 ‘The author of this essay got a Pulitzer prize.’

¹⁷Ontological uniqueness accounts for counterexamples that Dayal (2017) gives for Heim’s (2011) theory.

As was argued in §3, preverbal nominals in Russian, like the one illustrated in (31), do not give rise to uniqueness presuppositions, however, the existence of their referents is certainly presupposed. This existence presupposition is not necessarily a counterargument to the absence of semantic definiteness in bare nominals in languages without articles. In particular, those elements that appear in topic position can only be referential (see, for instance, Reinhart 1981; Erteschik-Shir 1998; Endriss 2009). An intuitive idea behind this generalization is that if there is no entity that the nominal topic refers to, this expression cannot be an aboutness topic because then there is no entity to be talked about.

Another important source of definiteness is FAMILIARITY/ANAPHORIC REFERENCE, when an antecedent is provided by the previous context or, more generally, is retrievable from shared encyclopedic knowledge of the participants of communication. This kind of definiteness is completely discourse- and situation-dependent. One example to illustrate the phenomenon is given in (32):

- (31) *Včera v zooparke ja videla sem'ju tigrov. Životnye spokojno*
yesterday in zoo I saw family.ACC tigers.GEN animals calmly
spali v uglu kletki posle obeda.
slept in corner cage.GEN after lunch
'Yesterday at the zoo I saw a family of tigers. The animals were calmly
sleeping in the corner of the cage after lunch.'

Once again, this type of examples do not pose any threat to the indefiniteness theory of bare nominals proposed in the previous section. First of all, anaphoric definites are usually not explained by appealing to the uniqueness theory of definites that we are testing here, but by a familiarity hypothesis developed in Kamp (1981) and Heim (1982). According to this hypothesis, definite descriptions introduce a referent that is anaphorically linked to another previously introduced referent. Anaphoric definites need not have any uniqueness presupposition, their referent is simply established and identified by a link to a previous antecedent.¹⁸

To sum up, in this section we have considered three factors that facilitate a definite interpretation of bare singular nominals in Russian: ontological uniqueness, topicality, and anaphoricity. We have shown that none of these cases need to rely on a presupposition of uniqueness to explain the definiteness effects that arise in any of the contexts discussed here.

¹⁸There have been attempts in the literature to unify a uniqueness approach with the familiarity approach to definites, e.g. Farkas (2002).

5 Conclusions

In this paper we have focused on the questions related to (in)definiteness in languages that do not have an overt straightforward strategy to encode/decode reference. Apparently, the contrast between the definite and indefinite interpretation is still perceptible to speakers of such languages. Taking Russian as an example of a language without articles, we have looked at various lexical, grammatical, syntactic, and prosodic means that are used in this language to express (in)definiteness, showing, however, that none of them is strong enough to be considered equivalent to a definite article in languages which have it. Based on the empirical evidence from Russian, we hypothesized that what is perceived as definiteness in languages with and without articles may be semantically different. Russian bare nominals with a perceived definite reading, unlike their English counterparts, seem to lack the presupposition of uniqueness, which should thus be linked to the semantics of the definite article. Following this line of reasoning, we claim that the perceived definiteness of Russian bare nominals in certain contexts is due to a pragmatic strengthening of an indefinite, a semantically default interpretation of a bare nominal. Thus, we conclude that there is no semantic definiteness in Russian if we assume the uniqueness theory of definiteness. Instead, we suggest that bare nominals in Russian are semantically indefinite and definiteness effects are achieved by pragmatic strengthening. The pragmatic definiteness effects emerge in the case of ‘ontologically unique’ referents, nominals in topic position or familiar/anaphoric nominals, whose interpretation is strongly dependent on the discursive or situational context.

Abbreviations

ACC	accusative	LOC	locative
DEF	definite article	NOM	nominative
GEN	genitive	PFV	perfective
IPFV	imperfective		

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Chapter 14

Inherent vs. accidental uniqueness in bare and demonstrative nominals

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This paper provides an analysis of Czech bare vs. demonstrative NPs and in particular of their referential uses involving situational uniqueness. Contrary to the traditional view that bare NPs correlate with uniqueness and demonstrative NPs with anaphoricity, I argue that the relevant classification involves two types of uniqueness: inherent uniqueness, correlated with bare NPs, and accidental uniqueness, correlated with demonstrative NPs. The notions of inherent and accidental uniqueness are formalized using situation and modal semantics. An extension to generic, anaphoric, and non-specific NPs is proposed.

Keywords: Czech, bare NPs, demonstratives, uniqueness, situation semantics

1 Introduction

In this paper I investigate the meaning and distribution of two kinds of nominal phrases (NPs) in Czech: BARE NPs and DEMONSTRATIVE NPs. A bare NP, illustrated by *garáž* ‘garage’ in (1a), is an NP without any determiners such as quantificational determiners, demonstratives, or indefinite markers. A demonstrative NP, illustrated by *ta garáž* ‘DEM garage’, is an NP introduced by a demonstrative.^{1,2}

¹A comprehensive discussion of the Czech demonstrative system can be found in Berger (1993). For recent discussion couched in the formal approach, see Šimík (2016) (I use “formal” as shorthand for generative/formal-semantic). Notice also that I gloss the Czech demonstrative *ten/-ta/to* ‘DEM.M/F/N’ as DEM, as it does not perfectly correspond to either ‘this’ or ‘that’ (it is primarily anaphoric and also largely neutral with respect to proximity).

²I distinguish between “contexts”, which involve explicitly uttered material that precedes the target utterance (I only provide English translations), and “situations”, which only describe the



- (1) a. *Context*: ‘I approached a friend’s house.’
Garáž zářila novotou. BARE NP
garage shined novelty.INSTR
‘The garage shined with novelty.’
- b. *Context*: ‘A friend showed me his new garage.’
Ta garáž zářila novotou. DEMONSTRATIVE NP
DEM garage shined novelty.INSTR
‘The garage shined with novelty.’

Both bare and demonstrative NPs can be referential and can thus correspond to English definite NPs, as they do in (1). As indicated by the contexts in (1), bare NPs are suitable for reference to situationally unique objects, ranging from large situations, such as the whole world (and, correspondingly, NPs like *papež* ‘the (unique) Pope (in the world)’), to small situations, such as a family house (and NPs like *garáž* ‘the (unique) garage (belonging to the family house)’), while demonstrative NPs are suitable for deictic reference (left aside in this paper) or anaphoric reference. For a useful overview of definiteness-related form–function mapping in Czech, based on the typology of Hawkins (1978), see Běličová & Uhlířová (1996: chapter 3). The idea that bare NPs refer to situationally unique referents and demonstrative NPs are anaphoric has recently been recognized and incorporated also in formal linguistics, a development that is largely due to the influential dissertation by Schwarz (2009). It has been assumed for languages as diverse as Mauritian Creole (Wespel 2008), Akan (Arkoh & Matthewson 2013), or Mandarin Chinese (Jenks 2018). The bare vs. demonstrative divide in these languages is considered by Schwarz (2013) to correspond to the weak vs. strong definite article divide in German; see (2).³

- (2) a. *Context*: ‘I approached a friend’s house.’
Ich ging zur Garage. WEAK DEFINITE ARTICLE
I went to.the garage
‘I went to the garage.’
- b. *Context*: ‘A friend showed me his new garage.’
Ich ging zu der Garage. STRONG DEFINITE ARTICLE
I went to the garage
‘I went to the garage.’

setting in which the target utterance is made.

³The case of Akan has been reconsidered in Bombi (2018).

In this paper, I zoom in onto the situational uniqueness function and show that not all situationally unique referents are referred to by bare NPs in Czech. In some cases, a demonstrative NP is needed. I will argue that bare NPs refer to objects that are inherently unique (relative to some situation), while demonstrative NPs refer to objects that are accidentally unique (relative to some situation). I will also argue that the notion of inherent uniqueness is akin to genericity and can in fact subsume generic reference. Finally, I will suggest that anaphoric reference is inherently accidental. The contrast between inherent and accidental uniqueness therefore has the potential to replace the more commonly assumed unique vs. anaphoric contrast. A full exposition of this general claim must be left for future research, however.

The paper is organized as follows. In §2, I present the relevant contrast between bare and demonstrative NPs in Czech and suggest – informally at first – that it could be understood in terms of inherent and accidental uniqueness. These two concepts are formalized in §3, which also provides some background on situation semantics and an explicit syntax and semantics of bare and demonstrative NPs in Czech. In §4, I focus on presenting additional evidence in favor of the correlation between the NP types and the uniqueness types. An outline of how the analysis could be extended to generic, anaphoric, and non-specific NPs is presented in §5. In §6, I summarize the results and give a brief research outlook.

2 Initial observation

Let us start with two simple situations and NPs used in them. Example (3) involves a classroom situation s_1 with a single blackboard in it, as is usual. As one would expect, the blackboard, being unique in that particular situation, is referred to by a bare NP. Example (4) involves a simple conversation situation s_2 , which happens to have a single book in it. Despite the uniqueness of the book, a demonstrative NP is appropriate.

- (3) *Situation s_1* : Teacher (T) with pupils in a classroom. T addresses one of the students:

T *Smaž* {*tabuli* / #*tu tabuli*}, *prosím*.
 erase.IMP blackboard DEM blackboard please
 ‘Erase the blackboard, please.’

- (4) *Situation s₂*: A and B are having a conversation, A is holding a book (the only book in the situation), B says (without any salient pointing gesture and without having talked about the book ever before):

B {*Dej* / *Ukaž*} *mi* {*tu knihu* / #*knihu*}.

give.IMP show.IMP me DEM book book

‘Give/Show me the book.’ (adapted from Krámský 1972: 62)

What brings about the asymmetry between (3) and (4)? I will argue that a bare NP is appropriate in the former case because classrooms usually have a single blackboard in them; the blackboard is *inherently* unique in classrooms. On the other hand, it is not usually the case that when A and B talk to each other, there is a single book in that situation; the book in *s₂* is only *accidentally* unique. I will turn to a formalization of inherent vs. accidental uniqueness shortly. For the moment, let me discuss a number of issues that might blur the contrast under discussion.

An objection that instantly comes to mind when considering (4) is that the reference to the book by *tu knihu* ‘DEM book’ involves deixis. This view is supported by the fact that a slight pointing gesture or even just a peek towards the referent naturally, albeit not necessarily, accompanies the utterance (4B). But an account in terms of deixis also has problems. Deictic demonstratives normally carry prosodic prominence and single out an object out of a set of objects all of which satisfy the same nominal description, as in *I want THIS book, not THAT book*. In (4), there is no such motivation for the use of a demonstrative, as the referent is the only book in the situation. Also, prosodic prominence is on *knihu* ‘book’, not the demonstrative. Finally, it is good to point out that (4B) can be uttered even if the conversation takes place via a videoconference and where B saw, at some previous point of the conversation, that A has a book, but, at the time of uttering (4B), B no longer has visual access to it (and hence cannot point to it). All of these concerns render a treatment in terms of deixis problematic.⁴ Moreover, in §4, I will provide examples where deixis fares even worse, as the referent is not even present in the utterance situation.

The reader will have noticed that I marked the inappropriate NP uses by # rather than by *. The implication is that the versions with the inappropriate NPs

⁴An anonymous reviewer is not convinced by these arguments (although s/he does not express her/himself to those presented later). S/he claims, for instance, that demonstration could be achieved without visual access to the referent, suggesting an analogy from sign language where demonstration can be achieved by pointing to an abstract index in a signing space. See Ahn (2019: Ch. 5) for a recent discussion.

successfully convey a meaning – in fact, the meaning indicated by the translation – but are not felicitous in the situation. We can learn a bit about the source of their infelicity by inspecting the additional implications they carry. Let us turn to (3) first. The use of a demonstrative NP – *tu tabuli* ‘DEM blackboard’ – implies that the teacher is in an affective state. It would be appropriate in a situation where the teacher asked the student to erase the blackboard repeatedly and got annoyed by the student’s inactivity. In other words, the demonstrative in (3) is an instance of the so-called AFFECTIVE DEMONSTRATIVE.⁵

Let us now consider (4). Again, certain adjustments to the situation would be needed in order for the bare NP to be licensed. Two types of scenarios come to mind. First, the demonstrative could be omitted in case there was a selection of other objects, e.g. a magazine, a newspaper, and a DVD, all of which might be of interest to the discourse participant B. By using a bare NP *knihu* ‘book’, B would indicate that she would like to have/see the book, not, say, the magazine. This exceptional contrast-based licensing of bare NPs (or definite NPs with a weak definite article in a language like German) in situations where a demonstrative (or strong definite article) would be expected (including anaphoric uses of NPs) has occasionally been noticed in the literature.⁶ The phenomenon is still relatively poorly understood. Another type of situation that would afford the use of a bare NP in (4B), although somewhat implausible, is that A and B are regularly in conversation situations with a single book in them and where that book is an integral (inherent) part of that kind of situation. The fact that such an implausible situation can be accommodated supports the semantic reality of the concept of inherent uniqueness.

The reader should bear in mind that the examples in this paper often lend themselves to accommodation processes of the kind discussed above and that accommodating a certain inference may license the use of an NP that is marked as inappropriate.

⁵Affective demonstratives (term due to Liberman 2008) are cross-linguistically common. For some discussion, see Mathesius (1926), Šimík (2016) (Czech); Rudin (to appear) (Bulgarian and Macedonian); Lakoff (1974), Liberman (2008) (English); Potts & Schwarz (2010) (English, German); Davis & Potts (2010) (English, Japanese).

⁶A relevant German example is discussed by Schwarz (2009: p. 32, ex. (54)), although Schwarz does not link the observed effect to contrastiveness.

3 Proposal

3.1 Background on situation semantics

My proposal is couched in situation semantics, an extension of possible world semantics, whereby situations are parts of possible worlds (the maximal situations) and are organized in a semi-lattice, just like entities in the Link (1983)-style representation of plural and mass nouns. The foundations of modern situation semantics were laid by Kratzer (1989) and important further developments include von Fintel (1994) (application to adverbial quantification) or Elbourne (2005) (application to definite descriptions). Accessible overviews and introductions to situation semantics include Schwarz (2009: chapter 3), Elbourne (2013: chapter 2), and Kratzer (2019). The present treatment of situations will be largely informal, however, and will not rely on the many complex properties of fully fledged situation semantics.

In situation semantics, constituents are interpreted relative to situations. Consider example (5a), tailored after Percus (2000), where *all Slavic linguists* quantifies over actual Slavic linguists and ponders the hypothetical situations in which they are not linguists but literary scholars. These situations would then be such that there would be no Slavic linguistics in them. The truth-conditions are captured informally in (5b). The formula makes clear that, crucially, the NP *Slavic linguists* is interpreted relative to the actual s_0 and the predicative NP *literary scholars* relative to the hypothetical s_h . I will follow Schwarz (2009) and call the situations relative to which NPs (or other constituents) are interpreted RESOURCE SITUATIONS.

- (5) a. If all Slavic linguists were literary scholars, there would be no Slavic linguistics.
 b. $\forall s_h [\forall x [\text{SLAVIC LINGUISTS}(x)(s_0) \rightarrow \text{LITERARY SCHOLARS}(x)(s_h)] \rightarrow \neg \exists y [\text{SLAVIC LINGUISTICS}(y)(s_h)]]$

Not just quantificational, but also referential NPs, including bare and demonstrative NPs, are interpreted relative to resource situations. This is illustrated in example (6), in which the value of the resource situation affects the truth conditions of the whole sentence. If (*toho*) *kouzelníka* ‘(DEM) magician’ is interpreted relative to the situations compatible with Jitka’s beliefs (*de dicto* interpretation), (6F) is true if Jitka wants to see the “magician” she spotted before the show (perhaps because he had a cool outfit). If, on the other hand, the NP is interpreted relative to the actual situation (*de re* interpretation), (6F) is true if she wants to

see the actual performer (perhaps because she was looking forward to seeing the magician even before going to the show).⁷

- (6) *Situation*: Jitka and her parents visit a show where a magician and a clown are announced. Just before the show, Jitka spots two men in the crowd who are dressed a bit like a magician and like a clown (respectively). She wrongly believes them to be the performers. Her parents are aware of this and talk to each other about who she wants to see. The father says:

F *Jitka chce vidět (toho) kouzelníka.*
 Jitka wants see DEM magician
 ‘Jitka wants to see the magician.’

The choice of the interpretation and of the NP type affects the inferences in delicate ways. Leaving deictic, affective, and anaphoric readings aside, here are the possible inferences that arise in the four logical combinations: *de re* + demonstrative implies that it is not typically the case that there is a single magician in this (type of) show; *de dicto* + demonstrative implies that it is not typically the case that there is a single magician in Jitka’s beliefs about the pre-show situation; *de re* + bare implies that there is typically a single magician in this (type of) show; *de dicto* + bare highlights the contrast between the magician and the clown in Jitka’s beliefs.

The last important notion to be introduced is the notion of a TOPIC SITUATION. Topic situations, sometimes called Austinian topic situations (Austin 1950), are situations that propositions are “about”. A simple proposition like *It’s raining* will be true or false depending on which situation we are talking about (where we are, at what time, etc.). For formal-semantic treatment of topic situations, see Schwarz (2009) and Kratzer (2019). The present treatment of topic situations will be largely informal. What is important to keep in mind is that resource situations (situations relative to which NPs are interpreted) are very often and, for the purposes of this paper, will always be identical to the corresponding topic situations.⁸

3.2 Formalizing inherent vs. accidental uniqueness

I define the type of uniqueness by using universal quantification over situations that are “like” (\approx) some relevant evaluation situation, typically the topic situation.

⁷For a recent version of a situation-based theory of the *de dicto* vs. *de re* contrast, see Keshet (2008; 2010).

⁸The identity of the topic and resource situation can be achieved either by coreference (coindexing) or by binding, using a specialized operator; see e.g. Büring (2004).

I will come to a more precise characterization of the “likeness” relation shortly. For the moment, let us consider how the definitions in (7) and (8) capture our two simple examples from §2 – the blackboard example and the book example. The blackboard is *inherently* unique in the classroom situation provided in (3) because it holds that all situations that are “like” that classroom situation, which includes situations at different times, with different people in it, etc., but with important parameters such as the “identity” of the classroom kept constant, are such that there is exactly one blackboard in those situations. Therefore, the blackboard is inherently unique in (3). On the other hand, the book is only *accidentally* unique in the conversation situation provided in (4): even though there is exactly one book in the situation, it does *not* hold that all situations that are “like” that conversation situation, which includes various situations of A and B having a conversation, at different times and places, are such that there is exactly one book in those situations.⁹

(7) *Inherent uniqueness*

For any property P , entity x , and situation s_0 , such that $P(s_0)(x) = 1$,

x is INHERENTLY UNIQUELY IDENTIFIABLE in s_0 iff

$\forall s[s \approx s_0 \rightarrow \exists! y[P(s)(y)]]$

All situations that are like s_0 are such that there is exactly one entity with property P in those situations.

(8) *Accidental uniqueness*

For any property P , entity x , and situation s_0 , such that $P(s_0)(x) = 1$,

x is ACCIDENTALLY UNIQUELY IDENTIFIABLE in s_0 iff

$\exists! z[P(s_0)(z)] \wedge \neg \forall s[s \approx s_0 \rightarrow \exists! y[P(s)(y)]]$

Exactly one entity is P in s_0 and it is not the case that all situations that are like s_0 are such that there is exactly one entity with property P in those situations.

The “likeness” relation (\approx) is essentially a modal accessibility relation, which could be formulated by a version of Kratzer’s (1981; 1991; 2012) modal semantics. Kratzer’s semantics of modal expressions like *must*, provided for explicitness in (9) (using Hacquard’s 2011: 1493 formulation, slightly adapted), relies on

⁹The notion of inherent vs. accidental uniqueness might seem reminiscent of Löbner’s (1985; 2011) concept types, whereby inherent uniqueness might correspond to the “individual” and “functional” types, and accidental uniqueness to the “sortal” and “relational” types. Yet, Löbner’s concept types are types of nouns and are, therefore, lexically determined (e.g., the noun *sun* is always individual and the noun *book* is always sortal). The distinction between inherent and accidental uniqueness is sensitive to the evaluation situation. Moreover, one and the same noun can involve both types of uniqueness.

two kinds of CONVERSATIONAL BACKGROUNDS – a MODAL BASE f and an ORDERING SOURCE g . These conversational backgrounds are free variables whose values are determined contextually. In a sentence like *John must be at home*, with *must* interpreted epistemically, the value of the modal base f at some evaluation situation s_0 is the set of propositions compatible with what we know in s_0 – so-called epistemic modal base (the propositions might include ‘it is 5pm’, ‘the lights in John’s house are on’, and ‘John finishes work at 3pm’). This set of propositions is turned into a set of possible worlds (single proposition) by \bigcap . Then, $\text{BEST}_{g(s)}$ imposes an ordering on that set of possible worlds, picking out only those worlds that best correspond to what is normal or usual (excluding possibilities in which John forgot to turn the lights off in the morning and had an accident on the way home, for instance) – so-called stereotypical ordering source.

- (9) For any evaluation situation s_0 and conversational backgrounds f, g ,

$$\llbracket \text{must} \rrbracket = \lambda q_{(s,t)} \forall w [w \in \text{BEST}_{g(s_0)}(\bigcap f(s_0)) \rightarrow q(w) = 1]$$

The reason why we need a *version* of Kratzer’s semantics is that the situations we quantify over in (7)/(8) are not situations where all the facts or, for our case, circumstances of the evaluation situation s_0 hold. We need to generalize/abstract over selected parameters and quantify, for instance, over situations that have a different temporal parameter than s_0 (e.g., not just the classroom now, but also the classroom today, etc.). We could postulate a subspecies of Kratzer’s modal base, call it GENERIC MODAL BASE f_{GEN} , which takes the evaluation situation s_0 and returns a set of propositions with various parameters of s_0 modified (e.g. $\{\lambda s[s \text{ is the classroom situation at } t] \mid t \text{ is some time}\}$). At the same time, however, there must be a limit to the variation in the modal base, otherwise inherent uniqueness could never be satisfied (there certainly is some time at which there was no blackboard in the classroom, such as the time when the classroom was freshly built, but not yet furnished). Restricting the modal base is, of course, the function of Kratzer’s ordering source. The particular type of ordering source needed is the stereotypical ordering source, which will help us limit the situations to be quantified over to the normal or usual ones (thereby excluding situations such as the “unfinished classroom” situation).

Armed with this theory, we could reformulate the universal quantification in (7) by (10).

- (10) $\forall s[s \in \text{BEST}_{g(s_0)}(\bigcap f_{\text{GEN}}(s_0)) \rightarrow \exists! y[P(s)(y)]]$

While using bare or demonstrative NPs, discourse participants start from the evaluation situation and come up with some relevant restricted generalization

over that situation, checking whether uniqueness remains satisfied across the relevant situations (\rightsquigarrow inherent uniqueness) or not (\rightsquigarrow accidental uniqueness). In what follows, I will stick to the simple formalization provided in (7)/(8), assuming that something like (10) could be its more precise version.

Let me conclude this subsection by providing the formal truth-conditions of our initial examples (I ignore the contribution of imperative mood for simplicity). In these truth-conditions, inherent vs. accidental uniqueness is encoded as a presupposition (enclosed in a box for clarity), which is relativized to the topic situation s_T .¹⁰

$$(11) \quad \llbracket \text{erase blackboard} \rrbracket^c = \lambda s . \text{ERASE}(s)(\iota x \text{ BLACKBOARD}(s)(x))(\text{HR}(c))$$

and presupposes $\boxed{\forall s' [s' \approx s_T \rightarrow \exists! x [\text{BLACKBOARD}(s')(x)]]}$

$$(12) \quad \llbracket \text{show me DEM book} \rrbracket^c = \lambda s . \text{SHOW}(s)(\iota x \text{ BOOK}(s)(x))(\text{SP}(c))(\text{HR}(c))$$

and presupposes $\boxed{\exists! z [P(s_T)(z)] \wedge \neg \forall s' [s' \approx s_T \rightarrow \exists! x [\text{BOOK}(s')(x)]]}$

3.3 The syntax-semantics of bare vs. demonstrative NPs

There are many ways of incorporating inherent vs. accidental uniqueness into the representation of NPs or the clauses they are contained in. In what follows, I will sketch one possible analysis, where inherent uniqueness is taken to be a property of topic situations (rather than NPs) and accidental uniqueness a property of demonstratives. The advantage of this view is that it gives us enough flexibility in the treatment of bare NPs, which are known to be underspecified with respect to their referential properties – depending on the context and various grammatical properties, they can correspond to definite as well as indefinite NPs.¹¹

3.3.1 Bare NPs and inherent uniqueness

I follow the spirit of Heim's (2011: 1006) suggestion, supported by the experimental results of Šimík & Demian (2020), and assume that bare NPs contribute

¹⁰For the sake of clarity, I rely on some standard semantic instruments in formulating (11) and (12), in particular the IOTA type shift (Partee 1987) and the notation of the presupposition. This detail will be reconsidered. SP and HR stand for speaker and hearer, respectively.

¹¹The literature on (Slavic) bare NPs is vast. The traditional underspecification view is represented for instance by Chierchia (1998) or Geist (2010). But see also Dayal (2004; 2011), who treats almost all bare NPs in articleless Slavic languages essentially as definites.

no definiteness-related presupposition (such as uniqueness or maximality). Contrary to Heim (2011), however, I treat argumental bare NPs not as existential quantifiers, but as referential expressions.¹² As demonstrated in Figure 1, I take the basic predicative (property-type) NP to be shifted by a Skolemized choice function f_1 , whose index is mapped to a situation. The choice function itself is existentially bound in the immediate scope of the situation it is relativized to. I take this to be a default process – in the lack of any explicit indicators of how the choice function should be interpreted (i.e., determiners or indefinite markers), its scope is tied to the scope of its situation binder. This approach makes some non-trivial predictions, which, however, cannot be explored here for space reasons (though see §5.3 for some basic discussion).¹³ The corresponding compositional meaning is spelled out in (13). The choice function picks out some entity that is a blackboard in situation $g(1)$. If this situation is the topic situation (s_T), then the whole bare NP will refer to some blackboard in the topic situation. If the topic situation is our classroom situation, then the NP will refer to the unique blackboard in that situation.

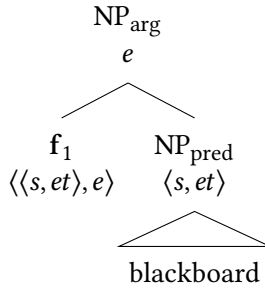


Figure 1: Representation of an argumental bare NP

- (13) a. $\llbracket \text{NP}_{\text{pred}} \rrbracket^g = \lambda s \lambda x [\text{BLACKBOARD}(s)(x)]$
 b. $\llbracket f_1 \rrbracket^g = \lambda P [\text{some } x \text{ such that } P(g(1))(x)]$
 c. $\llbracket \text{NP}_{\text{arg}} \rrbracket^g = \text{some } x \text{ such that } \text{BLACKBOARD}(g(1))(x)$

¹²I assign “referentiality” a weak (but commonly assumed) sense, namely “being of type e ”. Being referential thus implies nothing about being presuppositional or familiar.

¹³For a choice-functional approach to Slavic indefinites, including the use of Skolemization, see Yanovich (2005) or Geist (2008). My proposal is in principle compatible with theirs, the only difference lies in the nature of the Skolem argument. I take the situation-type Skolem argument to be a kind of default that can be overridden by using various determiners, esp. so-called indefinite markers.

- d. $\llbracket \text{NP}_{\text{arg}} \rrbracket^g = \text{some } x \text{ such that } \text{BLACKBOARD}(s_{\tau})(x) \quad (\text{for } g(1) = s_{\tau})$

Notice that the bare NP is entirely presupposition-free – neither does it introduce a uniqueness presupposition (cf. Dayal 2004), nor the presupposition of the blackboard’s inherent uniqueness. The question is how the implication of inherent uniqueness enters the semantics. I will assume, without much argumentation for the present purposes, that the implication is part of our knowledge about topic situations. It is, therefore, a PRAGMATIC PRESUPPOSITION in the sense of Stalnaker (1974).¹⁴ Speaking more generally, situations with inherently unique parts are good candidates for the use of a bare NP because they make it particularly easy for the discourse participants to agree on the referent for such an NP; the referent is simply the unique entity that satisfies its description and that is normally present and uniquely identifiable in the situation.

3.3.2 Demonstrative NPs and accidental uniqueness

My analysis of demonstrative NPs is parallel to what I proposed for bare NPs; see Figure 2. I take the demonstrative to be an indexed definite determiner. As shown in (14b), it introduces a presupposition – a SEMANTIC PRESUPPOSITION this time, namely the presupposition of accidental uniqueness. If the presupposition is satisfied, the NP picks out the accidentally unique individual in the resource situation. If the resource situation is the topic situation, which in turn corresponds to our conversation situation, then the demonstrative NP refers to the unique book in that situation.

- (14) a. $\llbracket \text{NP}_{\text{pred}} \rrbracket^g = \lambda s \lambda x [\text{BOOK}(s)(x)]$
 b. $\llbracket \text{DEM}_1 \rrbracket^g = \lambda P : \exists! z [P(g(1))(z)] \wedge \neg \forall s [s \approx g(1) \rightarrow \exists! y [P(s)(y)]]$.
 the x such that $P(g(1))(x)$
 c. $\llbracket \text{NP}_{\text{arg}} \rrbracket^g$ defined if $\exists! z [P(g(1))(z)] \wedge \neg \forall s [s \approx g(1) \rightarrow \exists! y [\text{BOOK}(s)(y)]]$
 if defined, then
 $\llbracket \text{NP}_{\text{arg}} \rrbracket^g = \text{the } x \text{ such that } \text{BOOK}(g(1))(x)$
 d. $\llbracket \text{NP}_{\text{arg}} \rrbracket^g$ defined if $\exists! z [P(s_{\tau})(z)] \wedge \neg \forall s [s \approx s_{\tau} \rightarrow \exists! y [\text{BOOK}(s)(y)]]$
 if defined, then
 $\llbracket \text{NP}_{\text{arg}} \rrbracket^g = \text{the } x \text{ such that } \text{BOOK}(s_{\tau})(x) \quad (\text{for } g(1) = s_{\tau})$

¹⁴For an accessible discussion of the phenomenon of presupposition and the distinction between semantic and pragmatic presupposition, see Beaver & Geurts (2014).

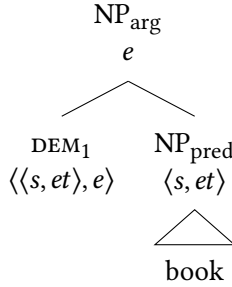


Figure 2: Representation of an argumental demonstrative NP

Before we move on, let me clarify one important thing. The present analysis of demonstrative NPs primarily applies to cases of situational uniqueness. Whether the analysis could or should be extended to deictic, anaphoric, or affective demonstratives is yet to be seen (see §5 for a preliminary extension to anaphoric demonstratives). For the moment, I assume that the present analysis is compatible with a syntactically and semantically richer analysis of demonstrative determiners, under which the demonstrative does not only contribute definiteness-related semantics (uniqueness, or accidental uniqueness), but also another entity-type index, whose value – determined anaphorically or extra-linguistically – is equated (or related in some other way) to the referent of the definite core. I refer the reader to Šimík (2016) for relevant discussion.¹⁵

4 Evidence

Let us now go through a number of examples illustrating the effect of NP type on uniqueness type, while at the same time doing away with the caveats associated with our initial examples. In order to minimize confounding factors, I will consider one example where the topic/resource situation is held constant and where the referent differs, §4.1, and another one where the referent description is held constant, but the topic/resource situation differs (minimally), §4.2. I conclude with an example where the NP type (bare vs. demonstrative) steers the discourse participants' attention to two different topic/resource situations, §4.3.

¹⁵To be somewhat more precise, I believe that the present DEM could replace Šimík's (2016: section 3.2.2) D without any collateral damage.

4.1 Same situation, different referent

Consider example (15), involving an office desk situation and two student assistants, both familiar with the situation. The example shows that reference to the single computer in the office is made by a bare NP, while reference to the single book in the office is made by a demonstrative NP. This is because the computer is inherently unique in that situation, while the book is only accidentally unique there, as highlighted by the formulas.

- (15) *Situation*: Two student assistants A and B are at their shared workdesk, which they share with other student assistants and where there's a computer and a couple of other things, including a book (it doesn't really matter to whom the book belongs). A is looking for a pencil, B says:

B₁ *Nějaká tužka je vedle {počítače / #toho počítače}.* INHERENT
 some pencil is next.to computer DEM computer
 'There's a pencil next to the computer.'

$$\boxed{\forall s[s \approx s_T \rightarrow \exists! x[\text{COMPUTER}(s)(x)]]}$$

All situations like the topic situation – A and B's shared office (desk) – have exactly one computer in it.

B₂ *Nějaká tužka je vedle {té knížky / #knížky}.* ACCIDENTAL
 some pencil is next.to DEM book book
 'There's a pencil next to the book.'

$$\boxed{\exists! z[\text{BOOK}(s_T)(z)] \wedge \neg \forall s[s \approx s_T \rightarrow \exists! x[\text{BOOK}(s)(x)]]}$$

There is exactly one book in the topic situation – A and B's shared office (desk) – and it does not hold that all situation like the topic situation have exactly one book in it.

4.2 Same referent, different situation

Consider examples (16) and (17). The situations are minimally different – one involves a bedroom and the other a hotel room. The rooms could in fact look completely identical, clearly suggesting that what is at stake is the knowledge of the discourse participants – the married couple – about the situation. The case of (16) is simple and behaves as expected – the lamp is uniquely inherent in the bedroom situation and is therefore referred to by a bare NP.¹⁶ Example (17) calls

¹⁶If the demonstrative is used, the affective reading becomes particularly salient, esp. if supported by an adverb like *zase* 'again', which could happen in a scenario where there have been problems with the lamp repeatedly and the husband is annoyed by the lamp not working.

for more attention, as it reveals something important about the generic modal base involved in the semantics of NPs. Given that the married couple has just arrived, they have not had any experience of the room that could provide the basis for generalizations. There are two possibilities of what the relevant conversational background could be in this case. One is that the contribution of the modal base is weakened and the quantification is restricted mainly or only by the stereotypical ordering source. This would indeed give rise to a domain of bedroom situations all of which have exactly one lamp in it; after all, it is highly improbable that the number of lamps would differ from one situation to another. If this was the domain of quantification, we would expect a bare NP to surface, contrary to facts. Obviously, the discourse participants choose a different conversational background – one that is based on their experience. Because they have no prior experience with this particular room, they generalize over all hotel room situations (the contribution of the generic modal base). Even if the stereotypical ordering source filters out the abnormal ones, we end up with a set of situations in which the number of lamps is not constant – it is not the case that all normal hotel room situations involve exactly one lamp. It is this conversational background that motivates the use of the demonstrative NP.

- (16) *Situation:* Husband H and wife W are in their bedroom, where they happen to have a single lamp. H says:

H {*Lampička* / #*Ta lampička*} *nesvítí.* INHERENT
 lamp DEM lamp NEG.light

‘The lamp doesn’t work.’

$$\boxed{\forall s[s \approx s_T \rightarrow \exists! x[\text{LAMP}(s)(x)]]}$$

All situations that are like the topic situation – the bedroom of the married couple – have exactly one lamp in it.

- (17) *Situation:* Husband H and wife W have just arrived in their hotel. In the room, there happens to be a single lamp, and both H and W are familiar with this fact.

H {*Ta lampička* / #*Lampička*} *nesvítí.* ACCIDENTAL
 DEM lamp lamp NEG.light

‘The lamp doesn’t work.’

$$\boxed{\exists! z[\text{LAMP}(s_T)(z)] \wedge \neg \forall s[s \approx s_T \rightarrow \exists! x[\text{LAMP}(s)(x)]]}$$

There is exactly one lamp in the topic situation – the hotel room of the married couple – and it does not hold that all situations like the topic situation (i.e., all hotel rooms) have exactly one lamp.

4.3 Choice of NP type affects choice of situation

Example (18) demonstrates a number of things important to the proposal. First, it involves reference to entities that are not present in the immediate discourse situation. As such, it does away with the deixis confound (see the discussion below (4)). I should also point out that the intended interpretation is not anaphoric – the relevant referent need not have been mentioned before the utterance under investigation. Second, the example shows that the implications associated with bare vs. demonstrative NPs are salient enough to affect the choice of the relevant topic/resource situation and, consequently, the choice of the referent, which in turn affects the truth conditions (see also example (6) and the associated discussion).

- (18) *Situation*: A and B, both from town T1, are having a conversation about an environmental committee meeting that they both attended last week in a neighboring town T2. The ad hoc committee consisted of various public figures, including two mayors, one of whom was the mayor of T1 (the town where both A and B live). A says:

- A₁ *Starosta podal přesvědčivé argumenty.* INHERENT
 mayor gave convincing arguments
 i. ✓ ‘The mayor of T1 (our mayor) gave convincing arguments.’
 ii. ✗ ‘The mayor of T2 gave convincing arguments.’

$$\boxed{\forall s[s \approx s_1 \rightarrow \exists! x[\text{MAYOR}(s)(x)]]}$$

(where s_1 is a situation based on usual shared experience of A and B; in that situation, there is normally a single mayor, namely the mayor of T1)

- A₂ *Ten starosta podal přesvědčivé argumenty.* ACCIDENTAL
 DEM mayor gave convincing arguments
 i. ✓ ‘The other mayor (not of T1) gave convincing arguments.’
 ii. ✗ ‘The mayor of T1 (our mayor) gave convincing arguments.’

$$\boxed{\exists! z[\text{MAYOR}(s'_1)(z)] \wedge \neg \forall s[s \approx s'_1 \rightarrow \exists! x[\text{MAYOR}(s)(x)]]}$$

(where s'_1 is a/the committee meeting situation to the exclusion of the mayor of T1)

Consider first the utterance (18A₁), which only has the reading in (i), but not the one in (ii). The baseline topic situation (a/the committee meeting situation) is not one that could afford a referent for the bare NP, as it is not the case all committee

meetings have a single mayor in them. Hence, by using a bare NP, A invites B to accommodate a resource situation that is different from the topic situation, a situation that both A and B are familiar with (a situation whose facts are based on A's and B's common shared experience) and which does have – stereotypically – exactly one mayor in it. This mayor is the mayor of T1, the town where A and B come from. The truth conditions of (18A₂) are inverse, as the demonstrative NP refers not to the mayor of T1, but to the other mayor present at the meeting. This brings us to the last important point illustrated by this example. The uniqueness presupposition contributed by the demonstrative is apparently not satisfied in this case (which is why I have highlighted this presupposition by wavy underlining): it does not hold that there was a single mayor in the committee meeting. Yet, the non-uniqueness could just be an illusion. The reason is that if we modify the situation a bit, so that there are three mayors in the meeting (mayor of T1 plus two others), (18A₂) leads to a presupposition failure and would likely be followed by a 'wait a minute' reaction from B (von Stechow 2008). Therefore, I hypothesize that the mayor of T1 is not really considered as a candidate for being referred to by the demonstrative NP, probably because he would have to be referred to by a bare NP, as in (18A₁). The precise mechanism of this competition-based domain restriction is left for future research.¹⁷

To sum up, in this section I have provided evidence that further supports the reality of the inherent vs. accidental uniqueness distinction and its association with bare vs. demonstrative NPs. I attempted to do away with some potential confounds by using minimal pairs – particularly identical NP descriptions (minimally varying the situation) and identical situations (minimally varying the NP description).

5 Extensions

So far, I have only focused on NPs that refer to referents that are uniquely identifiable relative to the topic situation. By doing that, I have demonstrated that Czech demonstrative NPs are not just reserved for deictic or anaphoric reference, but can also be used for situational reference as long as the presupposition of accidental uniqueness is satisfied. While I will not be able to discuss deictic

¹⁷Inspiration might be sought in so-called anti-uniqueness inferences triggered by the use of an indefinite NP where a definite NP is expected. A *Czech president* implies that there are multiple Czech presidents and, even if the NP refers to somebody (or if there is a suitable witness, if the NP is quantificational), then it is not the individual that one would refer to by *the Czech president*. For relevant discussion, see Hawkins (1978); Heim (1991); Sauerland (2008).

or affective demonstrative NPs (for that, see Šimík 2016 and the references cited therein), I would like to outline briefly how the analysis could be applied to a few other cases, namely generic NPs, anaphoric NPs, and non-specific NPs.

5.1 Generic NPs

Inherent uniqueness is clearly related to genericity. While NPs referring to inherently unique entities refer to PARTICULARS, entities with tangible properties located in a particular space and time, generic NPs refer to more abstract objects called KINDS. Reference to kinds is often achieved by bare NPs, sometimes even in languages with articles (cf. English bare plurals; Carlson 1977). This also holds for Czech, as illustrated in (19).¹⁸

- (19) a. *Vlk je savec.*
 wolf.SG is mammal.SG
 ‘The wolf is a mammal.’
 b. *Ptáci se vyvinuli z dinosaurů.*
 birds REFL evolved from dinosaurs.
 ‘Birds evolved from dinosaurs.’
 c. *Nesnáším {kapra / houby}.*
 hate.1SG carp.SG mushrooms
 ‘I hate {carp / mushrooms}.’

I would like to argue that generic NPs are a special case of inherently unique NPs in my analysis.¹⁹ Statements involving generic NPs, like the ones in (19), are often evaluated with respect to relatively large topic situations or possibly the whole world (maximal situation). Consider (19a) for illustration. This statement intuitively satisfies the presupposition in (20) – all worlds that are like the actual world in relevant respects are such that they have exactly one wolf-kind in them. In other words, the inherent uniqueness of the relevant kind is satisfied in (19a) and so it is in other cases in (19) and more generally, I would argue.

$$(20) \quad \forall w[w \approx w_0 \rightarrow \exists! x[\text{WOLF}_K(w)(x)]]$$

¹⁸Some languages with articles use definite NPs to refer to kinds, either obligatorily so (e.g. Spanish; Borik & Espinal 2015), or in variation with bare NPs (e.g. Brazilian Portuguese; Schmitt & Munn 1999). For an in-depth study of nominal genericity in Russian, see Seres (2020).

¹⁹Therefore, it makes sense that they are bare in a language like Czech. But this can hardly be taken for a significant achievement of the present analysis, as all theories known to me predict the same.

Many interesting issues remain open, among them the status of so-called weak definites (as in *go to the store*), which are also expressed by bare NPs in Czech and which have been argued to be kind-denoting at some level of representation (Aguilar-Guevara & Zwarts 2011). Weak definites are interesting in that they do not satisfy – or at least not in any immediately obvious sense – the uniqueness presupposition (one can *go to the store* even if there are multiple stores around). I believe that the present analysis might offer an insight into this issue, namely by letting the inherent uniqueness presupposition be restricted by an appropriate conversational background. More particularly, the quantification could be over situations restricted by a bouletic conversational background (ordering source), i.e., one related to wishes or intentions, and include only situations in which there is a single store (because one wants or intends to go to just one).

5.2 Anaphoric NPs

There is a clear tendency in some Slavic languages to use demonstrative (rather than bare) NPs for discourse anaphora. This is illustrated for Czech in (21). For parallel facts from Serbo-Croatian, see Arsenijević (2018).

- (21) *Chytil jsem brouka. {Ten brouk / #Brouk} má velká kusadla.*
 caught be.AUX.1SG bug DEM bug bug has large fangs
 ‘I caught a bug. The bug has large fangs.’

In Šimík (2016), I followed Elbourne (2008) and Schwarz (2009) and proposed that the anaphoric function of demonstratives is due to their syntactic and semantic structure, which is a proper superset of that of a definite article. Without intending to argue against this view, I would like to suggest that the analysis in terms of accidental uniqueness provides us with an alternative view (a detailed comparison is left for another occasion).

It seems clear that discourse anaphoric demonstrative NPs have to rely on discourse representation in one way or another. Normally, this is achieved by equating the reference of the demonstrative NP with the reference of some other referent mentioned in previous discourse. Suppose, however, that the coreference is achieved indirectly – via situations. The idea is that anaphoric NPs take the discourse situation, name it s_D , as their resource situation.²⁰ Consider now the accidental uniqueness presupposition in (22), predicted by my analysis for the

²⁰Notice that what is relevant here is the resource situation of the demonstrative NP, based on which the relevant presupposition is defined. The topic situation might well be disjoint from the discourse situation.

second sentence of (21). It states that there is exactly one bug in the discourse situation and that it is not the case that all situations that are like the discourse situation are such that they have exactly one bug in them. The former conjunct seems to be satisfied. The latter conjunct is the crucial one: it implies that if one attempts to generalize over discourse situations, one fails to find one particular referent in them. That sounds plausible to me. Individual discourse situations have very different and often unpredictable properties. Unless one considers a very ritualized discourse situation (such as a wedding ceremony, perhaps), it is hard, if not impossible, to find a discourse situation which would always and reliably contain one particular referent. In other words, discourse referents are always accidentally unique and the use of a demonstrative NP is predicted.

$$(22) \quad \exists!z[\text{BUG}(s_D)(z)] \wedge \neg \forall s[s \approx s_D \rightarrow \exists!x[\text{BUG}(s)(x)]]$$

5.3 Non-specific NPs

So far I have dealt with bare NPs that refer to entities in the topic situation, i.e., entities that are assumed or even presupposed to exist by the speaker or all discourse participants. But bare NPs also have non-specific uses. In this subsection, I briefly consider the semantics of bare NPs in the scope of negation and of intensional verbs and will show that my analysis accommodates bare NPs that are either (i) not associated with (inherent) uniqueness at all or (ii) associated with inherent uniqueness in non-actual situations.

Example (23a) involves a bare NP in the scope of negation. In the present approach, outlined in §3.3.1, “indefinite” bare NPs receive the same baseline semantics as the “definite” ones discussed up to now. The only difference is that the NP or, more precisely, the choice function in its semantic representation, is not interpreted relative to the topic situation, but relative to a situation whose existential closure is in the scope of negation.²¹ By assumption, the choice function is in the scope of the situation binder, resulting in the truth-conditions in (23b)/(23c).²² Note that the “indefinite” use is possible because the inherent uniqueness associated with “definite” bare NPs is not hardwired into the semantics of bare NPs. It is just a pragmatic option.

²¹Although different in technical detail, this analysis is very similar in spirit to Geist’s (2015) situation-based semantic analysis of Russian genitive of negation. Czech has no productive genitive of negation; accusative objects, as in (23a), exhibit (albeit optionally) a non-specific construal.

²²The assumption that the choice function co-scopes immediately below the situation binder derives the traditional observation that “indefinite” bare NPs always take narrow scope (see e.g. Dayal 2004; Geist 2010; cf. Borik 2016).

- (23) a. *Mirek nenamaloval obraz.*
Mirek NEG.painted painting
‘Mirek didn’t paint any painting.’
b. $\lambda s. \neg \exists s' [s' \leq s \wedge \exists f [\text{PAINTED}(s')(f_{s'}(\text{PAINTING}))(\text{MIREK})]]$
c. The set of situations s with no subsituation s' such that there is a choice function selecting a painting (in s') that Mirek painted in s' .

Consider now example (24), containing the bare NP *tabuli* ‘blackboard’, which corresponds to a definite description in the English translation. This NP is “non-specific” in that the blackboard only exists in the belief-situations of the former teacher Jan. This is captured in the present analysis by having the choice function (and hence the blackboard) relativized to the situation variable bound by the intensional verb and by having the choice function existentially bound in its scope – in line with what I have assumed so far. What is more interesting is the issue of uniqueness. In my intuition, the utterance is associated with inherent uniqueness, as one would expect from the fact that a bare NP is used. The intuition is that the inherent uniqueness inference remains a pragmatic presupposition on the part of the speaker (or the discourse participants), although it is modally subordinated to the perceived belief of Jan. In other words, the speaker believes that in all the situations that are like the utterance/topic situation as perceived by Jan there is a single blackboard in those situations. Very informally, the speaker assumes that Jan imagines that he is in an ordinary classroom, which in turn entails the stereotypical presence of a single blackboard. This presupposition is formalized in (24d), where s_0 is a situation variable bound by the speaker’s belief (left implicit), so that $\text{DOX}_{\text{JAN}}(s_0)$ is Jan’s doxastic state as perceived by the speaker, and s'_T is a counterpart of the actual topic situation (encoded by the COUNTER relation) in Jan’s beliefs. Inherent uniqueness is then relativized to this imagined topic situation.

- (24) *Situation:* Jan, a former teacher, visits his former classroom, which no longer happens to be one, and gets carried away by memories. He starts scribbling on the wall. An observer comments:
a. *Jan si myslí, že píše na tabuli.*
Jan REFL thinks that writes on blackboard
‘Jan thinks that he’s writing on the blackboard.’
b. $\lambda s. \forall s' [s' \in \text{DOX}_{\text{JAN}}(s) \rightarrow \exists f [\text{WRITE}(s')(f_{s'}(\text{BLACKBOARD}))(\text{JAN})]]$
c. The set of situations s such that all situations s' compatible with Jan’s beliefs in s are such that there is a choice function that selects a blackboard in s' and Jan writes on that blackboard in s' .

$$\text{d. } \forall s [s \in \text{DOX}_{\text{JAN}}(s_0) \rightarrow \exists s'_T [s'_T \leq s' \wedge \text{COUNTER}(s'_T, s_T) \wedge \\ \forall s' [s' \approx s'_T \rightarrow \exists ! x [\text{BLACKBOARD}(s')(x)]]]]$$

To sum up, what I called here “non-specific” NPs support the view that inherent uniqueness is not a conventional component of bare NPs. First, there are bare NPs that trigger no presupposition whatsoever (so-called “indefinite” NPs); second, embedded bare NPs which correspond to definite NPs give rise to a pragmatic inherent uniqueness presupposition (just as their unembedded counterpart), relativized to what the speaker believes about the attitude holder beliefs.

6 Summary and outlook

Based on the analysis of referential bare and demonstrative NPs in Czech, I proposed that two types of uniqueness need to be distinguished: inherent uniqueness and accidental uniqueness. The type of uniqueness is defined relative to the resource situation of NPs, building on insights from situation semantics, and is formalized in terms of Kratzer’s (1981; 1991) modal semantics. A referent of an NP is inherently unique if all situations that are like the resource situation have exactly one entity that satisfies the NP restriction; it is accidentally unique otherwise. I argued that referential bare NPs convey inherent uniqueness and demonstrative NPs convey accidental uniqueness and proposed a syntax and semantics for these two types of NPs in Czech.

The present paper offers a novel perspective of two traditionally distinguished classes of non-deictic referential NPs. Contrary to the traditional view, recently reinforced by much formal literature, according to which bare NPs are reserved for situational uniqueness and demonstrative NPs for anaphoricity, the present proposal cuts the pie differently – into two types of uniqueness. And, as I suggested in §5, the anaphoric function might just be a special case of accidental uniqueness. Future research might show whether the analysis can be extended to other Slavic languages or even the weak vs. strong definite article contrast in languages like German. Another direction for future research consists in determining whether the concept of accidental uniqueness and the associated situational uniqueness uses of demonstrative NPs might form a bridge for the grammaticalization or diachronic development of the demonstrative into the definite article.

Abbreviations

1	first person	INSTR	instrumental
AUX	auxiliary	REFL	reflexive
DEM	demonstrative	SG	singular
IMP	imperative		

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Chapter 15

The role of the correlate in clause-embedding

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This contribution analyzes cataphoric and anaphoric correlates in contemporary German and Russian. It concentrates on their role in the reference to finite clauses. On the basis of a minimalist conception of sound-meaning correlation and discriminating between Semantic Form and Conceptual Structure, lexical entries for correlates and lexical heads are presented with special emphasis on the syntactic and semantic functions of dependent clauses. In addition to the nominalizing function of the cataphoric correlates, two templates are proposed to accommodate embedded clauses to their respective role as modifiers or as arguments.

Keywords: anaphors, cataphors, demonstratives, embedded clauses, modifiers, adjunct clauses, adverbial clauses, argument clauses, semantic accommodations, c-selection, s-selection

1 Introduction

The main concern of this contribution is the role of demonstrative pronouns with regard to embedded clauses. In many languages, the embedding of clauses can be connected with the presence of a cataphoric demonstrative pronoun.¹ In German, this is the neuter pronoun *es* ‘it’ or its suppletive definite determiner

¹See Pütz (1986); Sudhoff (2003; 2016); Mollica (2010); Willer-Gold (2013); Schwabe et al. (2016); Bondaruk (2015); Knjazev (2016); Zimmermann (1967; 1983; 1993; 2016a,b; 2018a; 2019b). Correlates and clause integration in the history of German is/was discussed by Axel (2009); Axel-Tober (2011).



forms *dessen*, *dem*, *da(r)*, and in Slavic languages like Russian, the various case forms of the demonstrative pronoun *to* ‘that’ are used.²

The corresponding anaphoric correlate is *éto* ‘this’. In German, the neuter personal pronoun *es* ‘it’, its suppletive forms, or the demonstrative *dies-* ‘this’ can refer to previously mentioned clauses. It will be shown which morphosyntactic features characterize these pronouns and to which meaning components they correspond. I will concentrate on non-/anaphoric definite demonstrative elements ([+def,+dem,±anaph]) in D (see (21)). Specificity, uniqueness, deixis, and exhaustivity are left aside.³ At first, cataphoric correlates will be inspected.

- (1) a. *Wir werden es berücksichtigen, dass der Professor schlecht hört.*
 we will it.ACC take.into.account that the professor badly hears
 (German)
- b. *My učëm to, čto professor ploxo slyšit.* (Russian)
 we take.into.account.PFV it.ACC that professor badly hears
 ‘We will take it into account that the professor is hard of hearing.’
- (2) a. *Man muss dem (, dass Peter faul ist)_α zustimmen (, dass Peter faul*
 one must it.DAT that Peter lazy is agree that Peter lazy
ist)_{-α}. (German)
 is
- b. *Nado soglasit’sja s tem, čto Pëtr lenivyj.* (Russian)
 necessary agree with it.INS that Peter lazy
 ‘One has to agree that Peter is lazy.’

German and Russian behave differently with respect to extraposition of the embedded clause/CP. In Russian – like in other Slavic languages – the CP can remain within its nominal or prepositional shell.⁴ In German, on the other hand, the pronoun *es* ‘it’ requires to be exhaustively dominated by DP, without any co-constituent, as is the case in (1a). This is a phonological peculiarity of this item, listed in its lexical entry (see (21a)). The suppletive forms of *es* do not exhibit this peculiarity; see (2a). Extraposition of CP takes place for phonological and/or

²German suppletive *da(r)* needs a preposition to its right as phonological host (see the analysis in Breindl 1989).

³See Schwarz (2009), Šimík (2016), Bombi (2018), and Borik (2019) on these issues.

⁴In Croatian, this is always the case. There is no extraposition of the embedded clause (see Willer-Gold 2013).

computational reasons and is not visible semantically. It is due to the heaviness of CP and related to processes of performance. I treat it as an operation on the level of PHONOLOGICAL FORM (PF). In the syntactic base, the correlate and the embedded clause constitute a complex entity, undergoing compositional semantic interpretation.⁵

The respective forms of the correlate as well as the syntactic and semantic types of the embedded clause are determined by the embedding lexical head – verbs as in (3)/(4), adjectives as in (5)/(6), and prepositions as in (7)/(8).^{6,7}

- (3) a. *es sehen, dass / ob / wer / wie ...* (German)
 it.ACC see that if who how
 ‘see it that/whether/who/how ...’
- b. *sich dafür, dass / ob / wer ... interessieren*
 REFL DEF.for that if who be.interested
 ‘be interested in it that/whether/who ...’
- c. *daran, dass / ob ... zweifeln*
 DEF.at that if doubt
 ‘doubt about it that/whether ...’
- d. *sich danach, ob / wer ... erkundigen*
 REFL DEF.after if who inquire
 ‘inquire about it whether/who ...’
- e. *es verlangen, dass ...*
 it.ACC demand that
 ‘demand that ...’
- f. *es jemandem gefallen, dass / wer ...*
 it.NOM somebody.DAT like that who
 ‘like it that/who ...’

⁵In contrast to Haider (2010: 233ff.), who considers extraposed argument clauses to be base-generated as right sisters of V, I assume that the correlate and its dependent CP are basically co-constituents of a DP (see (6)).

⁶In German, the lexical heads V and A are XP-final, in Russian they are XP-initial. Nouns deserve a special treatment (see below). See Knjazev (2016) who raises fundamental questions with respect to nominalizations.

⁷In (3)–(8), the pronoun *wer/kto* ‘who’ represents clauses with initial w/k-phrases. Note that *wie/kak* (‘how’)-clauses can be embedded by predicates of perception (see Zimmermann 1991), and that all subjunctions in (7)/(8) introduce adverbial clauses.

- (4) a. *videt' to, čto / li / kto / kak ...* (Russian)
 see this.ACC that if who how
 'see it that/whether/who/how ...'
- b. *interesovat'sja tem, čto / li / kto ...*
 be.interested.REFL this.INS that if who
 'be interested in it that/whether/who ...'
- c. *somnevat'sja v tom, čto / li ...*
 doubt.REFL in this.LOC that if
 'doubt about it that/whether ...'
- d. *osvedomljat'sja o tom, li / kto ...*
 inquire.REFL about this.LOS if who
 'inquire about it whether/who ...'
- e. *trebovat' togo, čtoby ...*
 demand this.GEN that.SBJV
 'demand that ...'
- f. *to, čto / kto ... nravit'sja komu*
 this.NO that who like.REFL who.DAT
 'like it that/who ...'
- (5) a. *davon, dass / ob / wer ... abhängig ...* (German)
 DEF.of that if who dependent
 'dependent on it that/whether/who ...'
- b. *darüber, dass / wer ... froh ...*
 DEF.about that who happy
 'happy about it that/who ...'
- c. *es ... erforderlich, dass ...*
 it.NOM/ACC necessary that
 'it ... necessary, that ...'
- (6) a. *zavisim- ot togo, čto / li / kto ...* (Russian)
 dependent of this.GEN that if who
 'dependent on it that/whether/who ...'
- b. *rad tomu, čto / kto ...*
 happy this.DAT that who
 'happy about it that/who ...'

- c. *neobxodimo to, čtoby ...*
 necessary this.NOM that
 ‘it ... necessary, that ...’
- (7) a. *nachdem ...* (German)
 after.this.DAT
 ‘after ...’
 b. *damit ...*
 DEF.with
 ‘in order to ...’
 c. *deswegen, weil ...*
 this.GEN.because.of because
 ‘for the reason that ...’
 d. *indem ...*
 in.this.DAT
 ‘by ...’
- (8) a. *posle togo, kak ...* (Russian)
 after this.GEN how
 ‘after ...’
 b. *dlja togo /s tem, čtoby ...*
 for this.GEN with this.INS that.SBJV
 ‘in order to ...’
 c. *po tomu, čto ...*
 through this.DAT that
 ‘for the reason that ...’
 d. *tem, čto ...*
 this.INS that
 ‘by ...’

The morphosyntactic dependence between the head and the cataphoric correlate and the embedded clause is government. The governor licenses its dependents by feature sharing. The respective heads of the dependents bear morphosyntactic features in their lexical entries, case features of the correlate, and clause type features in C of the embedded clause.⁸ The governor with corresponding features

⁸Case features are [\pm governed, \pm oblique] and [\pm R(ichtung), \pm U(mfang), \pm P(eripherie)] for German (see Bierwisch 1967) and for Russian (see Jakobson 1936; 1958), respectively. Subclassi-

associated with the respective argument positions c-selects its dependents by licensing their features (see Zimmermann 1990; 2013; Pitsch 2014a,b).

The embedded clause/CP gets a nominal shell by means of the correlate, a case-marked DP, and thus becomes opaque for extractions. Furthermore, the correlate allows marking the respective complement as part of the discourse and as ingredient of information structure (see the comprehensive treatment of Willer-Gold 2013).

Concerning the interrelation between the cataphoric correlate and the embedded clause, it is not a priori clear whether the two parts c- or s-select each other, how the correlate combines with the various clause types syntactically and semantically, and whether the correlate has anything to do with the function of determiners. It will be shown what it means to supply embedded clauses with nominal character and how the embedded CP gets the status of an adnominal modifier. In this connection, a comparison is made between DPs with a pronominal head and DPs with a determiner and a lexical head regarding their role in the embedding of clauses. The following considerations are a contribution to the ongoing discussion concerning the question whether all embedded clauses have the status of relative clauses, i.e. of predicate expressions.⁹

2 The analysis

My considerations are built on a conception of minimalism (see Chomsky 1995; 2001) and on the central role of the lexicon as the interface of different levels (see Zimmermann 1987; Jackendoff & Audring 2019).

2.1 Syntax

For the syntax of finite root and embedded clauses, I assume the following structural domains:

fying features of C are [–interr(ogative),–dir(ective)] for *dass/čto* ‘that’, [+subj(unctive)] for *čtoby* ‘that; in order to’, [–def(inite),+interr,–wh] for *ob/li* ‘if; whether’, [–def,+interr,+wh] for *wer/kto* ‘who’ in interrogative clauses, [+def,+interr,+wh] for *wer/kto* in emotive and [+def,+interr,αwh] in epistemic contexts, and [+percept(ion)] for *wie/kak* ‘how’. For German V2-embeddings we would have to add [–interr,–dir,+EPP] (Extended Projection Principle), and for languages like Croatian, Bulgarian, and modern Greek, which differentiate between factive and non-factive complementizers, [–interr,–dir,±fact(ive)].

⁹I will only address finite embedded clauses. Infinitival and exceptional case marking (ECM) constructions are neglected. What is noteworthy here is the fact that ECM verbs and verbs with V2-complements do not occur with a correlate. With infinitival clauses, the correlate is optional.

(9) (ForceP) CP – MoodP TP ... AspP vP VP

ForceP introduces the illocutionary operator of root clauses. CP is differentiated by clause-type features (see footnote 8), TP by the tense features $\pm\text{pret}$ $\pm\text{fut}$, and AspP by the aspectual feature $\pm\text{perf}$. The corresponding feature combinations are semantically interpreted and mirrored in the morphological word structure of the inflected verb (Zimmermann 1990; 2013; Pitsch 2014a,b). Depending on semantic scope relations, ‘–’ and ‘...’ in (5) can be specified by further functional categories for information-structural or temporal and aspectual properties, respectively. Whether ForceP is to be analyzed as being composed of several layers in order to integrate various types of sentence adverbials is a matter of ongoing discussion (see, a.o., Krifka 2021).

As to the syntax of DPs, it is assumed that D can be occupied by various types of determiners and pronouns. The cataphoric correlate has an obligatory clausal dependent whilst the corresponding anaphoric pronouns *es/das*, *dessen*, *dem*, *da(r)* in German and *éto* in its various case forms in Russian occur separately or are accompanied by an apposition. (6) represents the corresponding syntactic configurations. (I assume that the German adverbial form *da(r)* is base-generated in D and raised to P.)

- (10) a. $\left[\text{XP } X_{\alpha} \left(\left[\text{PP } P \right]_{\beta} \left[\text{DP } \left[\text{D}' \left[\text{D } \{ \{ \text{es/das} \}, \text{to}, \emptyset \} \right] \right] \text{CP} \right) \left(\right)_{\beta} X_{-\alpha} \right]$
 b. $\left[\text{XP } X_{\alpha} \left(\left[\text{PP } P \right]_{\beta} \left[\text{DP } \left[\text{DP } \left[\text{D}' \left[\text{D } \{ \{ \text{es/das} \}, \text{éto} \} \right] \right] \left(\right) \right]_{\beta} \left(\text{CP} \right) \right] X_{-\alpha} \right]$

The correlate in (10a) functions as a cataphoric entity and is characterized as a determiner with an additional position for an explicative modifier (CP) (it will be shown in §2.4 that a zero correlate is necessary in many cases). X is the governing lexical head with a PP- or DP-complement and an embedded clause located in SpecDP where it is accessible for government by P or X.¹⁰ The governing c-selectional properties of X concern the preposition or the case of the DP and the syntactic type of the embedded CP. The analysis proposed in (10a) guarantees that the pertinent governed constituents are accessible for the governor independent from one another.

It deserves mentioning that idiosyncratic PPs and DPs with lexical cases can be omitted such that the embedded CP appears directly associated with the governing head; see (7) (for structural, lexical, and inherent cases see Smirnova & Jackendoff 2017). Predominantly, this is the case whenever the correlate does not

¹⁰For other proposals and on the distribution of the accusative correlates *es* and *das* see Axel-Tober et al. (2016). For reasons of space, I will not discuss the peculiarities of this analysis.

signal givenness. The possible omission is considered a PF-operation. Evidently, the omission of idiosyncratically governed PPs or DPs with the correlate requires previous extraposition of the embedded CP.

- (11) a. *Man muss* ([_{DP} [_{D'} *dem*]]) *zustimmen, dass Peter faul ist.* (German)
 one must this.DAT agree that Peter lazy is
 b. *Nado soglasit'sja* ([_{PP} *s* [_{DP} [_{D'} *tem*]]]) *, čto Pětr lenivyj.*
 necessary agree with this.INS that Peter lazy
 ‘One has to agree that Peter is lazy.’ (Russian)

In (8) it is shown that the relative pronoun *dem* and the PP *s čem*, respectively, must be present in order to refer to the coreferential clause.¹¹

- (12) a. *Peter ist faul_i, *(dem_i) man zustimmen muss.* (German)
 Peter is lazy this.DAT one agree must
 b. *Pětr lenivyj_j, *(s čem_i) nado soglasit'sja.* (Russian)
 Peter lazy with what.INS necessary agree
 ‘Peter is lazy, on which one has to agree.’

The same is true for corresponding interrogative pronouns as in (9)¹² and for anaphoric pronouns relating to clausal antecedents as in (10).¹³

¹¹In [Willer-Gold \(2013\)](#), I found many continuative appositives like *što umoguće da ...* ‘what makes possible that ...’, *na što ukazuje ...* ‘to what points ...’, *što je u skladu s ...* ‘what is in harmony with ...’, *što znači da ...* ‘what means that ...’, *iz čega izlazi ...* ‘from what follows ...’, *zbog čega ...* ‘since ...’, *nakon čega ...* ‘whereafter ...’, etc.

¹²Strangely, the German interrogative pronoun *was* does not have a dative:

- (i) *{*Wem / welchem Urteil} muss man zustimmen?* (German)
 who.DAT which judgement.DAT must one agree
 ‘On which judgement must one agree?’

¹³So-called echo-questions (see [Beck & Reis 2018](#)) require the unreduced form of embeddings:

- (i) a. *Nado soglasit'sja (s tem), čto Pětr lenivyj.* (Russian)
 necessary agree with this.INS that Peter lazy
 ‘It is necessary to agree (on it) that Peter is lazy.’
 b. **(S čem) nado soglasit'sja?*
 with what.INS necessary agree
 Intended: ‘On WHAT is it necessary to agree?’

- (13) *S čem nado soglasit'sja?* (Russian)
 with what.INS necessary agree
 'On what must one agree?'
- (14) a. *Peter ist faul_i. Dem_i muss man zustimmen.* (German)
 Peter is lazy this.DAT must one agree
 b. *Pëtr lenivyj_j. S ètim_i nado soglasit'sja.* (Russian)
 Peter lazy with this.INS necessary agree
 'Peter is lazy. One has to agree on this.'

The pronouns in (8)–(10), which all refer to clauses, cannot be left out of consideration when it comes to the characterization of the c- and s-selectional properties of the pertinent matrix predicates as well as to the treatment of the correlate with regard to its role in nominalizing embedded clauses (see Zimmermann 2019b).

2.2 Semantics

Whereas c-selection has to do with the morphosyntactic compatibility of constituents, s-selection concerns their semantic interrelation. First of all, semantic typing of lexical and syntactic components belongs to s-selection. I assume the following elementary semantic types: *e* for individuals, *i* for time spans, *d* for degrees, *t* for propositions, *s* for worlds, and *a* for illocutionary acts (see Krifka 2004). All other semantic types are composed of these differentiations. Many heads are multifunctional as to their s-selectional properties (see (22)).¹⁴

As for the semantic type of embedded clauses and the pronouns referring to them, there is much discussion in the literature (see below; within inquisitive semantics, see Roelofsen 2019; Theiler et al. 2018). I shall assume the following:

¹⁴Whilst *wissen* 'know' – except for cases like *(k)eine Antwort/Lösung wissen* '(not) know an answer/a solution' – takes only propositional objects, *sehen* 'see' is compatible with propositional and individual objects. Both verbs can combine the propositional object with a correlate. In contrast, *kennen* 'know (of)' must be accompanied by the correlate when it takes a propositional object; see (i).

- (i) a. *Ich weiß ({es / das}), dass Marienkäfer beißen.* (German)
 I know it this that ladybugs bite
 'I know that ladybugs bite.'
 b. *Ich kenne *({es / das}), dass Marienkäfer beißen.*
 I know it this that ladybugs bite
 'I am familiar with the fact that ladybugs bite.'

relative and adverbial clauses are predicates of type $\langle et \rangle$, $\langle it \rangle$, $\langle tt \rangle$, $\langle st \langle t \rangle \rangle$, or $\langle st \rangle$, while complement clauses are of type t or $\langle st \rangle$. As in [Brandt et al. \(1992\)](#) and [Zimmermann \(1993; 2009\)](#), interrogative w/k-clauses and *ob/li*-clauses – being introduced by a question operator – are of type $\langle st \rangle$ and have a special semantic structure representing focus and background (see [Krifka 2001](#)).

In general, I distinguish between grammatically determined SEMANTIC FORM (SF) and CONCEPTUAL STRUCTURE (CS) (see [Bierwisch & Lang 1987](#); [Bierwisch 2007](#); [Lang & Maienborn 2011](#)). Unbound variables are parameters which are specified or appropriately bound in CS. Where necessary, semantic type shifts apply in the course of semantic amalgamation of constituents. In this paper, two predicate makers will play a role (see below).

Possible-world semantics discriminates between propositions p of type t and world-related propositions $\lambda w.p(w)$ of type $\langle st \rangle$. A world w is considered as a mental reflection by a human being of the world w_u in which (s)he exists. Therefore, the illocutionary operator of declarative root clauses (DECL) – associated with the meaning postulate (MP) in (12) – will be represented as in (11).

$$(15) \quad \llbracket \emptyset_{+Force} \rrbracket = \lambda p.DECL \ p \in \langle st \langle a \rangle \rangle$$

$$(16) \quad \forall p.DECL \ p \rightarrow \left[\left[EXPRESS(p)(sp) \right] \wedge \left[\left[HOLD(\exists d \llbracket [d = N] \wedge \right. \right. \right. \quad (MP1) \\ \left. \left. \left. [CERTAIN(p)(d)] \right) \right](sp) \right] \wedge \forall w \llbracket [w \subseteq w_{sp}] \rightarrow p(w) \rrbracket \right]$$

The MP in (12) derives the mental fact that in declarative clauses the speaker – by expressing p – considers it certain that p is true in their world. Furthermore, I propose the MP in (13): For positive attitudinal and emotive predicates, it derives the general fact that the holder of the attitude or emotion is to some degree certain that $p_{[-interr-dir]}$ is true in their world (see footnote 8 as to clause-type features).

$$(17) \quad \forall p_{[-interr-dir]}. \forall x. \exists P_{att/emot} \left[\left[P_{att/emot}(p)(x) \right] \rightarrow \quad (MP2) \right. \\ \left. \left[\left[HOLD(\exists d \llbracket [(d) R(N)] \wedge [CERTAIN(p)(d)] \right) \right](x) \right] \wedge \forall w \llbracket [w \subseteq w_x] \rightarrow p(w) \rrbracket \right] \\ R \in \{=, <, >, \dots\}, \text{ depending on } P_{att/emot}$$

Both MP's characterize the speaker of declarative clauses and the subject of attitudes and emotions, respectively, as judge for the truth of a proposition such that (s)he is certain or believes that p is true in her/his world. The semantic component CERTAIN is connected with a degree argument d , which in the default case

has a norm value. The value for the relational parameter R in (13) depends on the respective attitudinal or emotive verb.

2.3 Lexical entries

The lexicon plays a crucial role in the sound meaning correlation of constituents (see Zimmermann 1987; 2018b). Every lexical entry (except for zero morphemes) contains the phonological characterization, the morphosyntactic categorization, and the grammatically determined semantic form of the relevant lexical item. As regards morphology, I adhere to an approach according to which the lexicon brings in fully derived and inflected word forms (see, a.o., Zimmermann 1987; 1988; 1990; 2013; 2018b; Wunderlich 1997; Pitsch 2014a,b).

2.3.1 The correlate

With regard to correlates referring to clauses, some general considerations on demonstratives and their relation to definite determiners are in order (see, a.o., Fabricius-Hansen 1981; Schwabe 2013; Schwabe et al. 2016). Languages differ with respect to the explicitness and the linear order of these two elements. Furthermore, it must be clarified by which morphosyntactic features they are characterized and to which meaning components of the respective pronouns these features correspond.

I assume that definiteness corresponds to the operator in (18a), which is equivalent to (18b), where P_1 is the – possibly unspecified – restrictor while P_2 is the nucleus.

- (18) a. $(\lambda P_1).\lambda P_2.\exists!x[[P_1(x)] \wedge [P_2(x)]]$
 b. $(\lambda P_1).\lambda P_2[P_2(\iota x[P_1(x)])]$

For Russian as an articleless language, I assume a zero determiner D with the SF in (19). It is anonymous as to definiteness and delivers a term without a binder of x . It will be specified depending on the respective context.

- (19) $\lambda P_1.\lambda P_2[[P_1(x)] \wedge [P_2(x)]]$

The features [+demonstrative,+anaphoric] correspond to a predicate $\lambda x[Q(x)]$ with a parameter Q . The latter is specified on the level of CS, hence depends on the linguistic or extralinguistic context.

The cataphoric correlate has the features [+def,+dem,–anaphoric] and the meaning of the definite determiner with a complex restrictor composed of a modificandum (P_1) and a modifier (Q). The meaning of the cataphoric correlate is

given in (20) with an obligatory modifier. Q is a predicate to be specified by the meaning of an embedded CP, which will, if necessary, be accommodated to the semantics of a relative clause.

$$(20) \quad (\lambda P_1).\lambda Q.\lambda P_2\left[P_2(\iota x\left[[P_1(x)] \wedge [Q(x)]\right])\right]$$

In complementary distribution to this specification, we get the semantic representation of the anaphoric pronouns *das* or *dies-* in German and *ëto* in Russian when the predicate Q remains unspecified in SF. Thus, the anaphoric parameter Q and an embedded relative clause are treated as being in complementary distribution, semantically.¹⁵

Fundamental for my approach is the assumption that operators like $\exists!$ or ι can combine with variables of all types, not only with x_e .

The lexical entry for the German and Russian nominative and accusative cataphoric correlates is given in (21).

- (21) a. $/\{\{es_\alpha/das\}/to/\emptyset\}/, ([DP __])_\alpha$
 b. $[+D, +def, +dem, -anaph, \beta given, -I, -II, -pl, -fem, -masc,$
 $\{\gamma governed, -oblique/\gamma R, -P, -U\}]$
 c. $(\lambda P_1).\lambda Q.\lambda P_2\left[P_2(\iota x\left[[P_1(x)] \wedge [Q(x)]\right])\right]$
 $Q, P_1, P_2 \in \langle \delta t \rangle, \delta \in \{t, st, e, i\}$

The correlate *es* ‘it’ cannot be accented and is a complete DP phonologically. This peculiarity is represented in (21a) (as to the zero correlate in (21a), see §2.4.) It implies that the explicative CP cannot be its co-constituent in PF. Therefore, in German, the CP must undergo extraposition. The correlates in (21) are characterized as ι -bound demonstrative determiners which are used cataphorically (not anaphorically).¹⁶

¹⁵ $[\alpha def, +interr]$ -pronouns belong to the same distributional class. They are treated as definite or indefinite Ds with a complex restrictor consisting of $[P_1(x) \wedge Q(x)]$, where Q will be bound by the existential operator or a question operator, depending on the value of the feature $[\alpha def]$.

¹⁶When the correlates in (21) are used anaphorically, the predicate variable Q in (21c) remains unspecified. Typically, this is the case with German *dies-* and Russian *ët-*; see (i).

- (i) a. *Dass der Professor schlecht hört, {das / dieses Problem} werden wir berücksichtigen.*
 that the professor badly hears this this problem will we respect
 (German)
 b. *Čto professor ploxó slyšit, {ëto / ëtu problemu} my učëm.* (Russian)
 that professor badly hears this this problem we respect.PFV
 ‘That the professor is hard of hearing, {it/this problem} will be respected by us.’

They require an attribute $[Q(x)]$ and express a generalized quantifier with a parametric restrictor P_1 and the nucleus P_2 . The feature $[given]$ must not necessarily be specified as $[+given]$. Often the correlate simply serves to embed clauses into DPs. (As an aside note, in German linguistics practice, correlates without anaphoric function are called “placeholders”. In Zimmermann (2019b), I combine the feature $[+given]$ with a special qualification in the semantics of the correlate, which is not considered here.) Observe that predicates with idiosyncratically governed PP- or DP-arguments cannot embed clauses without nominal shells, irrespective of whether these arguments are or are not given.

In contrast to DPs like in $[_{DP} [_D \text{ das}] [_{NP} \text{ Haus}]] / [_{DP} [_D \text{ \acute{e}tot}] [_{NP} \text{ dom}]]$ ‘the/this house’, correlates have no NP-complement in syntax. The restrictor P_1 remains unspecified.¹⁷ Thereby, the cataphoric definite determiner co-occurs with the explicative CP to its right in SpecDP (see (10a)). Both constituents can be governed by predicate expressions or prepositions from the outside. This guarantees that the DP as an argument expression gets case and the propositional adjunct can be selected for its clause type. (Clause types are discriminated by features in C (see footnote 8).)

2.3.2 Governing predicates

In order to illustrate the relation between a lexical governor and the governed constituents within a complex DP with a correlate the following lexical entries will be represented (see Zimmermann (2016b: 42–45).):

- (22) a. $/\{\text{zufrieden}/\text{dovolen}_\alpha\}/$
 b. $[+V, +N, (-\text{fem}, -\text{neuter}, -\text{pl})_\alpha]$

¹⁷Unbound variables like P_1 in (21c) enter the conceptual interpretation of linguistic expressions as parameters and can be specified by suitable predicates or are existentially bound. A very general specification would be Kratzer’s (2016) predicate $\lambda x.[\text{THING}(x)]$ (see footnote 20). Bondaruk et al. (2017: 67) show that the correlate *to* ‘this’ in Polish can be replaced with the noun *fakt* ‘fact’. Mollica (2010: 2.4) presents a comprehensive investigation on Italian *il fatto* ‘the fact’ as a cataphoric correlate. It does not necessarily signal factivity of the embedded CP, as in (i). French *fait*, Spanish *hecho*, and Croatian *činjenica* (all: ‘fact’) behave alike.

- (i) a. *Insist-o su-l fatto che tu venga.* (Italian, Mollica 2010: 240)
 insist-1SG ON-DEF fact that you come.SBJV
 b. *Ich besteh-e dar-auf, dass du komm-st.* (German)
 I insist-1SG it-on that you come-2SG
 ‘I insist that you come.’

- c. $(\lambda d).(\lambda x_{[\{mit/+R+P-U\};(-interr-dir/+def+interr+wh)]) . \lambda z[[(d) = (N)] \wedge$
 $[CONTENT-WITH(d)(x)(z)]]$
 $CONTENT-WITH \in \langle d \langle \beta \langle et \rangle \rangle \rangle, \beta \in \{e, st\}$

This entry characterizes the emotive adjective as a comparable predicate with three argument positions. The internal arguments d and x can remain unspecified. When x will be specified it is marked by the preposition *mit* in German and with the instrumental case in Russian. The governed CP in SpecDP can be a clause with the complementizer *dass*/čto ‘that’ or with a definite w/k-phrase in SpecCP. All features in the index of λx serve the c-selection of the governed dependents.

Semantically, the internal argument x of the adjective *zufrieden/dovolen* ‘content’ can be a [(P) DP] like *mit der Arbeit/rabotoj* ‘with the work’ of type e or a [(P) [D’ CP]] like *damit, dass er Arbeit hat/tem, čto on imeet rabotu* ‘with it that he has work’ or like *damit, wer Arbeit bekommen hat/tem, kto polučil rabotu* ‘with it who got work’ of type $\langle st \rangle$. The corresponding semantic types are s-selected by the pertinent lexical governor. Thus, I treat the adjective as multivalent with respect to its combinatory possibilities.

- (23) a. $/\{Frage_{\alpha}/vopros_{\beta}\}/$
 b. $[+N, -V, \alpha fem, \beta masc, -pl, \{\gamma governed, -oblique/\gamma R, -P, -U\}]$
 $\alpha = + \rightarrow \beta = -, \beta = + \rightarrow \alpha = -$
 c. $\lambda x_{[-def+interr]} [QUESTION(x)] \in \langle et \rangle$

The content nouns *Frage/vopros* ‘question’ express predicates of type $\langle et \rangle$ and can be used as nominal lexical heads in DPs with predicative or non-predicative function (see below). The c-selectional restrictions associated with the argument position λx concern the status of x as the external argument of the noun and are inherited automatically when the argument is realized as modifier of the noun.

The copula is represented in (17). It is a verb maker as it introduces the eventuality argument e , which is a basic component of verbs. Russian has a zero copula in the present tense.

- (24) a. $/\{sein/\{byt'/\emptyset\}\}/$
 b. $[+V, -N, -fin, -part]$
 c. $\lambda P_{[\beta V \gamma N]} . \lambda x . \lambda e[(e) INST [P(x)]] \in \langle at \langle \alpha \langle et \rangle \rangle \rangle$
 $\alpha \in \{st, t, e, i, \dots\}, \beta = + \rightarrow \gamma = +$

The c-selectional condition associated with the predicate position λP of the copula prohibits its combination with verb phrases. With respect to s-selection, the

copula has a multivalent external argument x . This is shown by the possible values of α .

2.4 The semantics of DPs with a correlate

The correlates in (21) are characterized as definite demonstrative determiners with a possibly unspecified restrictor P_1 combined with an obligatory modifier Q . Syntactically, this modifier is embedded as specifier of DP in order to be accessible for its lexical governor (see (10a)). Semantically, Q – like P_1 and P_2 – is a predicate of x , which is bound by the ι -operator. The semantic representation of the embedded CP being the governed clausal dependent of the lexical head must be accommodated in order to function as predicate Q . We must get something like (25a) for Q as a predicate applying to x . This results in the attribute in (25b). Two different predicate makers seem necessary, where the relational variable R is specified in different ways.

- (25) a. $\lambda y [y R [\llbracket \text{CP} \rrbracket]] (x)$
 b. $[x R [\llbracket \text{CP} \rrbracket]]$

2.4.1 Two type shifts

2.4.1.1 A conservative predicate maker

The following type shift, a conservative predicate maker, delivers a predicate $\langle \alpha t \rangle$, which preserves the semantic type of the input, α (Zimmermann 2016a). It is the simplest way to get a predicate – by identifying one entity with another one of the same type. Such semantic representations can equivalently be reduced. And it is for this possibility of reduction that non-given DPs with the correlate seem to be semantically pleonastic.

- (26) $\lambda z. \lambda y [y = z] \in \langle \alpha \langle \alpha t \rangle \rangle, \alpha \in \{st, \dots\}$ (TS_{PM1})

This type shift converts the semantic representation of clauses into predicates with the help of the identity functor. By applying (18) to the semantic interpretation of the embedded CP we get $\lambda y [y = \llbracket \text{CP} \rrbracket]$. (19) shows the result, with (18) applied to the semantic representation of the embedded clause *dass/wer ... / čto/kto ...* ‘that/who ...’ of type $\langle st \rangle$ in SpecDP, (21c) for the correlate in D, and (22c) for the lexical head A *zufrieden/dovolen* ‘content’ of the APs in (27a) or (27b), respectively.

- (27) a. $[\text{AP} [\text{PP mit } [\text{DP } [\text{D}' da] \text{ CP}]] \text{ zufrieden}]$

- b. $[_{AP} \text{dovolen } [_{DP} [_{D'} \text{tem}] \text{CP}]]$
 ‘content with’

$$\begin{aligned}
 (28) \quad & \llbracket \{\text{damit zufrieden, dass/wer ... / dovolen tem, čto/kto ...}\} \text{ ‘content with} \\
 & \text{that/who ...} \rrbracket = \text{22c} \left(\text{21c} (\text{18} (\llbracket \text{CP} \rrbracket)) \right) = \\
 & \lambda x [_{\{\text{mit/+R+P-U}\}; (-\text{interr-dir/+def+interr+wh})}]. \lambda z \left[[(d) = (N)] \wedge \right. \\
 & \left. [\text{CONTENT-WITH}(d)(x)(z)] \right] \\
 & \left(\lambda Q. \lambda P_2 \left[P_2 (\iota x \left[[P_1(x)] \wedge [Q(x)] \right]) \right] \left(\lambda z. \lambda y [y = z] (\llbracket \text{CP} \rrbracket) \right) \right) \equiv \\
 & \lambda z \left[\left[(d) = (N) \right] \wedge \left[\text{CONTENT-WITH}(d)(\iota x \left[[P_1(x)] \wedge [(x) = \llbracket \text{CP} \rrbracket] \right])(z) \right] \right] \\
 & \in \langle et \rangle
 \end{aligned}$$

The ι -operator as a multifunctional binder is not restricted to arguments of type e .¹⁸ In the context of the emotive predicate *zufrieden/dovolen* ‘content’, it binds x of the accommodated $\llbracket \text{CP} \rrbracket$ and characterizes the internal argument x of the adjective as definite. What the semantic amalgamation in (19) shows is that the semantic type $\langle st \rangle$ of its operand $\llbracket \text{CP} \rrbracket$ is preserved by template (18). The only semantic contribution of the correlate consists in delivering a nominal argument, in making a referent definite, and in introducing the parameter P_1 .

As will be shown in §2.4.2, the type shift (18) applies also to embedded clauses of predicates of saying and believing when they are introduced by the correlate (Zimmermann 2016a,b; 2019a).¹⁹ Without the correlate, they are normal propositional complements. Thus, *Frage/vopros* ‘question’ as content noun of type $\langle et \rangle$

¹⁸See Zimmermann (2016b), where it is shown that the pronoun *es* ‘it’ can refer to entities of various semantic types. Multifunctionality is also assumed for w/k-pronouns and for anaphoric pronouns like *das/ěto* ‘this’ (Zimmermann 2019b).

¹⁹In Zimmermann 2016b: 33, I proposed the SF in (i) for the cataphoric correlate:

$$(i) \quad \lambda y. \lambda P. \exists! x \left[[x = y] \wedge [P x] \right] \in \langle t \langle \langle tt \rangle t \rangle \rangle$$

Here, the identity functor figures in the restrictor of the operator and there is no modifier. Thereby, the representation is not comparable with constructions where the restrictor is realized by an NP and accompanied by a modifier as in the following examples. By the treatment of the correlate in the present analysis, this drawback is overcome. If in (21c) the restrictor P_1 in CS will be specified by $\lambda x [x = z]$, one gets – with the help of type shift (18) – the meaning $\lambda y. \lambda P [P(\iota x \left[[x = z] \wedge [x = y] \right])] \text{ and by reduction } \lambda y. \lambda P [P(\iota x [x = y])]$, which amounts to the solution in Zimmermann 2016b: 33.

combines with a propositional argument or modifier only if it has the suitable type $\langle et \langle t \rangle \rangle$ or $\langle et \rangle$, respectively. The corresponding verb *fragen/sprašivat* ‘ask’ embeds interrogative complements of type $\langle st \rangle$.

2.4.1.2 A conversative predicate maker

Another accommodation of embedded clauses is proposed by Kratzer (2006; 2015; 2016); Moulton (2014; 2015; 2017); Hanink (2016); Bogal-Albritten & Moulton (2018). The authors speculate that complement clauses in general – being accommodated to predicates – have the status of relative clauses.²⁰ Instead of their type shift for embedded clauses, I propose the version in (20) (see Zimmermann 2016a; 2018a; 2019a,b):

$$(29) \quad \lambda z. \lambda y [\text{CONSIST-IN}(z)(y)] \in \langle st \langle et \rangle \rangle \quad (\text{TS}_{\text{PM2}})$$

In contrast to template (18), this type shift delivers predicates of type $\langle et \rangle$, changing propositions of type $\langle st \rangle$ to predicates. I propose to apply this template in cases where the restrictor P_1 of the correlate is expressed by content nouns of type $\langle et \rangle$ like *Idee/ideja* ‘idea’, *Plan/plan* ‘plan’, *Frage/vopros* ‘question’, etc. (see Zimmermann 2019a).²¹ The result of applying (20) to the semantic representation of an interrogative clause as modifier of content nouns like *Frage/vopros* ‘question’ together with the cataphoric *t*-operator is shown in (21).

$$(30) \quad \llbracket \{ \text{die Frage}, \{ \text{ob Peter/wer} \} \text{ gewonnen hat} / (\text{tot}) \text{ vopros}, \{ \text{pobedil li Pëtr/kto pobedil} \} \} \text{ ‘the question \{whether Peter/who won\}} \rrbracket =$$

$$\text{21c} \left(\llbracket \{ \text{Frage/ vopros} \} \rrbracket (20(\llbracket \text{CP} \rrbracket)) \right) =$$

$$\lambda P_1. \lambda Q. \lambda P_2 \left[P_2 \left(\lambda x \left[[P_1(x)] \wedge [Q(x)] \right] \right) \right] \left(\lambda y. [\text{QUESTION}(y)] \right)$$

$$\left(\lambda z \lambda y. [\text{CONSIST-IN}(z)(y)] \left(\llbracket \{ \text{ob/wer} \} / \{ \text{li/kto} \} \dots \rrbracket \right) \right) \equiv$$

²⁰See also Arsenijević (2009, 2021 [this volume]) and Caponigro & Polinsky (2011). Within possible-world semantics, Kratzer (2016) proposes the semantic component in (i).

(i) $\lambda p. \lambda x \left[[\text{THING}(x)] \wedge \forall w \left[[(w) \in \text{CONTENT}(x)] \rightarrow p(w) \right] \right]$

Moltmann (2020) presents a new view with regard to the semantic type of embedded clauses as predicates of content-bearing entities. It is based on truth-maker and satisfier semantics rather than possible-worlds semantics.

²¹A thorough comparison of this analysis with the approach of Fabricius-Hansen & von Stechow (1989) requires a special study. The authors assume that content nouns are of type $\langle tt \rangle$.

$$\lambda P_2 \left[P_2 \left(\iota x \left[[\text{QUESTION}(x)] \wedge [\text{CONSIST-IN}(\llbracket \{ob/wer\} / \{li/kto\} \dots \rrbracket (x))] \right] \right) \right] \\ \in \langle et \langle t \rangle \rangle$$

Another realm for the application of type shift (20) are adverbial clauses (Zimmermann 2018a; 2019b,c). For example, final clauses with *damit*, *dass*/⟨*dlja togo/s tem*⟩, *čtoby* ‘with the aim that’ can be interpreted as WITH-THE-AIM-CONSISTING-IN $\llbracket \text{CP} \rrbracket$, where AIM is the specification of the restrictor P_1 of (21c). This is shown in the semantic representation in (23) of the examples in (22).²²

- (31) a. *mit dem Ziel, dass Peter Italienisch lernt* (German)
 with the aim that Peter Italian learns
 b. *s cel’ju, čto=by Pëtr učilsja italjanskomu* (Russian)
 with aim.INS that=SBJV Peter learned Italian
 ‘with the aim that Peter learned Italian’

$$(32) \quad \llbracket \{mit/s\} \rrbracket \left(\textcolor{red}{(21c)} (\llbracket \{Ziel/cel'_{\alpha}\} \rrbracket) (\textcolor{red}{(20)} (\llbracket \text{CP} \rrbracket)) \right) = \\ \lambda e \left[(e) R \left(\iota x \left[[\text{AIM}(x)] \wedge [\text{CONSIST-IN}(\llbracket \text{CP} \rrbracket)(x)] \right] \right) \right] \in \langle et \rangle$$

Here, the adverbializing preposition of semantic type $\langle e \langle et \rangle \rangle$ refers to a relation R between an eventuality e and the complex nominal complement of type e with the correlative determiner, a head noun and its restrictive attribute, the semantically accommodated embedded CP. In Russian, the determiner is represented by a zero correlate (see (21a)).

In parallel to the constructions in (22) with an expressed restrictor – German *Ziel* and Russian *cel’* ‘aim’ –, there are synonymous expressions with the cataphoric correlate and an incorporated component specifying the restrictor (Zimmermann 2019b). This is demonstrated in (24) and (25).

- (33) a. *damit Peter Italienisch lernt* (German)
 so.that Peter Italian learns
 b. *s tem, čto=by Pëtr učilsja italjanskomu* (Russian)
 with it.INS that=SBJV Peter learned Italian
 ‘so that Peter learned Italian’

²²In Russian, the prospectivity of the noun *cel’* ‘aim’ is connected with the subjunctive in the modifying CP. On the morphosyntax and the meaning of the subjunctive/conditional particle *by* see, a.o., Zimmermann (2015).

$$(34) \quad \llbracket \{ \text{damit/s tem}_\alpha \} \rrbracket (20 (\llbracket \text{CP} \rrbracket)) = \\ \lambda e. \left[(e) R \left(\lambda x \left[[\text{AIM}(x)] \wedge [\text{CONSIST-IN}(\llbracket \text{CP} \rrbracket)(x)] \right] \right) \right] \in \langle et \rangle$$

In these examples, the preposition *mit/s* delivers an unspecified relation between the referential argument *e* of the matrix-clause and the argument *x* of the adverbial clause which is characterized as purpose clause by the semantic component AIM, irrespective of whether it is expressed by the noun *Ziel/cel* ‘aim’ as in (22) or incorporated in the meaning of the connective *damit, dass/s tem, čtoby* ‘so that’ as in (24). In both cases, the template (20) accommodates the meaning of the embedded CP of type $\langle st \rangle$ to a modifying predicate of type $\langle et \rangle$.

Content nouns, typically, also occur as predicative expressions that classify nominalized propositions, as shown in (35)/(36) and (37)/(38).

- (35) a. *Ob wir die globalen Probleme lösen können, ist eine komplizierte Frage.* (German)
 if we DEF global problems solve can is a complicated question

- b. *Es ist eine komplizierte Frage, ob wir die globalen Probleme lösen können.*
 it is a complicated question if we DEF global problems solve can

‘Whether we can solve the global problems is a complicated question.’

- (36) a. *Možem li my rešit’ global’nye problemy – složnyj vopros.* (Russian)
 can Q we solve global problems complicated question

- b. *To, možem li my rešit’ global’nye problemy, – složnyj vopros.*
 it can Q we solve global problems complicated question

‘Whether we can solve the global problems is a complicated question.’

- (37) a. *Dass Peter Italienisch lernt, ist unser Ziel.* (German)
 that Peter Italian learns is our goal

- b. *Es ist unser Ziel, dass Peter Italienisch lernt.*
 it is our goal that Peter Italian learns

- (38) a. *Čto=by Pëtr učilsja italjanskomu – naša cel’.* (Russian)
 that=SBJV Peter learned Italian our goal

- b. *To, čto=by Pëtr učilsja italjanskomu, – naša cel’.*
 it that=SBJV Peter learned Italian our goal
 ‘That Peter should learn Italian is our goal.’

These predicates are all of type $\langle et \rangle$. This does not correspond to the type of their propositional subjects. Only when they are accompanied by a correlate and properly accommodated are they of the suitable semantic type, $\langle et \langle t \rangle \rangle$. This means that the propositional subjects in (35a), (36a), and in (37a), (38a) are coerced by a silent nominalizer. It is composed of the zero correlate (21) and the predicate maker (20), as shown in (28).

$$(39) \quad \lambda Q. \lambda P_2 \left[P_2(\iota x [[P_1(x)] \wedge [Q(x)]]) \right] (\lambda z. \lambda y [\text{CONSIST-IN}(z)(y)] ([\text{CP}])) = \\ \lambda P_2 \left[P_2(\iota x [[P_1(x)] \wedge [\text{CONSIST-IN}([\text{CP}])](x)]) \right] \in \langle et \langle t \rangle \rangle$$

Specifying $[\text{CP}]$ by the semantics of the proposition of the subject in (35a), (36a), and (37a), (38a), one gets the nominalized SF in (29). Like the subjects with the correlates in (35b, 36b) and (37b, 38b), it is a suitable argument for the predicates in (35)/(36) and (37)/(38).

$$(40) \quad \lambda P_2 \left[P_2 \left(\iota x \left[[P_1(x)] \wedge [\text{CONSIST-IN}(\{ [\{ ob/li \} \dots] / [\{ dass/čtoby \} \dots] \}) (x)] \right) \right] \right] \\ \in \langle et \langle t \rangle \rangle$$

With the semantics of the copula and the functional categories of the matrix-clause we get (30) as the SF of the examples in (?). The peculiarities of the syntax and semantics of the functional CP-domains need not interest us here (on the syntax see (5)). Attention should be paid to the semantic amalgamation of the copula with the predicative and the nominalized propositional subject.

$$(41) \quad \text{DECL } \lambda w. \exists e \left[[(e) \leq (w)] \wedge \left[[\neg[(t) < (t^0)]] \wedge [\tau(e) \geq (t)] \wedge \right. \right. \\ \left. \left. \lambda z [(e)_{\text{INST}}[[\text{AIM}(z)] \wedge [\text{HAVE}(z)(\iota y [(sp) \in (y)])]]]] \right] \right] \\ \left(\lambda P_2 \left[P_2(\iota x [[P_1(x)] \wedge [\text{CONSIST-IN}([\text{CP}])](x)]) \right] \right) \equiv \\ \text{DECL } \lambda w. \exists e \left[[(e) \leq (w)] \wedge \left[[\neg[(t) < (t^0)]] \wedge [\tau(e) \geq \right. \right. \\ (t)] \wedge \exists! x [[P_1(x)] \wedge [\text{CONSIST-IN}([\text{CP}])](x)] \wedge [(e)_{\text{INST}}[[\text{AIM}(x)] \wedge \\ [\text{HAVE}(x)(\iota y [(sp) \in (y)])]]]] \right] \right]$$

In contrast to (23), where the embedded clause functions as modifier of the content noun *cel'* with the meaning AIM, the accommodated propositional subject in (30) functions as the argument of this noun in predicative function (compare the examples (31b) and (38a)). Nevertheless, in both cases, the embedded CP serves as accommodated predicate of a modifier semantically, namely as $\lambda x[\text{CONSIST-IN}(\llbracket \text{CP} \rrbracket)(x)]$.

As to the substance of the accommodation in (18) and (20), it deserves mentioning that the semantic functors = and CONSIST-IN are very abstract and thereby very similar to pleonastic entities.

Comparing DPs with an accommodated proposition as modifier like in (21) and corresponding copular clauses with a propositional subject and with a content noun as predicate like in (35a) and (38a), respectively, one observes that template (20) delivers modifiers of type $\langle et \rangle$, while the combination of (20) and the correlate (21) serves as nominalizer of propositions and delivers arguments of type $\langle et(t) \rangle$.

2.4.2 Attitudinal verbs with incorporated content nouns

A look at doxastic verbs like *zweifeln an/bezweifeln/somnevat'sja v* 'doubt (about)' allows us to consider the syntactic and semantic types of their propositional internal argument.

- (42) a. *Peter {bezweifelt (es) / zweifelt daran}, dass die Erde rund ist.*
 Peter doubts it doubts it that DEF earth round is (German)
- b. *Pëtr somnevaetsja v tom, čto Zemlja krugla.* (Russian)
 Peter doubt in it that earth round
 'Peter doubts (about it) that the Earth is round.'

In both languages, the embedded clause is of declarative nature. It has to be accompanied by the correlate with governing prepositions. As direct object of *bezweifeln* 'doubt', it can occur without a visible correlate.

In Zimmermann (2019a), I argue that attitudinal predicates embed propositions as in (32).

- (43) a. *Peter {meint / hat die Meinung / ist der Meinung}, dass die Erde flach ist. – {Was meinst du / Welche Meinung hast du / Welcher Meinung bist du}?* (German)
 Peter believes has DEF opinion is DEF opinion that DEF earth flat is what believe you which opinion have you of which opinion are you

- b. *Pëtr dumaet, čto Zemlja ploska. – Čto ty dumaes’?* (Russian)
 Peter believe that earth flat what you believe
 ‘Peter believes that the Earth is flat. What do you believe?’

The doxastic verb *meinen/dumat* ‘believe’ and its periphrastic variants in (43a) are synonymous, and the periphrastic forms are semantically incorporated in the meaning of the verb. The propositional argument position is inherited and constitutes the propositional complement of the verb. This is shown in (33).

$$(44) \quad \llbracket \{ \textit{meinen/dumat} \} \rrbracket = \lambda p. \lambda x. \lambda e \left[(e)_{\text{INST}} \left[\text{HAVE}(\iota y \llbracket \text{BELIEF}(y) \rrbracket \wedge \right. \right. \\ \left. \left. \llbracket \text{CONSIST-IN}(p)(y) \rrbracket \right) \right](x) \right] \in \langle st \langle e \langle et \rangle \rangle \rangle$$

Internal propositional complements of doxastic verbs are transparent for extractions out of the embedded clause. In cases where the propositional complement of doxastic verbs is accompanied by the correlate as in (34) = (31), we get an opaque DP-construction of semantic type $\langle \langle st \langle t \rangle \rangle t \rangle$, as shown in (35).

- (45) a. Peter bezweifelt es, dass die Erde rund ist. (German)
 b. *Pëtr somnevaetsja v tom, čto Zemlja krugla.* (Russian)
 ‘Peter doubts about it that the Earth is round.’

$$(46) \quad \text{DECL } \lambda w. \exists e \left[\left[(e) \leq (w) \right] \wedge \left[\neg \llbracket (t) \leq (t^0) \rrbracket \right] \wedge \left[\llbracket \tau(e) \supseteq \right. \right. \\ \left. \left. (t) \rrbracket \wedge (e)_{\text{INST}} \left[\text{HAVE}(\iota y \llbracket \text{DOUBT}(y) \rrbracket \wedge \llbracket \text{CONSIST-IN}(\iota z \llbracket P_1(z) \rrbracket \wedge \llbracket (z) = \right. \right. \right. \\ \left. \left. \left. (\lambda w'. \exists e' \llbracket \llbracket (e) \leq (w') \rrbracket \wedge \llbracket \neg \llbracket (t') \leq (t^0) \rrbracket \rrbracket \wedge \llbracket \tau(e) \supseteq \right. \right. \right. \\ \left. \left. \left. (t') \rrbracket \wedge (e')_{\text{INST}} \llbracket \text{ROUND}(\iota x \llbracket \text{EARTH } x \rrbracket) \rrbracket \right) \right] \right](y) \rrbracket \right](\text{PETER}) \rrbracket \right]$$

Here, the semantics of the doxastic verb embodies template (20) with the functor *CONSIST-IN*, whilst the correlate in this case is connected with the simpler type shift (18) with the identity functor *=*, namely in order to preserve the type of the embedded proposition (i.e. $z, p \in \langle st \rangle$).

3 Prospects

The present treatment of correlates is semantically flexible and reckons with two type shifts, (18) and (20), to embed a CP as a modifier. It was shown that nominalizing clauses is realized by a special determiner, the cataphoric correlate, which

introduces a modifier position. The approach presupposes multifunctional lexical heads and pronouns as well as different morphosyntactic and semantic types of clauses. As to the question whether there are propositional complements, I tried to show that at least verbs of thinking and saying take propositions of type $\langle st \rangle$ as their complements.

Many problems remain open for future research. In view of the fact that every study is dependent on a current paradigm, it is desirable that it leaves enough room for clarifying unexplained phenomena. First of all, the linguistic description should be as explicit as possible. It should be shown

- which morphosyntactic features and semantic properties characterize the building stones of linguistic expressions;
- what combinatorial properties they have;
- how we account for multifunctionality of expressions and whether it can be reduced;
- which interdependencies exist between the different levels of representation;
- how much syntax is needed for the semantics;
- where zero elements should be substituted by corresponding templates and vice versa;
- what role the lexicon plays in the sound-meaning correlation;
- what insights regarding the embedding of propositions we can gain from other languages.

I hope to have shown that the nominal shells of embedded clauses teach us a lot.

Abbreviations

1	first person	INS	instrumental case
2	second person	PFV	perfective aspect
ACC	accusative case	Q	question particle
DAT	dative case	REFL	reflexive marker
DEF	definite article/determiner	SBJV	subjunctive
INF	infinitive	SG	singular

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Chapter 16

Torlak clitic doubling: A cross-linguistic comparison

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This paper examines the types of clitics and clitic placement in Torlak. This vernacular, spoken in South-Eastern Serbia, also called the Prizren-Timok variety, whose genealogical position is still debatable, requires more attention from the scientific community. In this article, I describe clitic constructions, particularly the ones of clitic doubling and word order in Torlak by presenting data collected in the area of Trgovište and comparing it to the description of Bulgarian provided in [Krapova & Cinque \(2008\)](#). A further crosslinguistic comparison with Serbo-Croatian, Bulgarian, and Macedonian gives an insight into the relatedness of Torlak to the two typologically different areas: a Balkan Slavic and a non-Balkan Slavic one. This is particularly interesting since Torlak has clitic doubling, which makes it similar to Bulgarian and Macedonian, but it has second-position clitics, which makes it similar to Serbo-Croatian, thereby challenging certain cross-linguistic generalizations of [Bošković \(2001; 2004a,b; 2007; 2016\)](#). The overall results allow us to have a clearer picture of the use of clitics in this non-standard variety.

Keywords: clitic doubling, Torlak, cross-linguistic comparison



1 Introduction

Torlak is a dialect spoken in the Southern or Southeastern area of Serbia. It is often called Prizren-Timok dialect to delineate its area in Serbia, despite its distribution in closer areas in Bulgaria and Macedonia as well (Figure ??) and some minor sub-varieties in the inner Bulgaria and Romania.¹

What is relevant is that Torlak contains the majority of features of the so-called Balkan Sprachbund and that there is a high level of microvariation within its area of distribution. It is often disputed by Serbian/Croatian and Bulgarian scholars, who claim that

1. Torlak (Prizren-Timok) is a Shtokavian or a Serbian dialect (Belić 1905; Ivić 1956; Brozović & Ivić 1988, among others),
2. Torlak is a Bulgarian dialect (Stojkov 2002, as one of the most recent studies).

Therefore, its classification remains controversial, having some features in common with Serbo-Croatian and some others with Bulgarian and Macedonian. Despite genealogical issues, this work seeks to provide a valuable contribution in the domain of typology of South Slavic languages.

In this article, I will address two important issues concerning the phenomenon of clitic doubling. On the one hand, I will represent different types of reduplication constructions by confronting Torlak data with the framework illustrated in Krapova & Cinque (2008). On the other hand, I will deal with word order issues and clitic placement in the same structures.

The introductory §2 will discuss the theoretical framework of clitic doubling, address the phenomenon of doubling in Balkan languages, and delineate the methodology and fieldwork conducted in South-Eastern Serbia. §3 will deal with different types of reduplication constructions, mainly based on Krapova & Cinque (2008), and provide evidence from the gathered data. Finally, §4 will carry out a cross-linguistic comparison between Torlak and its surrounding languages, with respect to word order.

¹The areas inhabited by the populations of Gorani and Carashovans are disputed and not always considered as Torlak (Ivić 1956; Browne 1993). I will not refer to these areas in this article. The map in Figure ?? does not represent the current distribution, but it is the closest one.



Figure 1: Distribution of the Torlak dialect (Source: https://upload.wikimedia.org/wikipedia/commons/c/c1/Torlak_dialects_map_en.png)

2 Theoretical framework: The phenomenon of clitic doubling in a nutshell

The phenomenon of CLITIC DOUBLING involves the reduplication of a verbal argument by a clitic pronoun. The doubled argument is usually a full pronoun (1) or a DP (2), or in certain circumstances a CP (3), according to Kallulli & Tasmowski (2008: 1–4), for example:²

- (1) *Mene me boli stomak.*
 Me.ACC me.CL.ACC hurts stomach
 ‘I have stomach ache.’

- (2) *Lo vimos a Juan.*
 Him saw.1PL to Juan
 ‘We saw Juan.’

(Rioplatsense Spanish; Jaeggli 1986: 32)³

- (3) *Ana e_i dinte [CP qe Eva kishte shkuar]_i.*
 Ana.the.NOM 3SG.CL.ACC knew that Eva had left
 ‘Ana knew (it) that Eva had left.’ (Albanian; Kallulli & Tasmowski 2008: 2)

Such patterns have been widely discussed with reference to Romance languages, see, for instance, Jaeggli (1982; 1986); Kayne (1991); Sportiche (1996). Among the mentioned works, the pioneering one is surely Jaeggli (1982) on Rioplatsense Spanish, a language spoken in Argentina, Uruguay, and Paraguay, along with Farkas (1978) and Steriade (1980) on Romanian. Research has shown that both obligatorily demand a construction of doubling, although there are systems in other languages allowing an optional use of it.

Scholars’ opinions have been divided when it comes to the formal description of clitic doubling. On the one hand, some scholars assume that clitics move from an argument position to a derived position, whereas other scholars suggest they are base-generated in their surface position as agreement markers. Sportiche (1996), however, proposes a combination of the two approaches. According to his explanation, pre-existing X^0 elements are directed to a specifier position where they license a feature F , which has to be marked off in a Spec-Head configuration, since the doubled XP^* must move at LF to XP^\wedge position, as indicated in Figure 2.

²If not indicated otherwise, examples are from Torlak.

³The glosses have been slightly modified compared to the original citation.

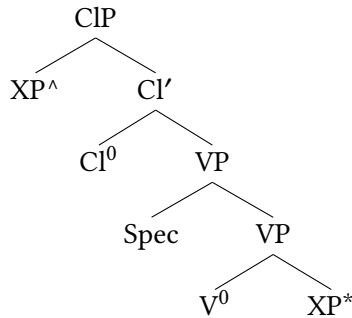


Figure 2: Sportiche's structural analysis of CD (Kallulli & Tasmowski 2008: 6)

In addition, many more recent works deal with the phenomenon of cliticization, such as Roberts (2010), who assumes that a head X^0 is a category which is exclusively dominating itself and claims that clitics do not necessarily need to be part of their host, although they can, or Kramer (2014), who provides different criteria on how to distinguish cliticization from agreement.⁴ I will not insist on any specific theoretical proposal, however, further investigation on cliticization in Torlak might shed light on how this phenomenon works in the grammar.

2.1 Clitic doubling in Balkan languages

Clitic doubling seems to represent an innovation in Balkan languages arisen among the languages themselves, since there is no historical attestation in either Old Church Slavonic or Ancient Greek (Kallulli & Tasmowski 2008: 9). According to certain works, such as Lopašov (1978) and Tomić (2008a,b), there is consistent variation across Balkan languages and even more microvariation within Balkan Slavic. Lopašov (1978) claims that western and southern areas might have strict grammatical constraints which doubling constructions are subject to, whereas northern and eastern areas might use discourse-pragmatic factors to influence CD. Tomić (2008a,b), despite being more focused on Balkan Slavic, provides an illustration of the Balkan dialectal continuum. Doubling appears to show variation across a vertical North-South axis as well as across a horizontal East-West one. Moving North to South, “along with the reduction of the distance between the clitics and the verb, the restrictions on the word classes that can be clitic doubled are relaxed” (Tomić 2008a: 81). Therefore, Serbo-Croatian shows almost no

⁴Roberts (2010: 54), following Chomsky (1995), distinguishes X^0 from X^{\min} ; X^0 being a head itself and X^{\min} consisting merely of features.

traces of clitic doubling constructions, Torlak exhibits a wide usage of accusative doubling and to a lesser extent dative doubling, while Macedonian requires clitic doubling constructions obligatorily with definite direct and indirect objects. As one moves from East to West, “along with the gradual disappearance of the rule for non-occurrence of the clitics in clause-initial position, the restrictions on the environments for clitic doubling are relaxed” (Tomić 2008a: 81).

2.2 Data and methods

The data for this study was collected in the area of Trgovište in South-Eastern Serbia. What is interesting is that the subvariety of Torlak spoken here exhibits overt postposed articles just like Bulgarian and Macedonian (Balkan languages) but unlike Serbo-Croatian (non-Balkan).⁵ In fact, we find:

- (4) *Vide li ga ribarata?*
saw Q him.CL.ACC fisherman.ACC.DEF
‘Have you seen the fisherman?’

The majority of data was collected as free production, particularly due to the age of participants, whose physical conditions did not make specific assignments possible. However, a short elicitation task was done in addition to the free production, with the use of targeted questions, in order to trigger the use of the target word order. Some of the examples can be found in §4.4. The variety of Torlak recorded for this study is specifically relevant due to its geographical position, which is relatively close to both the Macedonian and the Bulgarian border. Therefore, an investigation of contact-induced phenomena might prove fruitful. However, in this article I will focus on a mere comparison of Torlak with its bordering languages.

3 Clitic reduplication constructions

3.1 Relevant background: Krapova & Cinque (2008)

According to Krapova & Cinque (2008), who worked on Bulgarian, clitic doubling cannot be treated as a uniform phenomenon without first mentioning different

⁵Other subvarieties of Torlak might not exhibit overt postposed articles, such as the one analyzed in Runić (2013; 2014).

subtypes of it. As a matter of fact, they identified four divergent subtypes within this macro group. We find:

- HANGING TOPIC LEFT DISLOCATION (HTLD),
- CLITIC LEFT DISLOCATION (CLLD),
- CLITIC DOUBLING PROPER (CD),
- and CLITIC RIGHT DISLOCATION (CLRD).

CD, exemplified in (5), is a construction involving specific groups of predicates, as listed in Krapova & Cinque's (2008) work. For instance, they list psych and physical perception predicates with dative experiencers (e.g. *lipsva mi* 'I miss', lit. 'miss me.DAT'), psych and physical perception predicates with accusative experiencers (e.g. *dostrašava me* 'I am afraid of'), predicates with possessor datives (e.g. *bučat mi ušite* 'my ears ring'), predicates with possessor accusatives (e.g. *varti me ramoto* 'I have a stitch in the shoulder'), predicates in the feel-like constructions (e.g. *iska mi se* 'I feel like'), modal predicates (e.g. *slučva mi se* 'it happens to me'), and predicates indicating presence or absence of something (e.g. *ima* 'there is', *njama* 'there isn't'). Such constructions require obligatory clitic doubling, even in focus movement constructions and allow the clitic's associate to take the stress of the utterance (as new information), to be wh-moved, to be contrastively focused and to be an indefinite quantifier.

- (5) *Ne mu se speše samo na Ivan.*
not him.CL.DAT REFL slept only to Ivan
'Only Ivan didn't feel like sleeping.' (Bulgarian)

CLRD is a complementary structure to CD, but at the same time very different, according to Krapova & Cinque (2008). Namely, as in all of the constructions that will follow, doubling is not obligatory. Furthermore, there are no peculiar constraints in terms of types of predicates used, but the associate correlates with topicality and can neither be wh-moved, constitute contrastive focus, nor contain an indefinite quantifier.

- (6) *Poznavam go tova čuvstvo.*
know.1SG it.CL.ACC this sentiment
'I know this sentiment.' (Bulgarian)

HTLD and CLLD are two additional complementary topic structures which mainly differ in pragmatic properties from the previous two subgroups.

Specifically, HTLD, as clearly stated in the name, creates a general context for the comment from a pragmatic point of view. From a prosodic point of view, instead, there usually is a sharper intonational break between the dislocated element on the left and the rest of the sentence. Here is an example of HTLD in Bulgarian, taken from the corpus presented in [Džonova \(2004\)](#):

- (7) *Tja i bez tova ne moga da ja nakaram da*
she.NOM and without that not can.1SG COMP her.CL.ACC make.1SG to
jade.
eat.3SG
'Her, anyway, I cannot make her eat.' (Bulgarian)

Syntactic properties are the key for distinguishing apparent cases of overlapping between HTLD and CLLD. Namely, as [Krapova & Cinque \(2008\)](#) point out, in case of a dislocated phrase as a simple DP without overt case marking, it is necessary to take into account syntactic properties. The presence or absence of case connectivity effects, that is case matching between the dislocated element(s) and the resumptive one inside the clause, draws a clear distinction between the two subcategories. Case connectivity effects are visible in Bulgarian but only with topicalized pronouns and, accordingly, this feature is absent in HTLD, where a topic simply bears the nominative case. Furthermore, HTLD is more likely to appear only and exclusively in root contexts and its resumptive element can be any DP.

CLLD, on the other hand, requires case connectivity effects to show up mandatorily, unlike HTLD. In addition, it appears both in root and non-root contexts and the resumptive element can only be a clitic.

- (8) *Na Maria njama da i piša az.*
To Maria NEG.will to her.CL.ACC write.1SG I
'To Maria I will not write.' (Bulgarian)

Based on these assumptions, the examples mentioned seem to represent four distinct types of doubling. More examples are to be found in [Krapova & Karastaneva \(2002\)](#) and [Krapova & Cinque \(2008\)](#).

3.2 Evidence from gathered data

Data that I am presenting here was gathered in April 2018 in the area of Trgov-
ište, more precisely in the village Novi Glog, relatively close to the borders to
Macedonia and Bulgaria. Not so surprisingly, many constructions in this dialect
have a very similar, if not identical, structure to Bulgarian and/or Macedonian.
However, my aim here is to examine whether gathered data can meet the re-
quirements presented in *Krapova & Cinque (2008)* and to illustrate any possible
discrepancy.

I will begin with the most characteristic structure in Torlak involving clitic
doubling.

- (9) *Mene me boli stomak.*
me.ACC me.CL.ACC hurts stomach
'I have a stomach ache.'

This appears to be a case of CD and similar examples with tonic pronouns can be
found in Bulgarian as well. What determines the classification of the structure
as the CD subtype is the use of topicalization and a specific verbal construction,
involving a predicate with possessor accusative. Clitic doubling in such construc-
tions is mandatory. Further confirmation of CD can be found in the following
examples using the types of predicates listed in *Krapova & Cinque (2008)*.⁶

- i) psych and physical perception predicates with accusative experiencers

- (10) *Mene me je jat.*
me.ACC me.CL.ACC is anger
'I am angry.'

- ii) predicates in the feel-like constructions

- (11) *Na Marinu gu se spije.*
to Marina.DAT her.CL.DAT REFL sleep.3SG
'Marina is sleepy.'

⁶The indicated interpretation of (12) is not the only possible one. Another possible translation is
'Marina felt better as soon as ...' ('after being sick for days, she felt better'), apart from 'Marina
felt relief (on the soul) as soon as ...'.

iii) predicates with possessor dative

- (12) *Na Marinu gu lkna čim ...*
to Marina.DAT her.CL.DAT felt.relief as.soon.as
‘Marina felt relief as soon as ...’

It is necessary to point out that doubling in Torlak mainly occurs with constructions involving accusative case, whereas there are fewer examples involving dative case. In fact, specific predicates mentioned by Krapova & Cinque (2008), such as *pari mi (na ezika)* ‘my tongue is burning’, are not grammatical in the distinct variety of Torlak analyzed here. CLRD occurs in Torlak as well, being the complementary structure to CD. Indeed, example (6) in Bulgarian has its equivalent formation:⁷

- (13) *Poznavam ga toga čoveka.*
know.1SG him.CL.ACC that man
‘I know that man.’

Other options which are present in Bulgarian, namely HTLD, CLLC, are lacking in Torlak. In fact, the equivalent Torlak examples of (7) and (8), illustrated in Krapova & Cinque (2008), are ungrammatical.

- (14) * *Ona i bez toj ne moga da gu nakaram da jede.*
she.NOM and without that not can.1SG COMP her.CL.ACC make.1SG to eat
Intended: ‘And without that, I could not make her eat.’

- (15) * *Na Mariju nema da gu pišem ja.*
to Maria there.is.not to her.CL.ACC write.1SG I
Intended: ‘To Maria I do not write.’

Torlak, therefore, only partially resembles the well-defined Bulgarian structure.

⁷Torlak does not make a distinction between proximal = V, neutral = T and distal = N articles, as Macedonian does.

4 Clitic word order

The following section presents issues on word order with respect to the phenomenon of clitic doubling. §4.1 presents a theoretical part on generalizations illustrated in Bošković (2001; 2004a,b; 2007; 2016). §4.2 and §4.3 respectively describe all cases of word order involving cliticization in Serbo-Croatian, and Bulgarian and Macedonian, whereas §4.4 provides a general picture of word order in Torlak with respect to the above-listed bordering languages.

4.1 Relevant background: Bošković's generalizations

The basic assumptions for this section mainly involve crosslinguistic generalizations presented in Bošković (2001; 2004a,b; 2007; 2016) and are based on the presumption that languages differ with respect to a number of syntactic and semantic phenomena depending on whether or not they have articles.

Here are the main generalizations, relevant for our word order puzzle:

1. Only languages with overt articles may allow clitic doubling.
2. Second position clitic systems are found only in languages without articles.
3. There is no clitic doubling with second position clitics.

The remaining generalizations provided by Bošković are not relevant for the purpose of this article. I will refer to these generalizations in the following sections, by illustrating clitic constructions involving auxiliary, pronominal, and other types (such as question clitics, e.g. *li*) of clitics in Torlak and its surrounding languages.

4.2 Word order in Serbo-Croatian

Serbo-Croatian has Wackernagel position clitics, according to Franks & King (2000: 217), whereas according to Bošković (2001) and Radanović-Kocić (1988; 1996) SC clitics occur in the second position of their intonational phrase. The following examples seem to merge these two approaches:

- (16) *Olga nam nešto dovikuje.*
 Olga US.CL.DAT something shout.out.3SG
 'Olga is shouting out to us.' (SC)

- (17) *Nešto nam dovikuje.*
 something us.CL.DAT shout.out.3SG
 ‘S/he is shouting out to us.’ (SC; Radanović-Kocić 1988: 105)

However, Franks & King (2000: 219) further specify that “in SC clitics are traditionally described as being able to fall after either the first prosodic or syntactic phrase”. In case of the presence of multiple clitics, the internal organization of the clitic cluster is the following:⁸

- LI (Q) > AUX > DAT > ACC > GEN > SE (REFL) > JE (be.3SG)

In fact, we find the following examples of a maximal projection as in (18) or a prosodic word as in (19).

- (18) [*Ovu zanimljivu knjigu*] *sam joj pročitao.*
 this interesting book AUX.1SG her.CL.DAT read
 ‘I read this interesting book to her.’ (SC; Franks & King 2000: 219)

- (19) [*Anina im sestra*] *nudi čokoladu.*
 Ana’s them.CL.DAT sister offer.3SG chocolate
 ‘Ana’s sister is offering them chocolate.’ (SC; Progovac 1996: 414)

Second position clitics are to be found in different types of configurations: in verb-initial clauses as in (20) and with a clitic in first position as in (21).

- (20) *Dade mi ga Nena.*
 gave.3SG me.DAT it.ACC Nena
 ‘Nena gave it to me.’ (SC; Franks & King 2000: 222)

- (21) *Je li on došao?*
 AUX.3SG Q he come
 ‘Has he come?’ (SC; Radanović-Kocić 1988: 46)

The clitic-first configuration in (20) illustrates one of the two possible exceptions to the second-position placement. Namely, clitics as unstressed particles cannot

⁸ *Je* is an exceptional, yet problematic clitic in SC. It can occur as a 3SG copula/auxiliary but also as a question clitic. Further details can be found in Franks (2017) and Živojinović (2020), among others.

occur in the first position. However, the clitic *je* has a stressed counterpart, making it a non-clitic, according to **Franks & King (2000: 226)**. It is followed by the question clitic *li*, which occurs in the typical second position.

Another apparent exception to the second-position is illustrated in the following example:

- (22) [*Ono najvažnije*] *dade* *mi* *mama*.
 that SUP.important gave.3SG me.CL.DAT mum
 ‘The essential thing I received from mum.’ (SC)

Despite the apparent violation of the second position placement claimed by both **Franks & King (2000)** on the one hand and **Bošković (2001)** and **Radanović-Kocić (1988)** on the other, this example requires a specific intonation and a separation of the initial constituent from the remaining part of the sentence. In this way, this constituent does not violate the second position placement.

This section concludes that there is no evidence for SC to have any other configurations than second-position placement of clitics.

4.3 Word order in Bulgarian and Macedonian

Despite being typologically related, Bulgarian and Macedonian differ with respect to clitic doubling. Namely, they both allow CD but relate to it in a very different manner. Macedonian has obligatory clitic doubling with definite direct and indirect objects, whereas CD in Bulgarian is optional. In fact, as already mentioned above, it is associated with topicality and specificity (**Sportiche 1996; Krapova & Cinque 2008**).

In Bulgarian, clitics precede finite verbs (except when the finite verb is in the first position). This means that clitics can be placed in any position in the sentence, except for the first one; see (23).

- (23) *Vera mi* *go* *dade*.
 Vera me.CL.DAT it.CL.ACC gave.3SG
 ‘Vera gave it to me.’ (Bulgarian; **Franks & King 2000: 234**)

- (24) *Koj kakvo ti* *e* *kazal*?
 who what you.CL.DAT AUX told
 ‘Who told you that?’ (Bulgarian; **Rudin 1988: 461**)

A slightly different configuration can be found in Macedonian. Namely, clitics always precede finite verbs and there are no further restrictions. In fact, unlike Serbo-Croatian and Bulgarian, Macedonian allows first-position clitics as well.

- (25) *Im rekov oti čovekot te videl.*
them.CL.DAT told.1SG COMP person.DEF you.CL.ACC saw
'I told them that the person saw you.'
(Macedonian; Franks & King 2000: 236)

Let us now examine the word order in Torlak.

4.4 Word order in Torlak

When it comes to the variation in clitic placement, Torlak surely stands somewhere in between the above-mentioned possible scenarios. Because Torlak allows clitic doubling, as exemplified in (26), one might be tempted to assume that word order in clitic constructions might resemble either Bulgarian or Macedonian. But let us check some examples and counter-examples:

- (26) *Ti me mene čekaš?*
you.NOM me.CL.ACC me.ACC wait.2SG
'Are you waiting for me?'

Example (27) illustrates the use of a clitic-first construction. Just as in SC, the first-position *je* is stressed and may function as an auxiliary or a copula, or be part of a complex question marker (ex. 27). Therefore, it is not a regular clitic, but is followed by a regular question clitic *li* (shortened *l'*) in the second position.

- (27) *Je l' me mene čekaš?*
be.3SG Q me.CL.ACC me.ACC wait.2SG
'Are you waiting for me?'

- (28) *Mene li me čekaš?*
me.ACC Q me.CL.ACC wait.2SG
'Are you waiting for me?'

- (29) *Ja ga poznavam Milovana.*
I him.CL.ACC know.1SG Milovan
'I know Milovan.'

Unlike examples (28) and (29), example (30) displays a configuration involving a verb-initial construction. Just as in previous cases, the clitic appears in the second position (as in example (27)).

- (30) *Poznavam ga Milovana.*
 know.1SG him.CL.ACC Milovan
 'I know Milovan.'

The following Torlak examples display different configurations suitable for Macedonian, Bulgarian and SC:

- (31) *Milovana ga poznavam.*
 Milovan him.CL.ACC know.1SG
 'I know Milovan.'
- (32) * *Ga poznavam Milovana.*
 him.CL.ACC know.1SG Milovan
 Intended: 'I know Milovan.'
- (33) *Odamna ga upozna Milovana.*
 long.time.ago him.CL.ACC met.1SG Milovan
 'I met Milovan a long time ago.'
- (34) *Odamna ga Milovana upozna.*
 long.time.ago him.CL.ACC Milovan met.1SG
 'I met Milovan a long time ago.'
- (35) *Milovana ga upozna odamna.*
 Milovan him.CL.ACC met.1SG long.time.ago
 'I met Milovan a long time ago.'
- (36) *Milovana ga odamna upozna.*
 Milovan him.CL.ACC long.time.ago met.1SG
 'I met Milovan a long time ago.'
- (37) * *Odamna Milovana ga upozna.*
 long.time.ago Milovan him.CL.ACC met.1SG
 Intended: 'I met Milovan a long time ago.'

- (38) *Toga ga čoveka poznavam.*
that him.CL.ACC man know.1SG
'I know that man.'

It emerges from the above-listed examples that configurations which are allowed in both Bulgarian (see (37) where the clitic is in the third position and precedes the main verbs) and Macedonian (see (32), clitic-first construction) are not acceptable in Torlak. On the other hand, as examples (34) and (36) show, Torlak allows non-verb-adjacent clitics, unlike Bulgarian and Macedonian. Just as Serbo-Croatian, it supports the use of clitics after the first prosodic word (example (38)), following Bošković (2001) and Radanović-Kocić (1988).

How does such evidence relate to Bošković's generalizations? This sub-variety of Torlak seems to fit into Bošković's Generalization 1, mentioned above, but not into the Generalizations 2 and 3. However, the postposition of the article does not seem to be widespread all across the distribution of Torlak. In fact, the Torlak (Prizren-Timok) data presented in Runić (2014) and gathered in the Timok area shows the use of clitic doubling but no overt articles, fitting into Generalizations 2 and 3, but not 1.

5 Conclusion

The theory displayed in Krapova & Cinque (2008) satisfactorily describes the phenomenon of clitic doubling in Bulgarian by identifying four subtypes:

- clitic doubling proper,
- clitic right dislocation,
- hanging topic right dislocation,
- and clitic left dislocation.

However, this branching does not seem to adequately work for Torlak, which adopts the canonical structure of clitic doubling mainly with tonic pronouns, but also with DPs.

Concerning word order, it emerges that, although Torlak allows clitic doubling as Bulgarian and Macedonian, it is closer to Serbo-Croatian, which allows only one constituent to precede the clitic cluster. This specific variety, having post-positioned overt articles, is incompatible with Bošković's generalizations.

Abbreviations

1	first person	DEF	definite article
3	third person	NEG	negation
ACC	accusative case	NOM	nominative case
AUX	auxiliary	REFL	reflexive marker
CL	clitic	SG	singular
DAT	dative case	PL	plural
COMP	complementizer	Q	question particle

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