

Varieties of Collectivity

by

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DEDICATION

To Olga

ACKNOWLEDGEMENTS

This was a long journey and it would not have been possible without the support from so many people. Thanks foremost to my advisors, Chris Barker and Lucas Champollion.

I would have never been able to make it without Chris Barker's devotion and guidance through all these years. Chris's work, teaching, writing, spirit and attitude have never ceased to inspire me.

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ABSTRACT

My dissertation examines the various ways in which a noun phrase can be interpreted collectively. It explores two comitative constructions in Russian that do not exist in English, the *with*-construction and the *together-with* construction, as well as the construction involving the adnominal *vmeste* 'together'. All these constructions are usually interpreted collectively, but I show that their collective interpretation is derived via three different mechanisms.

(1)

a. Masha s Petej ispekli pirog. *with*-construction

M._{NOM} with P._{INST} baked._{PL} pie

'Maria and Peter baked a pie'

b. Masha vmeste s Petej ispekli pirog. *together-with* construction

M._{NOM} together with P._{INST} baked._{PL} pie

'Maria and Peter baked a pie'

c. Masha i Petia vmeste ispekli pirog. adnominal *vmeste*

M._{NOM} and P._{INST} together baked._{PL} pie

'Maria and Peter together baked a pie'

I give a new account of the *with*-construction. I show that the behavior of the *with*-construction cannot be explained by a group approach or treated as a case of *and*-coordination. I propose that the *with*-construction should be analyzed as a case of relational noun coordination. My analysis is based on the idea that the *with*-construction is interpreted as a sum of its individual members that are related to each other via certain relations supplied by the context. My account explains both the long-reported speakers' intuition that this construction is best used when the individuals in question are "somehow related" and the tendency for this construction to be interpreted collectively.

I introduce what I call the *together-with* construction, another comitative construction in Russian, which has not been discussed in the literature before. I show that this construction patterns with group nouns such as *komanda* ('team') and argue that it should be analyzed similarly to them. I propose that the *together-with* construction should be seen as an example of group coordination in the sense of Landman (1989). That is, I claim that the *together-with* construction denotes an impure atom.

I explore the adnominal use of *vmeste* 'together'. Based on its incompatibility with reciprocals and distributive predicates, I argue that noun phrases modified by *vmeste* 'together' should not be viewed as equivalent to any of the above constructions. Rather, the adnominal use of *vmeste* 'together' imposes certain restrictions on verbal events yielding a collective interpretation of the sentence. I claim that adnominal *vmeste*

‘together’ requires that every member of the plurality in question contribute to a verbal event, and that none of these contribution events be in the denotation of the verb.

These three constructions interact differently with different types of predicates: the *with*-construction is compatible with all types of predicates, the *together-with* construction is incompatible with reciprocal predicates, and adnominal *vmeste* ‘together’ is incompatible with distributive predicates or reciprocal predicates. I explain the incompatibility of the *together-with* construction with reciprocal predicates by the atomic nature of this construction. I propose a new meaning for adnominal *vmeste* ‘together’, which explains its incompatibility with reciprocals and distributive predicates.

Finally, I approach various ways to classify collective predicates. In an experimental study, I show that incompatibility with adnominal *vmeste* ‘together’ correlates with covert reciprocity of the predicate, as suggested by Hackl (2002).

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CHAPTER I: INTRODUCTION

My dissertation examines the various ways in which a nominal phrase can be interpreted collectively. Collectivity is sometimes viewed in terms of the presence of certain entailments about a plural entity as a whole, or in terms of the absence of certain entailments about subparts of a plurality, but is rarely precisely defined (for the discussion see Champollion, to appear). Usually, it is implicitly understood to describe interpretations when a predicate applies to a sum (or a group), but not to individual subparts or members of this sum or group. For instance, in *The boys shared a pizza*, the predicate denoted by *share a pizza* applies to the plurality of the boys without applying to the individual boys.

The general assumption in the literature is that collectivity is a unified phenomenon — at least from the point of view of nominal denotation. By contrast, my dissertation works to offer a more nuanced understanding of mechanisms involved in deriving a collective interpretation by relying on Russian data. Insofar as Russian offers a

particularly rich and varied range of nominal constructions, its data can be used for developing more sophisticated models for understanding the logic of collectivity.

Centrally, my dissertation explores two comitative (that is, expressing accompaniment) constructions in Russian that do not exist in English, the *with*-construction (1.1a) and the *together-with* construction (1.1b), as well as the construction involving the adnominal *vmeste* ‘together’ (1.1c). All these constructions are usually interpreted collectively, but I show that their collective interpretation is derived via three different mechanisms.

(1.1)

a. Masha s Petej ispekli pirog. *with*-construction

M._{NOM} with P._{INST} baked._{PL} pie

‘Maria and Peter baked a pie’

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M._{NOM} together with P._{INST} baked._{PL} pie

‘Maria and Peter baked a pie’

c. Masha i Petia vmeste ispekli pirog. adnominal *vmeste*

M._{NOM} and P._{INST} together baked._{PL} pie

‘Maria and Peter together baked a pie’

In Chapter II, I give a new account of the Russian comitative construction (the *with*-construction), in light of the new data I present. This construction is commonly seen as an example of group coordination. The meaning of the *with*-construction has been the subject of a debate opened by McNally (1993) and Dalrymple et al. (1998a). The main question of this debate was whether the *with*-construction should be analyzed as a group or as a sum. I show that the use of the *with*-construction cannot be explained by the group approach. I also show that treating the *with*-construction as equivalent to regular *and*-coordination and taking the sum approach does not yield the desired result either. I offer a new account of the *with*-construction, an account that gives a more detailed understanding of the phenomenon. I propose that the *with*-construction should be analyzed as a case of reciprocal conjunction, similar to relational-noun coordination, as in *husband and wife (to each other)*.

My analysis suggests that the *with*-construction is interpreted as a sum of its individual members that are related to each other via certain relations supplied by the context. To my knowledge, my account is the first one to explain both the long-reported speakers' intuition that this construction is best used when the individuals in question are "somehow related" and the tendency for this construction to be interpreted collectively. For example, speakers tend to interpret (1.1) collectively and report that the use of the *with*-construction likely indicates that Maria and Peter are related to each other (i.e. are *relatives* or *friends*).

I claim that the relatedness requirement triggers the collective interpretation of the construction, which can be achieved via known techniques and operators, Landman's (1996) group operator among them. However, none of these operators is in the denotation of the construction itself, and the construction can be interpreted distributively when certain contextual requirements are met.

After addressing the *with*-construction, I introduce what I call the *together-with* construction (1.1b), another comitative construction in Russian, which has previously escaped scholarly attention. This construction suggests that comitative coordination in general is a more complex phenomenon than previously thought. I show that this construction patterns with group nouns such as *komanda* ('team') and should be analyzed similarly to them. I propose that it is the *together-with* construction that should be seen as an example of group coordination. My discussion reflects the debate on the meaning of the comitative construction: whereas the result of my analysis of the *with*-construction is closer to Dalrymple et al. (1998a), my analysis of the *together-with* construction treats it as an instance of group coordination, in line with McNally's treatment of the *with*-construction (1993).

In Chapter III, I explore the adnominal use of *vmeste* 'together'. Based on its incompatibility with reciprocals and distributive predicates, a phenomenon that has also escaped attention in the literature up to now, I claim that adnominal *vmeste* 'together' should not be viewed as equivalent to either of the above constructions:

adnominal *vmeste* 'together' is not compatible with reciprocals or distributive predicates, whereas the *together-with* construction is compatible with distributive predicates, and the *with*-construction is compatible with distributive and reciprocal predicates. I propose that the adnominal use of *vmeste* 'together' imposes certain restrictions on the events yielding a collective interpretation of the sentence. I claim that the adnominal *vmeste* 'together' requires that every member of the plurality in question contribute to an event, but none of these contribution events is in the denotation of the verb. For example, (1.1c) roughly means that Maria did something that cannot qualify as baking a pie, and so did Peter, but the sum of their efforts was, in fact, a pie-baking event.

In this dissertation, I show that the *with*-construction, the *together-with* construction, and adnominal *together* pattern differently. This indicates that comitatives and structures involving *together* are not as similar as some authors see them. The difference between these two kinds of structures needs to be explained, and my dissertation opens the path to do so.

To summarize, these three constructions, the *with*-construction, the *together-with* construction, and adnominal *vmeste* 'together' are analyzed in three different ways. The *with*-construction is analyzed as a sum of its individual members combined with restrictions on the relations between them. The *together-with* construction is analyzed as

a group of its individual members, that is, as an impure atom. The adnominal *vmeste* constrains certain events from the denotation of the predicate.

These three constructions interact differently with different types of predicates, reciprocal predicates among them. I explain the incompatibility of the *together-with* construction with reciprocal predicates by the group nature of this construction. I propose a new meaning for adnominal *vmeste* ‘together’, which explains its incompatibility with reciprocals and distributive predicates.

In Chapter IV, I approach the interaction of collective predicates and the above constructions, and, in an online survey study, show that the compatibility of a collective predicate with the adnominal *vmeste* ‘together’ correlates with the covert reciprocity of the predicate, as suggested by Hackl (2002) — or, at least, with the ability of the predicate to have atomic subjects.

The overall significance of this work is that I give a more detailed account of the range of comitative constructions a language can have than it has been previously discussed, and develop a more detailed analysis of these constructions. Although the dissertation is based primarily on Russian, the insights this dissertation develops can be relevant to our understanding of comitativity and togetherness crosslinguistically.

The comitative construction (the *with*-construction) is widespread in Slavic languages, such as Russian, Polish (Dyła, 1988), and Czech (Skrabalova, 2003). The comitative construction is also found in Spanish (Camacho, 2000), Latvian (personal

communication with a native speaker) and, further, in Chadic languages, such as Tera and Margi (Hoffman, 1963), or Q'anjob'al (Mayan) (Paperno, 2012). These accounts suggest that my analysis of Russian comitatives extends to other languages.

Comitativity as a phenomenon and, specifically, comitative PPs, are far more widespread across world languages than the comitative constructions I discuss. For English, comitative PPs (*John lifted a piano with Mary*) and comitative *with* are sometimes mentioned in the discussion of *together* and are thought to have the same meaning as *together* (Lasnik, 1990). I do not discuss comitative PPs in this dissertation, but my preliminary observation is that there exists some connection between the comitative constructions I discuss and the comitative PPs discussed by Lasnik.

My dissertation also contributes to the philosophical debate on the nature of group nouns. Ritchie (under review) proposes that these nouns are polysemous between groups-as-one, which are structured wholes, and groups-as-many. The comitative constructions I discuss are clearly related to group nouns, and the distinction between the *with*-construction and the *together-with* construction contributes to this debate.

1.1 Note on terminology

I will employ the classification of predicates discussed in Champollion (to appear). Distributive predicates as in (1.2) are predicates that only allow for a distributive reading and require the equivalence of the sentences as in (1.2b). Collective predicates as in (1.3) are predicates that only allow for a collective reading, the sentences as in (1.3b) never being equivalent. Mixed predicates are predicates that allow for both readings (1.4). All these equivalences have to hold given that we set aside the issue of nonmaximality of definite plurals (see Brisson, 2003, for details).

(1.2)

- a. Distributive predicates: *smile, sing*
- b. The girls smiled. \Leftrightarrow Every girl smiled.

(1.3)

- a. Collective predicates: *gather, meet, be numerous, be a group of two people*
- b. The girls gathered. \nLeftrightarrow *Every girl gathered.

(1.4)

- a. Mixed predicates: *build a raft, paint a wall*
- b. The girls built a raft. \Leftrightarrow Every girl built a raft. *distributive*
- c. The girls built a raft. \nLeftrightarrow Every girl built a raft. *collective*

I will discuss reciprocal predicates or reciprocals, that is, predicates involving reciprocal pronoun *drug druga* (1.5). The most intuitive translation of *drug druga* to English is *each other*.

(1.5)

Devochki uvideli drug druga.

Girls saw.PL each other

‘The girls saw each other’

I assume that the domain of individuals (type e) and the domain of events (type v) are partially ordered by the parthood (\leq) relation and closed under sum formation \oplus (Link, 1983) (1.6a). I take the inclusive view on count nouns (1.6b) and verbs (1.6c), that is, I assume that the plural form essentially means *one or more*. Following Landman (2000), I assume that the domain of events and the domain of individuals are both built from atoms. I also assume Champollion’s (2017) definition of the algebraic closure for partial functions (1.6d).

(1.6)

a. $*P = \{x \mid \exists P' \subseteq P[x = \oplus P']\}$

(The algebraic closure of set P is the set that contains any sum of things taken from P)

b. $\llbracket N_{PL} \rrbracket = * \llbracket N_{SG} \rrbracket$

c. $\llbracket V_{PL} \rrbracket = * \llbracket V_{SG} \rrbracket$

d. $*f = \lambda x: x \in * \text{dom}(f). \oplus \{y \mid \exists z[z \leq x \wedge y = f(z)]\}$

(The algebraic closure of f is the partial function that maps any sum of things each contained in the domain of f to the sum of their values).

Thematic roles formalize the relations between events and individuals (1.7). I assume that thematic roles are functions of type $\langle v, e \rangle$, and thus establish thematic role uniqueness: only one (possibly plural) individual can bear a given thematic role in a given event. I assume that thematic roles are closed under sum formation (1.7a) and are sum homomorphisms with respect to the sum operation (1.7b): a thematic role θ of a sum of two events is the sum of their θ 's.

(1.7)

a. $\theta = *\theta$

b. $\theta(e \oplus e') = \theta(e) \oplus \theta(e')$

I assume that the conjunction of two individuals is their sum, following Landman (1996), as in (1.8a). I will use Landman’s group forming operator \uparrow , which maps (possibly) plural individuals to impure atoms: Landman assumes that collective interpretations use separate entities called groups, which are related to their “underlying sums” via a group forming operator. While sums have proper parts, impure atoms are atoms derived from sums via the group forming operator \uparrow and have no proper parts. Thus, in (1.8), *Mike and Peter* is ambiguous between *Mike-and-Peter-as-a-sum* (1.8a) and *Mike-and-Peter-as-a-group* (1.8b).

(1.8)

$$\text{a. } \llbracket \text{Mike and Peter}_{\text{SUM}} \rrbracket = m \oplus p \quad \text{sum}$$

$$\text{b. } \llbracket \text{Mike and Peter}_{\text{GROUP}} \rrbracket = \uparrow(m \oplus p) \quad \text{group}$$

Finally, I assume the Neo-Davidsonian approach to the representation of the meaning of verbs (1.9) and Champollion (2017)’s event based distributivity operator (1.10).

(1.9)

$$\text{a. } \llbracket \text{stab} \rrbracket = \lambda e. [\text{stab}(e)]$$

$$\text{b. } \llbracket \text{Brutus stabbed Caesar} \rrbracket = \lambda e. [\text{stab}(e) \wedge \text{ag}(e) = b \wedge \text{th}(e) = c]$$

$$(1.10) D_{\theta} = \lambda P_{vt} \lambda e. e \in * \{e' \mid V(e') \wedge \text{atom}(\theta(e'))\}$$

CHAPTER II: THE TWO RUSSIAN COMITATIVE CONSTRUCTIONS

2.1 Overview of the chapter

This chapter provides an analysis of the comitative constructions in Russian. I discuss two constructions that I call the *with*-construction and the *together-with* construction. While the *with*-construction has been discussed before (McNally, 1993; Dalrymple et al., 1998a), alongside with similar constructions in other languages (Polish: Dyła, 1988; Czech: Skrabalova, 2003; Spanish: Camacho, 2000; Q'anjob'al: Paperno, 2012, a.o.), the *together-with* construction has not been previously discussed in the literature. The *with*-construction has become the subject of a debate on whether it should be seen as a group (McNally, 1993) or as a sum (Dalrymple et al., 1998a). I show that these two approaches are, in fact, both legitimate for the analysis of comitative constructions. I claim that the sum approach (Dalrymple et al., 1998a) works best for the *with*-construction, while the *together-with* construction should be analyzed as a group, similar to the analysis proposed by McNally for the *with*-construction.

I propose a compositional analysis of the *with*-construction that treats the construction as relational-noun coordination and, essentially, a sum. This approach explains the similarities between the *with*-construction and bare noun coordination in English: *He had pad and pencil to picture the whole event*. Furthermore, it explains speakers' intuition that the members of the *with*-construction are "somehow related".

The *together-with* construction, in turn, I analyze as involving an atomic group. Similar to group nouns, it can only be the subject of the so-called P-distributivity, but not Q-distributivity, and is not compatible with reciprocal predicates.

The chapter is organized as follows. In section 2.2, I introduce the *with*-construction. In section 2.3, I discuss the sum-group debate on the meaning of the *with*-construction. I describe my analysis of the *with*-construction in section 2.4. In section 2.5, I present a more detailed set of data and discuss contexts that cannot be explained by the theories discussed in section 2.4. Section 2.6 is the formalization of my analysis of the *with*-construction. Section 2.7 is the discussion of the analysis.

In the second part of the chapter, I introduce the *together-with* construction. The *together-with* construction is very similar to the *with*-construction, but has an even stronger tendency to be interpreted collectively. Another difference is that the *together-with* construction is not compatible with reciprocals and certain collective predicates. In section 2.8, I introduce the *together-with* construction and give a detailed empirical picture of the data. Section 2.9 is the analysis of the construction as, essentially, a case of

group coordination. In section 2.10, I discuss the two sides of the McNally/Dalrymple debate on the meaning of the *with*-construction, show how my analysis of the *with*-construction and the *together-with* construction aligns these two constructions on two different sides of this debate, and summarize the chapter.

2.2 The Russian comitative construction (*with*-construction)

The *with*-construction is formed by a noun phrase and a prepositional phrase headed by the preposition *s* ‘with’, which takes an instrumental complement. In the subject position, it triggers plural agreement on the verb, as in (2.1a). The *with*-construction is usually compared to the ordinary *and*-coordinate construction (2.1b) and to VP-adjuncts (2.1c).

(2.1)

a. Petia *s* Mishej poshli *v* park. *with*-construction

P._{NOM} with M._{INST} went._{PL} to park

‘Peter and Mike went to the park’

b. Petia *i* Misha poshli *v* park. *and*-coordination

P._{NOM} and M._{NOM} went._{PL} to park

‘Peter and Mike went to the park’

c. Petia poshel v park s Mishej. VP-adjunct

McNally (1993) shows that the *with*-construction forms a constituent. She lists the following arguments: continuity (2.2), the ability of the *with*-construction to appear in a sentence as the subject, the object and the indirect object (2.3), the inability of the prepositional phrase to be extracted to form a question (2.4), and the ability of the *with*-construction to antecede reflexive pronouns (2.5). The sentences in (2.2) - (2.5) are from McNally (1993).

b. Sobaka pokusala Viktora s Natashej. direct object

dog bit V.ACC with N.INST

‘The dog bit Victor and Natasha’

c. Viktor prodal Borisu s Annoj mashinu. indirect object

V.NOM sold B.DAT with A.INST car.ACC

‘Viktor sold Boris and Anna a car’

(2.4)

*S kem ushli Anna? *extraction

with who.INST left.PL A.NOM?

(2.5)

[Anna s Natashej]₁ videli [sebia]₁ v zerkale. pronoun

A.NOM with N.INST saw.PL self in mirror

‘Anna and Natasha saw themselves in the mirror’

The *with*-construction triggers plural agreement on the verb. This allows us to run the continuity test as in (2.2), since otherwise it would have been indiscernible from the VP-adjunct as in (2.1c).

The *with*-construction is interpreted similarly to *and*-coordination in Russian, with two major differences. First, the *with*-construction strongly prefers a collective interpretation. Thus, (2.6a), when pronounced with no previous context, is most likely interpreted collectively, whereas the distributive interpretation is much harder to obtain. In the case of *and*-coordination (2.6b), the preference for the collective interpretation is not that strong and the sentence can be interpreted distributively.

(2.6)

a. Petia s Mishej napisali pismo.

P._{NOM} with M._{INST} wrote._{PL} letter

Collective: 'Peter and Mike collectively wrote one letter' *strongly preferred*

Distributive: 'Peter wrote letter A, and Mike wrote letter B' *hard to obtain*

b. Petia i Misha napisali pismo.

P._{NOM} and M._{NOM} wrote._{PL} letter

Collective: 'Peter and Mike collectively wrote one letter' *available*

Distributive: 'Peter wrote letter A, and Mike wrote letter B' *available*

Second, the *with*-construction involves some kind of relatedness between the members of the construction or their "togetherness". I will call it the Relatedness

Requirement. McNally gives the example in (2.7). This sentence is best translated to English as *Anna and Peter were sleeping*, and McNally reports that, on initially encountering the sentence, speakers were inclined to assume that Anna and Peter were sleeping in the same room or bed. Further, some speakers thought that the sentence could convey the information that Anna and Peter were somehow related (e.g. as *brother* and *sister*).

(2.7)

Anna s Petej spali.

A.NOM with P.INST slept.PL

'Anna and Peter were sleeping'

In general, the literature (McNally, 1993; Dalrymple et al., 1998a, a.o.) does not specify what “somehow related” and “togetherness” can mean, but describes two particular ways this requirement can be realized: spatiotemporal proximity of the events in question and some sort of relatedness between the members of the *with*-construction.

Spatiotemporal proximity is reported for sentences as in (2.8). (2.8a) is likely to be interpreted as *Peter and Mike entered the classroom simultaneously* and (2.8b) is likely to be interpreted as *At five, Anna and Peter were sleeping in the same room/bed*.

(2.8) Spatiotemporal proximity:

a. Petia s Mishej voshli v klass. *temporal*

P._{NOM} with M._{INST} entered._{PL} in classroom

‘Peter and Mike entered the classroom (simultaneously)’

b. V 5 chasov Anna s Petej spali. *spatial*

At 5 hours A._{NOM} with P._{INST} slept._{PL}

‘Anna and Peter were sleeping at five (in one bed / room)’

Relatedness between the members of the *with*-construction is usually expressed by some relational noun. Speakers report that the *with*-construction in (2.8) can indicate that Anna and Peter are relatives, friends, colleagues, neighbors, etc.

(2.9)

a. Vasia s Petej pechatalis v NLLT, a ja tol’ko v LI.

V._{NOM} with P._{INST} published._{PL} in NLLT, but I only in LI

Collective: ‘V. and P. collectively published in *NLLT* (and I published in *LI*)’ *available*

Distributive: ‘V. and P. each published in *NLLT* (and I published in *LI*)’ *available*

b. Vasia s Petej pechatalis v NLLT.

V._{NOM} with P._{INST} published._{PL} in NLLT

Collective: 'V. and P. collectively published in *NLLT*' *strongly preferred*

Distributive: 'V. and P. each published in *NLLT*'

Fieldwork with native speakers shows that the relatedness requirement can be realized in one more way. Consider the pair of examples from Dalrymple et al. (1998a) in (2.9). Dalrymple lists this pair to show that the *with*-construction does not block distributive readings, contrary to what McNally (1993) claims. My informants confirm that (2.9a) can be interpreted distributively, and some of them specify that it is the contrastive clause *a ja tol'ko v LI* 'but I only in *LI*' that makes the distributive interpretation more available than in (2.9b), which lacks the contrastive clause. That is, (2.9a) gets an interpretation that Vasia and Petia are the only ones who published in *NLLT* (separately) among the three salient participants Vasia, Petia and the speaker. Furthermore, some of my informants report that the *with*-construction in (2.10), that can only allow for a distributive interpretation, can indicate that Peter and Mike are the only Americans in the room.

(2.10)

a. Petia s Mishej iz Ameriki.

P._{NOM} with M._{INST} from America

‘Peter and Mike are from America’

To summarize, the major insights of this section are as follows. The *with*-construction coordinates noun phrases and, in some cases, is interpreted identically to *and*-coordination. It strongly prefers collective interpretation to distributive interpretation. Speakers report that the *with*-construction is best used when there exists some kind of relatedness between the members of the construction or their “togetherness”, i.e. when the Relatedness Requirement is met. I identify three ways the Relatedness Requirement can be met: a) spatiotemporal proximity of the events in question; b) relationship between the participants of the construction, often expressed by a relational noun; c) contrast between the participants of the construction and some other salient individual.

In the following sections, I introduce my analysis of the *with*-construction.

2.3 The sum/group debate on the meaning of the comitative construction

The current debate about the semantic and syntactic status of the *with*-construction was started by McNally (1993). She argues that the *with*-construction and regular *and*-

coordination have different denotations, despite all the similarities between them (2.1). For McNally, *and*-coordination has a sum denotation, while the *with*-construction has a group denotation, in the sense of Landman (1989).

McNally bases her argument on the meaning differences between the *with*-construction and *and*-coordination. She reports (2.11a) as unambiguously collective, while (2.11b) as ambiguous between collective and distributive interpretation.

(2.11)

a. Boris s Petej podnjali rojal. *with*-construction

Boris.NOM with Peter.INST lifted.PL piano

Interpretation: only collective, according to McNally (1993)

b. Boris i Petia podnjali rojal. *and*-coordination

Boris.NOM and Peter.NOM lifted.PL piano

Both collective and distributive, according to McNally (1993)

McNally discusses the Relatedness Requirement, and, for her, it is a conventional implicature that the individuals in the denotation of the construction are “‘groupable’ in some intuitive way”.

McNally's analysis is criticized by Dalrymple et al. (1998a). They reject data like (2.11a) and claim that the *with*-construction may be interpreted distributively, as in (2.9) or (2.12). As a native speaker of Russian, I confirm the judgements provided by Dalrymple et al. (1998a).

(2.12)

Vasja s Petej pomogali pensioneram.

V._{NOM} with P._{INST} helped (old age) pensioners

Distributive: 'Viktor and Peter each helped the pensioners'

Dalrymple et al. (1998a) propose an alternative analysis, in which the *with*-construction and *and*-coordination have the same sum denotation and differ only pragmatically. In their analysis, the sum denotation of the *with*-construction is a more salient referent than the individual denotations of the members of the construction. This salience blocks the application of distributive operators and has the effect that the collective interpretation is the only available. In turn, *and*-coordination does not make the resulting sum salient. Dalrymple et al. conclude that collectivity and distributivity are interpretational properties that depend on the context, not just on the meaning of the conjoined phrase.

Dalrymple et al. (1998a) also discuss the interpretation of the *with*-construction in more complex contexts involving reciprocals, sentence-internal plural *different*, and distributive *po*, and show that the data does not support McNally's claim that the *with*-construction denotes an atomic group.

Importantly, both McNally and Dalrymple et al. discuss the meaning of the *with*-construction, but neither of them offers a compositional analysis of the construction. In turn, my analysis provides a compositional treatment of the construction, and, furthermore, provides an account of the Relatedness Requirement based on independently motivated theories of reciprocal coordination.

2.4 The *with*-construction as relational noun coordination

I propose that the tendency of the *with*-construction to be interpreted collectively is an instantiation of the Relatedness Requirement. Consider the sentence in (2.3) repeated in (2.13). When pronounced with no previous context, (2.13) is most likely to be interpreted collectively, whereas the distributive interpretation is much harder to obtain. In this case, (2.13) can be rephrased as *Peter and Mike helped each other to write a letter* or *Peter and Mike collaborated to write a letter*. That is, Peter and Mike are related due to their participation in writing the same letter.

(2.13) No previous context:

Petia s Mishej napisali pismo.

P._{NOM} with M._{INS} wrote._{PL} letter

Collective: 'Peter and Mike collectively wrote one letter' *strongly preferred*

Distributive: 'Peter wrote letter A and Mike wrote letter B' *hard to obtain*

I propose to analyze the *with*-construction as an instance of relational-noun coordination. That is, I claim that the *with*-construction is an instance of so called reciprocal conjunction or reciprocal plurality (Eschenbach, 1993; Staroverov, 2007), and that the meaning of the *with*-construction is similar to the meaning of expressions like *brother and sister (to each other)*, *father and son (to each other)*, *employer and employee*, etc.

This way to approach the construction explains speakers' intuition that the construction is best used when the participants of the construction are "somehow related", and that this relationship between the participants of the construction is often described by informants as lexicalized by some relational noun (*relative, friend, colleague*, etc.).

The tendency of the *with*-construction to be interpreted collectively can also be expressed in terms of relational nouns. Thus, (2.13) can be rephrased as *Peter and Mike were colleagues in writing a letter*.

The availability of the distributive interpretation of the *with*-construction in cases when the members of the construction are contrasted to some salient individual can be explained in the same way. In (2.9), Vasia and Petia are the only two people who published in *NLLT* among Vasia, Petia and the speaker, who only published at *LI*. (2.10) gets a similar interpretation: Peter and Mike are the only two individuals from America. That is, the members of the *with*-construction can be seen as related if their sum is the maximum plurality in the denotation of the predicate, in the given model.

The *with*-construction is often used to indicate the spatiotemporal proximity of the events in question, as in (2.8). In such a case, the Relatedness Requirement can be expressed as follows: two individuals can be seen as related when they participate in events that have identical spatiotemporal characteristics.

Collectivizing and spatiotemporal uses of the *with*-construction correspond to the meaning of *together*, as observed by Lasnik (1990) (2.14). He also notes that comitative VP-adjuncts have similar meanings (2.15). In the following chapters, I compare *together* (Russian *vmeste*) and the *with*-construction. They do share certain properties, but interact differently with certain predicates, i. e. reciprocals, and therefore should be analyzed differently.

(2.14)

- a. John and Mary lifted a piano together. *collective*
- b. John and Mary sat together. *spatial proximity*
- c. John and Mary stood up together. *temporal proximity*

(2.15)

- a. John lifted a piano with Mary. *collective*
- b. John sat with Mary. *spatial proximity*
- c. John stood up with Mary. *temporal proximity*

The major prediction of the hypothesis outlined in this section is that in sentences where both collective and distributive interpretations are possible in principle, the distributive interpretation should be available only if the Relatedness Requirement is met via some previous knowledge about the members of the *with*-construction (2.16) (cf. (2.13)).

(2.16) Context: *Peter and Mike are brothers*

Petia s Mishej napisali pismo.

P._{NOM} with M._{INS} wrote.PL letter

Collective: Peter and Mike collectively wrote one letter. *available*

Distributive: Peter wrote letter A and Mike wrote letter B. *available*

In the following section I take a more detailed look at the *with*-construction.

2.5 A detailed look at the *with*-construction

2.5.1 The *with*-construction, *and*-coordination and VP-adjuncts

The *with*-construction is often compared to *and*-coordination. However, certain differences exist. First, the *with*-construction can only coordinate nouns and NPs (2.17), whereas *i* 'and' coordinates all kinds of phrases (2.18).

(2.17)

a. Petia s Mishej napisali pismo.

P._{NOM} with Mike._{INST} wrote._{PL} letter

'Peter and Mike wrote a letter'

b. Xudozhnik s poetom voshli v bar.

artist._{NOM} with poet._{INST} entered in bar

'An artist and a poet entered a bar'

(2.18) From McNally (1993): the *with*-construction only coordinates NPs

a. Anna vymyla i / *s narezala ovoshi.

*VPs

Anna washed and / *with cut-up vegetables

'Anna washed and cut up the vegetables'

b. Anna byla vysokaja i strojnaja / *s strojnoj. *APs

Anna was tall.NOM and slender.NOM / with slender.INST

‘Anna was tall and slender’

c. *Boris prigotovil obed i / *s Petja prines vino *Ss

Boris cooked dinner and / *with Peter brought wine.

‘Boris cooked the dinner and Peter brought wine’

Second, *and*-coordination can have both intersective and non-intersective interpretations (2.19). In (2.19a), *i* ‘and’ is interpreted intersectively, and the conjunction *znamenityj sportsmen i chempion* ‘a famous sportsman and champion’ refers to one person who became a father. In (2.19b), *i* ‘and’ is interpreted non-intersectively, and the conjunction *znamenityj sportsmen i televedushaja* ‘a famous sportsman and a female news anchor’ refers to two people who became parents. The *with*-construction can only be interpreted non-intersectively, but not intersectively (2.20). The obligatory plural agreement that the *with*-construction triggers on the verb when in subject position further indicates the inability of the *with*-construction to be interpreted intersectively.

(2.19) *and*-coordination

a. Znamenityj sportsmen i chempion stal otcom.¹ *intersective*

Famous sportsman.NOM and champion.NOM became.SG father

‘A famous sportsman and champion became a father’

b. Znamenityj sportsmen i televedushaja stali roditeljami. *non-intersective*

Famous sportsman.NOM and news-anchor.NOM became.PL parents

‘A famous sportsman and a female news anchor became parents’

(2.20) *with*-construction

a. *Znamenityj sportsmen s chempionom stal otcom **intersective*

Famous sportsman.NOM with champion.INST became.SG father

b. Sportsmen s televedushej stali roditeljami. *non-intersective*

Sportsman.NOM with news-anchor.INST became.PL parents

‘A famous sportsman and a female news anchor became parents’

In the subject position, the *with*-construction is compatible with all kinds of predicates. The *with*-construction is allowed in sentences with distributive predicates

¹ <http://www.starhit.ru/novosti/vozlyublennaya-maykla-felpsa-rodila-emu-syina-122287/?token=710ccd6e48a7da80975e9d4d4b5b0d08>

(2.21a), but in contrast to ordinary *and*-coordination, speakers report that the *with*-construction is best used when the Relatedness Requirement is met.

(2.21) distributive

mixed

a. Petia s Mishej ulybnulis.

b. Petia s Mishej postroili plot.

P._{NOM} with Mike._{INST} smiled._{PL}

P._{NOM} with Mike._{INST} built._{PL} raft

‘Peter and Mike smiled’

‘Peter and Mike built a raft’

In sentences with mixed predicates (2.21b), a collective reading is strongly preferred. If a collective reading is not possible for pragmatic reasons, then a distributive interpretation might be available, but the requirements mentioned above for must be met.

In addition, the *with*-construction can occur with reciprocals and collective predicates (2.22).

(2.22)

a. Petia s Mishej uvideli drug druga.

reciprocal

P._{NOM} with M._{INST} saw._{PL} each other

‘Peter and Mike saw each other’

b. Petia s Mishej vstretilis / gruppā iz dvux chelovek. *collective*
P._{NOM} with M._{INST} met._{PL} / group of two people
‘Peter and Mike met / are a group of two people’

The predicative use of this construction is also possible, with some limitations. In the predicative position, the *with*-construction can easily conjoin relational nouns (2.23a), but regular nouns require further specification of the relationship between the individuals in question. Whereas *muzh s zhenoj* (‘husband with wife’) in (2.23a) means *husband and wife to each other*, (2.23b), *xudozhnik s poetom* (‘artist with poet’) is less acceptable. Intuitively, it is the absence of a salient relation between the artist and the poet in question that makes (2.23b) defective. If such a relation is introduced in a relative clause, for example, the sentence improves (2.23c). As mentioned above, the intersective use of the *with*-construction in the predicative position is not possible (2.24).

(2.23) *predicative*

a. Eti dva cheloveka — muzh s zhenoj. *relational*
these two persons husband._{NOM} with wife._{INST}
‘These two people are husband and wife’

b. ?Eti dva cheloveka — xudozhnik s poetom. *non-relational*

these two persons artist.NOM with poet.INST

Intended reading: ‘These two people are an artist and a poet’

c. Eti dvoe — xudozhnik s poetom, kotorye nenavidjat drug druga.

these two artist.NOM with poet.INST who hate.PL each other

‘These two people are an artist and a poet who hate each other’

(2.24) *intersective*

a. *Etot chelovek — xudozhnik s poetom. **with-construction*

this person artist.NOM with poet.INST

Intended reading: ‘This person is an artist and a poet.’

Finally, the *with*-construction is often compared to comitative VP-adjuncts (2.1). However, the range of uses of the *with*-construction is wider than the range of uses of comitative VP-adjunction: stative predicates tend to disallow comitative VP-adjuncts (2.25), but are fully compatible with the *with*-construction, similar to eventive predicates (2.26).

(2.25) *stative*

a. Petia s Mishej znajut nemetskij. *with-construction*

P._{NOM} with M._{INST} know._{PL} German

‘Peter and Mike know English’

b. *Petia znaet nemetskij s Mishej. *VP-adjunct

P._{NOM} know._{SG} German with M._{INST}

(2.26) *eventive*

a. Petia s Mishej poshli v park. *with-construction*

Peter._{NOM} with Mike._{INST} went._{PL} to park

‘Peter and Mike went to park’

b. Petia poshel v park s Mishej. VP-adjunct

Peter._{NOM} went._{PL} to park with Mike._{INST}

‘Peter went to park with Mike’

2.5.2 The *with*-construction and group terms

Group terms are traditionally seen as having a group denotation, in Landman's (1989) sense. The *with*-construction has been analyzed as having group denotation, due to its tendency to be interpreted collectively, but below I list the differences between group terms and the *with*-construction. These differences pertain to the contrast between so called *P-distributivity* and *Q-distributivity* (Winter, 2001). P-distributivity refers to cases when the distributive effect is achieved as a consequence of lexical properties of the verb, and Q-distributivity refers to cases when there is a scopal element such as a quantifier or a disjunction in the scope of the distributive subject. De Vries (2015) shows that group terms can only be the subject of P-distributivity, unlike plurals, and I will show that the *with*-construction is the subject of both P- and Q-distributivity and patterns with regular plurals in this respect, but not with group terms.

Predicate disjunction is one of the cases that show the difference between the two types of distributivity. Regular plural nouns show both types of distributivity. (2.27a) is an example of P-distributivity, when no quantification over individual children is needed, and the reading is achieved through the lexical meaning of the verb. (2.27b) is an example of Q-distributivity, since the disjunction *singing or dancing* holds of each of the individual children and the reading can only be derived assuming a certain quantificational mechanism, i.e. using a distributivity operator. A Q-distributive

interpretation is not available for group terms (2.28b). Relevantly for us, the *with-* construction patterns with regular plurals in this respect (2.29).

(2.27)

Deti pojut ili tancujut. *plural*

children sing._{PL} or dance._{PL}

a. 'The kids are singing or the kids are dancing' *P-distributivity*

b. 'Each kid is singing or dancing' *Q-distributivity*

(2.28)

Komanda poet ili tancujet. *group*

team sing._{SG} or dance._{SG}

a. 'The team is singing or the team is dancing.' *P-distributivity*

b. '#Each member of the team is singing or dancing.' *#Q-distributivity*

(2.29)

Petia s Mishej pojut ili tancujut. *with-construction*

P._{NOM} with M._{INST} sing._{PL} or dance._{PL}

a. 'Peter and Mike are singing or 'Peter and Mike are dancing' *P-distributivity*

b. 'Peter is singing or dancing and Mike is singing or dancing' *Q-distributivity*

Other examples also indicate that the *with*-construction (2.32) patterns with regular plurals (2.30), but not with group nouns (2.31), with respect to the distinction between Q-distributivity and P-distributivity. For example, (2.30) is ambiguous between (2.30a) and (2.30b). (2.30b) involves quantification over individual children, whereas (2.30a) can be achieved through the lexical meaning of the verb. The *with*-construction (2.32) shows a similar pattern, in contrast to group terms (2.31).

(2.30)

Deti provodiat v shkoleodin den' v nedeliu. *plural*

kids spend.PL in school one day in week

a. 'There is one day a week such that all kids go to school on that day' *P-distributivity*

b. 'For each kid x , there is one day a week y such that x goes to school on y ' *Q-distributivity*

(2.31)

Komanda provodit v shkoleodin den' v nedeliu. *group*

team spend.SG in school one day in week

a. 'There is one day a week such that the team goes to school on that day' *P-distributivity*

b. # 'For each member of the team x , there is one day a week y such that x goes to school on y '

#Q-distributivity

(2.32)

Petia s Mishej provodiat v shkoleodin den' v niedeliu. *with*

P._{NOM} with M._{INST} spend.PL in school one day in week

a. 'There is one day a week such that Mike and Peter go to school on that day' *P-distributivity*

b. 'For each kid x , there is one day a week y such that x goes to school on y ' *Q-distributivity*

The P-/Q-distributivity distinction indicates that the *with*-construction should be interpreted similarly to regular plurals, rather than group terms; that is, the analysis of the *with*-construction should rather take after Dalrymple et al. (1998a) than McNally (1993).

2.6 Analysis of the *with*-construction as relational-noun coordination

The discussion of the *with*-construction has been mostly dedicated to the question of whether this construction denotes a group and only has a collective interpretation, or whether it denotes a sum and is ambiguous between collective and distributive interpretations. However, none of the approaches discuss *how* the meaning of the construction is achieved.

I propose that the *with*-construction conjoins relational nouns. I will use a type shifter π (2.33a) that maps a regular noun onto a relational noun, from the theory of

possessives (Barker, 2011), and treat the *with*-construction as a case of relational noun coordination. To conjoin relational nouns, I will adopt the system proposed by Staroverov (2007). I will use the following type shifters:

(2.33) Type shifters:

- a. $\pi = \lambda P_{et} \lambda x_e \lambda y_e. P(y) \wedge R(x, y)$ (Barker, 2011)
- b. $inv = \lambda Y_{<e, et>} \lambda u_e \lambda v_e. Y(v, u)$ (Staroverov, 2007)
- c. $coll = \lambda R_{<e, et>} \lambda Z_e \exists x_e \exists y_e. Z = x \oplus y \wedge R(x, y)$ (Staroverov, 2007)
- d. $\sqcap = \lambda P_{\sigma t} \lambda Q_{\sigma t}. P \cap Q$ (Winter, 2001)
- e. $ident = \lambda x_e \lambda y_e. y = x$ (Partee, 1986)
- f. $\iota = \lambda P_{et}: |P| = 1. \text{ the unique } x \text{ such that } P(x)$ (Partee, 1986)

In (2.33a), π takes a regular noun (i.e. *artist*) of type *et* as an argument and maps it onto an ordered pair of individuals, of which one is an artist related to the other individual via a relation *R* supplied by the context. Barker (2011) uses π for expressions like *John's cloud*, that is the cloud that John might be watching, painting, or be saliently associated with for some reason.

In (2.33b), *inv* is the operator that inverts a relational noun, and *coll* (2.33c) is what Staroverov calls a 'special collectivity operator'. Whereas *inv* expresses a common

operation, at least in mathematics, *coll* is a purely technical tool Staroverov uses to generate a property (*et*) from a relational noun conjunction.

(2.33d) is intersection, which Winter (2001) assumes to be the meaning of *and*, simplified as in Champollion (2016). I will also use Partee's *ident* (2.33e) and ι (2.33f). *ident* maps individuals to properties, and ι maps a singleton property onto its member.

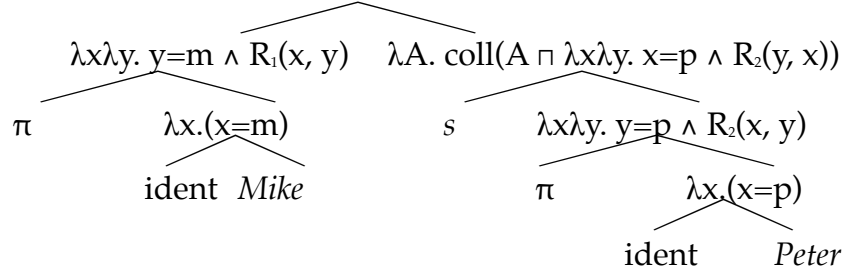
Now, I propose that the *with*-construction is derived as the result of functional application as in (2.34). The meaning of *s* 'with' is in (2.34a). For relational nouns (2.34b), the meaning of the *with*-construction *muzh s zhenoj* 'husband with wife' is identical to the meaning of the reciprocal plurality *muzh i zhena* ('husband and wife (to each other)'). Proper names (2.34c) and regular nouns (2.34d) call for the application of π , which causes the final denotation to require that there exist pragmatically defined R_1 and R_2 between the participants.

(2.34)

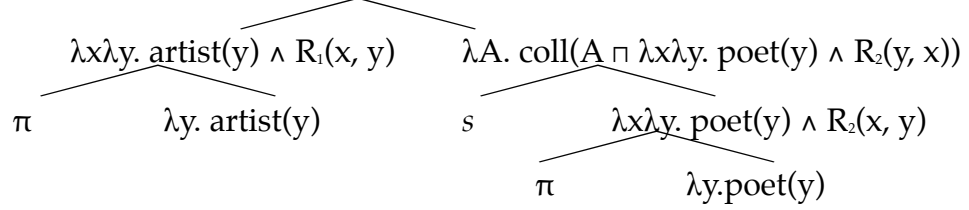
$$\text{a. } \llbracket s \rrbracket = \lambda A_{\langle e, et \rangle} \lambda B_{\langle e, et \rangle}. \text{coll}(B \sqcap \text{inv}(A)) \quad \langle \langle e, et \rangle, \langle \langle e, et \rangle, et \rangle \rangle$$

$$\begin{array}{c} \text{b. } \llbracket \text{muzh s zhenoj} \rrbracket = \lambda X \exists x \exists y. X = x \oplus y \wedge \text{husband}(x, y) \wedge \text{wife}(y, x) \\ \begin{array}{cc} \lambda x \lambda y. \text{husband}(x, y) & \lambda A. \text{coll}(A \sqcap \lambda x \lambda y. \text{wife}(y, x)) \\ & \begin{array}{cc} s & \lambda x \lambda y. \text{wife}(x, y) \end{array} \end{array} \end{array}$$

c. $\llbracket \text{Misha s Petej} \rrbracket = \lambda X. X = m \oplus p \wedge R_1(p, m) \wedge R_2(m, p)$



d. $\llbracket \text{xudozhnik s poetom} \rrbracket = \lambda X \exists x \exists y. X = x \oplus y \wedge \text{poet}(y) \wedge R_1(x, y) \wedge \text{artist}(x) \wedge R_2(y, x)$



The derivation in (2.34) shows that the *with*-construction requires that the members of the construction be related to each other by R_1 and R_2 , which are supplied by the context, except for the cases of relational-noun coordination. The presence of R_1 and R_2 in the derivation guarantees that the Relatedness Requirement be met. A number of strategies discussed in the following section can be chosen by the listener to fulfill this requirement.

2.7 Discussion of the analysis of the *with*-construction

2.7.1 What are the strategies for the Relatedness Requirement to be met?

According to my hypothesis, the *with*-construction is felicitous when the Relatedness Requirement is met. This can be accomplished in more than one way. In Section 2.2 I listed a number of ways for that: a) spatiotemporal proximity of the events in question;

b) certain relationship between the participants of the construction, often expressed by a relational noun; c) a contrast between the participants of the construction and some other salient individual. These ways implicate that there exists some certain background knowledge about the members of the construction and that the members of the construction are related via a certain binary relation (relational strategy), are contrasted to some salient individuals (contrastive strategy), or are spatiotemporally close to each other (spatiotemporal strategy). I claim that the tendency for the *with*-construction to be interpreted collectively is yet another way to meet the Relatedness Requirement (collective strategy).

The collective strategy results in the collective interpretation of the construction. As with *and*-coordination, the collective interpretation is achieved with Landman's (1989) group forming operator \uparrow . Then, the salient relation between the individuals in the denotation of the *with*-construction would be that they are related by the task they participate in collectively. In terms of relational nouns, it can be said that individuals in the denotation of the *with*-construction are colleagues. When the *with*-construction is in the subject position, the relatedness requirement becomes a presupposition, because of the application of ι : $\iota\llbracket\text{Misha s Petej}\rrbracket$ is defined if and only if there exist relations R_1 and R_2 between Misha and Petia.

'Mary and Peter built a raft (together)'

\exists
 ag
 \uparrow
 ι

$\lambda e. \text{build}(e) \wedge \text{raft}(\text{th}(e))$
 $\llbracket \text{M s P} \rrbracket = \lambda X. X = m \oplus p \wedge R_1(p)(m) \wedge R_2(m)(p)$

in terms of relational nouns: $R_1 = R_2 = \lambda x \lambda y. \text{colleague}(x)(y)$

43

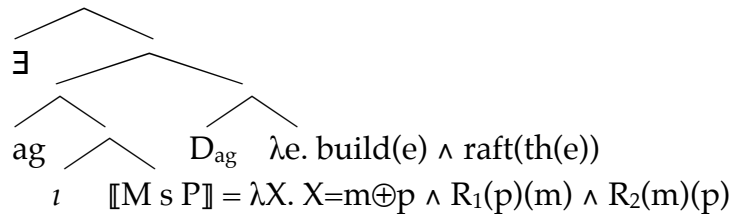
available, too, if the group forming operator \uparrow applies, as in (2.36c). However, the application \uparrow is not necessary, since the Relatedness Requirement is met in another way.

(2.36) Context: Mary is Peter's daughter.

a. Masha s Petej postroili plot.

M._{NOM} with P._{INS} built._{PL} raft

b. $\exists e_1 \exists e_2. \text{build}(e_1) \wedge \text{build}(e_2) \wedge \text{raft}(\text{th}(e_1)) \wedge \text{raft}(\text{th}(e_2)) \wedge \text{ag}(e_1)=m \wedge \text{ag}(e_2)=p \wedge R_1(p)(m) \wedge R_2(m)(p)]$ *distributive*



c. $\exists e. \text{build}(e) \wedge \text{raft}(\text{th}(e)) \wedge \text{ag}(e) = \uparrow[iX. X=m\oplus p \wedge R_1(p)(m) \wedge R_2(m)(p)]$ *collective*

d. Relatedness Requirement: $R_1 = \lambda x \lambda y. \text{daughter}(x)(y)$, $R_2 = \lambda x \lambda y. \text{father}(x)(y)$

The third strategy is the spatiotemporal strategy, which also allows for the distributive interpretation of the *with*-construction, as in the case of distributive *vojti* 'enter' (2.37). The Relatedness Requirement is satisfied by the presupposition that the individuals in the denotation of the *with*-construction participate in some events with

identical spatiotemporal characteristics, namely, the events in the denotation of the sentence. In terms of relational nouns, these individuals can be called companions or fellows. Since *vojti* ‘enter’ is distributive, the distributive interpretation (2.37d) can be derived through a meaning postulate, as in (2.37c) (see Champollion, 2017):

(2.37)

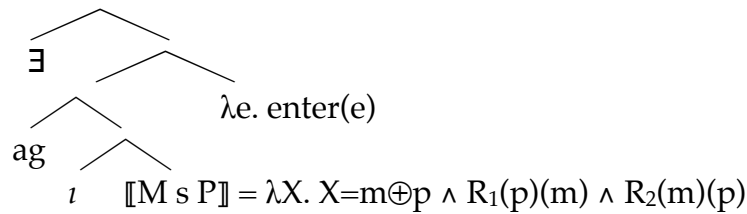
a. Masha s Petej voshli v klass.

M.NOM with P.INS entered.PL in classroom

‘Mike and Peter entered the classroom (together)’

b. $\exists e. \text{enter}(e) \wedge \text{ag}(e) = [iX. X=m \oplus p \wedge R_1(p)(m) \wedge R_2(m)(p)]$

distributive



c. Meaning postulate: *vojti* ‘enter’ is distributive on its agent position

$\forall e [\text{enter}(e) \rightarrow e \in * \lambda e' (\text{enter}(e') \wedge \text{atom}(\text{ag}(e')))]$

d. $\exists e_1 \exists e_2. \text{enter}(e_1) \wedge \text{enter}(e_2) \wedge \text{ag}(e_1) = m \wedge \text{ag}(e_2) = p \wedge R_1(p)(m) \wedge R_2(m)(p)$

e. Relatedness Requirement: $R_1 = R_2 = \lambda x \lambda y \exists e_1, e_2. \text{ag}(e_1)=x \wedge \text{ag}(e_2)=y \wedge \tau(e_1)=\tau(e_2)$

in terms of relational nouns: $R_1 = R_2 = \lambda x \lambda y. \text{companion}(x)(y)$

Finally, the contrastive strategy applies when participants of the construction are contrasted to some salient individuals, as in (2.38). In (2.38), Peter and Mike are related since their sum forms a maximum plurality of those who printed in NLLT. The Relatedness Requirement is met, and the distributive interpretation becomes available (2.38b). The distributive interpretation is true if there exist two in-NLLT-publishing events e_1 and e_2 , such that Peter is the agent of e_1 and Mike is the agent of e_2 .

(2.38) Contrast:

a. Petia s Mishej pechatalis v NLLT, a Anna tol'ko v LI.
 P_{NOM} with M_{INST} published.PL in NLLT, but A_{NOM} only in LI

b. Distributive interpretation:

$\exists e_1, e_2. \text{publish-in-NLLT}(e_1) \wedge \text{ag}(e_1)=m \wedge \text{publish-in-NLLT}(e_2) \wedge \text{ag}(e_2)=p \wedge R_{1,2}(x, y) =$
 $[x \oplus y = \max(X): \exists e': \text{ag}(e') = X \wedge \text{publish-in-NLLT}(e')]$

I still do not fully understand the mechanism of the contrastive strategy and have to leave it for further research. There are two ideas one can pursue towards the analysis of the contrastive strategy. First, Staroverov proposes that two relations allow for reciprocal plurality if and only if they are Strawson-inverse, that is iff $R_1(x, y)$ Strawson entails $R_2(y, x)$ (e.g. *father* and *daughter*, but not *father* and *colleague*).

(2.39) *A* Strawson-entails *B* iff the conjunction of *A* and the presupposition of *B* entails *B*

In (2.38), that Peter and Mike form a maximum plurality of those who printed in NLLT induces an inverse relation on them, but I have not found a way to formalize it.

Second, Sophia Malamud (p.c.) notes that contrast in (2.38) induces a tolerance relation (*publish in the same journal*), where contrasted entities belong to different tolerance neighborhoods, and this can also lead to fulfilment of the Relatedness Requirement.

2.7.2 The Relatedness Requirement: the *with*-construction in the predicative position

The Relatedness Requirement is most evident in the predicative position. Consider the sentences in (2.23), repeated here in (2.40):

(2.40) *predicative*

- a. Eti dva cheloveka — muzh s zhenoj.
these two persons husband.NOM with wife.INST
'These two people are husband and wife'

b. ?Eti dva cheloveka — xudozhnik s poetom.

these two persons artist.NOM with poet.INST

Intended reading: ‘These two people are an artist and a poet.’

c. Eti dvoe — xudozhnik s poetom, kotorye nenavidjat drug druga.

these two artist.NOM with poet.INST who hate.PL each other

‘These two people are an artist and a poet who hate each other’

In (2.40a), the relation between the two people in question is straightforward: R_1 is *husband* and R_2 is *wife*. The Relatedness Requirement is met as the result of the relational strategy. In (2.40c), the relation between the members of the *with*-construction is specified in the relative clause; see the tentative derivation in (2.41). In (2.41), both R_1 and R_2 are *hater (of)*.

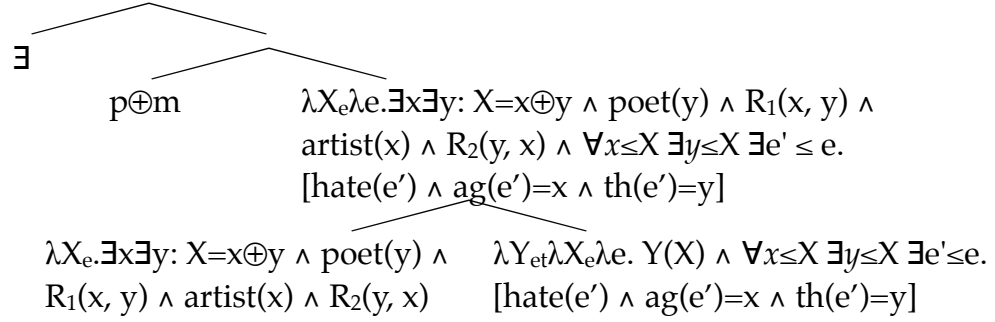
(2.41)

a. Petia i Misha xudozhnik s poetom, kotorye nenavidjat drug druga.

P.NOM and M.NOM artist with poet who hate each other

‘Peter and Mike are an artist and a poet who hate each other’

b. $\exists e \exists x \exists y \exists e_1 \exists e_2. p \oplus m = x \oplus y \wedge \text{poet}(y) \wedge R_1(x, y) \wedge \text{artist}(x) \wedge R_2(y, x) \wedge e = e_1 \oplus e_2 \wedge \text{hate}(e_1) \wedge \text{ag}(e_1) = x \wedge \text{th}(e_1) = y \wedge \text{hate}(e_2) \wedge \text{ag}(e_2) = y \wedge \text{th}(e_2) = x$



In turn, speakers are unsure about the status of the sentence when the relation between the members of the construction is not specified within the predicate; thus (2.40b) is judged as questionable. This further supports my theory: when the *with*-construction is in subject position, the application of ι makes the Relatedness Requirement only a presupposition (2.42a), whereas it is part of the assertion when the *with*-construction is used in the predicative position (2.42b).

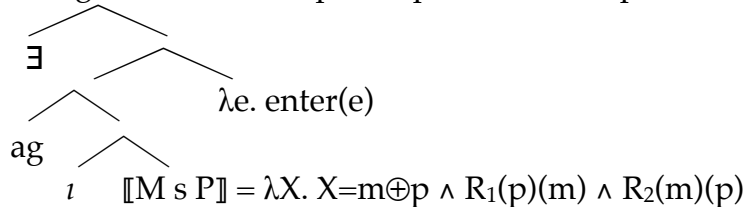
(2.42)

a. Masha s Petej voshli v klass. subject

M._{NOM} with P._{INS} entered._{PL} in classroom

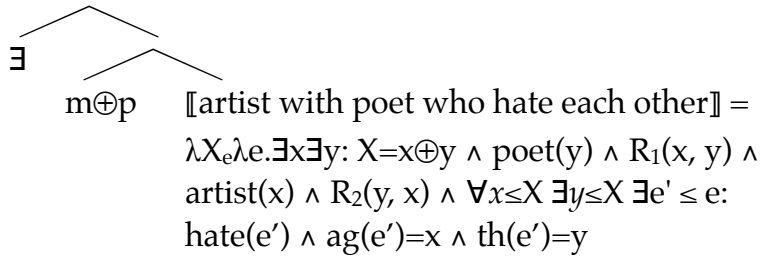
‘Mike and Peter entered the classroom (together)’

$\exists e. \text{enter}(e) \wedge \text{ag}(e) = [\iota X. X = m \oplus p \wedge R_1(p)(m) \wedge R_2(m)(p)]$



b. (2.41a)

predicative



2.7.3 Distributive interpretation of the *with*-construction

The *with*-construction is compatible with all types of predicates. Distributive predicates are always interpreted distributively (2.43). When the predicate has spatiotemporal characteristics, the spatiotemporal strategy to meet the Relatedness Requirement is the most likely one to be used.

(2.43)

a. Petia s Mishej vstali.

temporal proximity

P._{NOM} with M._{INST} stood-up._{PL}

Peter and Mike stood up (together).

b. Petia s Mishej spali.

spatial proximity

P._{NOM} with M._{INST} slept._{PL}

'Peter and Mike were sleeping (together)'

If the predicate has no spatiotemporal characteristics, i.e. it is a state, such as *be American* or *love*, the relational-noun strategy or the contrastive strategy are the most likely to apply. In (2.44), the use of the *with*-construction is felicitous when Peter and Mike are somehow related or when they are the only Americans.

(2.44)

Petia s Mishej iz Ameriki.

P._{NOM} with M._{INST} from America

‘Peter and Mike are from America’

Mixed predicates are primarily interpreted collectively; that is, the collective strategy is the first one to apply. Other strategies that rely on background knowledge can also apply, allowing for the distributive interpretation.

(2.45)

a. Petia s Mishej napisali pismo.

P._{NOM} with M._{INST} wrote.PL letter

‘Peter and Mike wrote a letter’

To summarize, I claim that my analysis predicts a wider range of attested readings than McNally (1993) and offers a more detailed understanding of the Relatedness Requirement than Dalrymple et al. (1998).

2.7.4 Bare noun coordination and the *with*-construction

My analysis of the *with*-construction as a case of reciprocal conjunction not only links the *with*-construction with relational-noun coordination, but also with bare-noun coordination, a phenomenon found in languages that normally require an article or other determiner on singular count nouns, such as English, Spanish or French. Consider the following examples from de Swart & Le Bruyn (2014):

(2.46)

a. Bride and groom look happy. *English*

b. Perro y gato andaban sueltos. *Spanish*

Dog and cat roamed freely

c. Cela fait deux ans que Martine attend une greffe de rein. Son demi-frère Jean-Pierre est prêt à lui faire don d'un rein. Or, un blocage administratif lui refuse ce sacrifice. *Frère*

et soeur ont décidé de se tourner vers le ministre de la Santé pour trancher le conflit. *French*

For two years now, Martine is waiting for a kidney transplant. Her half-brother Jean-Pierre is ready to donate a kidney. However, an administrative rejection renders it impossible for him to make this sacrifice. *Brother and sister* turned to the Minister of Health to resolve the conflict.

De Swart & Le Bruyn (2014) develop the idea of ‘matchmaking semantics’ that essentially treats bare-noun coordination as a case of reciprocal conjunction. Bare-noun coordination and the *with*-construction indeed have a lot in common. Similarly to the *with*-construction, bare-noun coordination only conjoins pragmatically related individuals but is a productive construction and can coordinate virtually any two individuals, given the right contextual frame.

2.8 Another comitative construction: the *together-with* construction

In the following sections I discuss another comitative construction in Russian, the *together-with* construction.

In the previous sections, I discussed the *with*-construction, also known as the Russian comitative construction. Sentences that use the *with*-construction tend to be

interpreted similarly to English sentences with overt *together*. For example, (2.47a) is most likely to be interpreted as *Mike and Peter smiled simultaneously* and (2.47b) as *There exists a raft that Mike and Peter built collectively*.

(2.47)

- | | |
|---|---|
| <p>a. Petia s Mishej ulybnulis.</p> <p>P._{NOM} with M._{INST} smiled.PL</p> <p>‘Mike and Peter smiled together’</p> | <p>b. Petia s Mishej postroili plot.</p> <p>P._{NOM} with M._{INST} built.PL raft</p> <p>‘Mike and Peter built a raft together’</p> |
|---|---|

Further inspection of the Russian data reveals that, in fact, Russian has a construction that is very similar to the *with*-construction and involves overt *together* (*vmeste*). I will call it the *together-with* construction. Since I have not seen it discussed before, all the data below is mine, confirmed with other native speakers of Russian.

At first glance, the *together-with* construction is very similar to the *with*-construction. It is formed by a noun phrase, followed by *vmeste* (‘together’) and a *with*-phrase. The only difference between the *together-with* construction and the *with*-construction is that the prepositional *with*-phrase is preceded by *vmeste* (‘together’), in the case of the *together-with* construction. Similarly to the *with*-construction, the *together-with* construction forms a constituent and triggers plural agreement on the verb (2.48).

(2.48) *together-with* construction: A together with B

Petia vmeste s Mishej postroili plot.

P._{NOM} together with M._{INST} built._{PL} raft

NP1 + together + [with + NP2._{INST}]

The interpretation of the *together-with* construction is very similar to the interpretation of the *with*-construction, but there exist important differences between them. I introduce these differences in the following section.

2.8.1 Interpretation: the *together-with* construction vs. the *with*-construction

The *together-with* construction is often interpreted very similarly to the *with*-construction. In sentences with distributive predicates, the *together-with* construction seems to be interpreted identically to the *with*-construction (2.49a). In the case of mixed predicates (2.49b), the collective interpretation of the *together-with* construction is even more preferred than that of the *with*-construction, and the distributive interpretation is virtually not available. The intersective interpretation is not available either, similarly to the *with*-construction (2.49c).

(2.49)

a. Petia vmeste s Mishej ulybnulis. *distributive*

P._{NOM} together with M._{INST} smiled

‘Peter and Maria smiled’

b. Petia vmeste s Mishej postroili._{PL} plot. *mixed*

P._{NOM} together with M._{INST} built._{PL} raft

Collective: ‘Peter and Maria collectively built a raft’ *available*

Distributive: ‘Peter and Maria each built a raft’ *unavailable*

c. *Etot chelovek — xudozhnik vmeste s poetom. **intersective*

this person artist._{NOM} together with poet._{INST}

The difference between the *with*-construction and the *together-with* construction becomes evident when we look at reciprocals and collective predicates. The most striking difference between the two constructions is that only the *with*-construction is compatible with reciprocals (2.50).

(2.50) *reciprocal*

a. *Petia vmeste s Mishej uvideli drug druga. **together-with*

P._{NOM} together with M._{INST} saw._{PL} each other

b. Petia s Mishej uvideli drug druga. *with*
P.NOM with M.INST saw.PL each other
‘Peter and Mike saw each other’

The case of collective predicates is more complex. The *together-with* construction is compatible only with some of them. For example, it is compatible with *byt gruppoy iz 2 chelovek* ‘be a group of two people’ (2.51a), but not with *vstretitsja* ‘meet’ (2.51b).

(2.51) *collective*

a. Petia vmeste s Mishej eto gruppaz dvux chelovek.
P.NOM together with M.INST this group of two people
‘Mike and Peter are a group of two people’

b. *Petia vmeste s Mishej vstretilis.
P.NOM together with M.INST met.PL

In Chapter IV, I address the compatibility of nominal constructions involving *vmeste* (‘together’) in more detail. I claim that *vmeste* (‘together’) in nominal constructions is sensitive to covert reciprocity of the collective predicate, as suggested by Hackl (2002).

Sentence-internal plural *raznye* ('different') is another lexical item incompatible with the *together-with* construction: compare (2.52a) and (2.52b).

(2.52)

a. *and*-coordination + plural *raznye*

Petia i Misha raznye.

P._{NOM} and M._{NOM} different._{PL}

'Mike and Peter are different'

b. the *together-with* construction + plural *raznye*

*Petia vmeste s Mishej raznye.

P._{NOM} together with M._{INST} different._{PL}

Intended reading: 'Mike and Peter are different'

In English, sentence-internal plural *different* is sometimes seen as having a covert reciprocal component (Beck, 2000; LaTerza, 2014). According to Beck, plural *different* in (2.53a) is a reciprocal use of a relational adjective. Indeed, overt *each other* can sometimes be added to plural *different* without any apparent change in meaning (2.53b).

(2.53)

- a. Mike and Peter are different.
- b. Mike and Peter are different from each other.

In this dissertation, I do not address the incompatibility of the *together-with* construction and sentence-internal plural *raznye* ('different'), but I assume that the covert reciprocity of sentence-internal plural *raznye* ('different') should be able to explain this data.

2.8.2 The *together-with* construction and group terms

A closer look at the *together-with* construction reveals that it patterns together with group terms, such as *komanda* ('team'), but not regular plurals, such as *deti* ('kids'). This claim is supported by the following observations.

First, the *together-with* construction can only be the subject of P-distributivity, but not of Q-distributivity, in contrast to the *with*-construction (see the discussion in 2.5.2). Again, de Vries (2015) shows that group terms and plurals pattern differently for these two types of distributivity, and proposes that these two types of distributivity help differentiate between atomic groups and sums, since groups do not allow for quantification over individual members of the group.

The difference between P-distributivity and Q-distributivity is found in cases when quantifier scope is essential to the meaning of the sentence, predicate disjunction among them. (2.54b) is an example of Q-distributivity, since the disjunction *singing or dancing* holds of each of the individual children. Whereas plurals can have both P-distributive and Q-distributive interpretations, group terms (2.55) and the *together-with* construction (2.56) cannot be the subject of Q-distributivity, but only of P-distributivity.

(2.54)

| | | | | |
|----------|--|-----|----------------------|-------------------------|
| Deti | pojut | ili | tancujut. | <i>plural</i> |
| children | sing. _{PL} | or | dance. _{PL} | |
| a. | 'The kids are singing or the kids are dancing' | | | <i>P-distributivity</i> |
| b. | 'Each kid is singing or dancing' | | | <i>Q-distributivity</i> |

(2.55)

| | | | | |
|---------|--|-----|----------------------|--------------------------|
| Komanda | poet | ili | tancujet. | <i>group</i> |
| team | sing. _{SG} | or | dance. _{SG} | |
| a. | 'The team is singing or the team is dancing' | | | <i>P-distributivity</i> |
| b. | #'Each member of the team is singing or dancing' | | | <i>#Q-distributivity</i> |

(2.56)

Petia vmeste s Mishej pojut ili tancujut *together-with*

P._{NOM} together with M._{INST} sing._{PL} or dance._{PL}

a. 'Mike and Peter are singing or Mike and Peter are dancing.' *P-distributivity*

b. '#Mike is singing or dancing and Peter is singing or dancing.' *#Q-distributivity*

Examples with existential quantifiers also indicate that the *together-with* construction maps with group terms, but not with regular plurals, with respect to the distinction between Q-distributivity and P-distributivity. For example, the sentence with a plural in (2.57) is ambiguous between (2.57a) and (2.57b). The same ambiguity is not observed for group terms (2.58) or the *together-with* construction (2.59).

(2.57)

Deti provodiat v shkoleodin den' v nedeliu. *plural*

kids spend._{PL} in school one day in week

a. 'There is one day a week such that all kids go to school on that day' *P-distributivity*

b. 'For each kid x , there is one day a week y such that x goes to school on y ' *Q-distributivity*

(2.58)

Komanda provodit v shkoleodin den' v nedeliu. *group*

team spend._{SG} in school one day in week

a. 'There is one day a week such that the team goes to school on that day' *P-distributivity*

b. #'For each member of the team x , there is one day a week y such that x goes to school on y '

#Q-distributivity

(2.59)

Petia vmeste s Mishejprovodiat v shkoleodin den' v nedeliu. *together-with*

P._{NOM} together with M._{INST} spend._{PL} in school one day in week

a. 'There is one day a week such that Mike and Peter go to school on that day' *P-distributivity*

b. #'For each kid x , there is one day a week y such that x goes to school on y ' *#Q-distributivity*

Second, Schwarzschild (1996) observes that group terms are incompatible with reciprocal expressions. This turns out to be not a strict requirement in English, and (2.60) lists some counterexamples to this claim, found online. Schwarzschild's claim, however, seems to be true for Russian, in that group terms like *komanda* ('team') (2.61a)

are not compatible with reciprocals, and neither is the *together-with* construction (2.61b), as confirmed by the Russian National Corpus².

(2.60)

a. When the team saw each other in the hallway, they greeted each other.³

b. Small group meets each other and prepares for presentations.⁴

(2.61)

a. *Komanda uvidela drug druga. *group terms*

team saw.SG each other

b. *Misha vmeste s Petej uvideli drug druga. *together-with*

M.NOM together with P.INST saw.PL each other

² [http://search1.ruscorpora.ru/search.xml?](http://search1.ruscorpora.ru/search.xml?env=alpha&mycorp=&mysent=&mysize=&mysentsize=&mydocsize=&spd=&text=lexgramm&mode=main&sort=gr_tagging&lang=ru&nodia=1&parent1=0&level1=0&lex1=%EA%EE%EC%E0%ED%E4%E0&gramm1=&sem1=&sem-mod1=sem&sem-mod1=sem2&flags1=&m1=&parent2=0&level2=0&min2=1&max2=3&lex2=%22%E4%F0%F3%E3%22&gramm2=&sem2=&sem-mod2=sem&sem-mod2=sem2&flags2=&m2=&p=3)

[http://search1.ruscorpora.ru/search.xml?](http://search1.ruscorpora.ru/search.xml?env=alpha&mycorp=&mysent=&mysize=&mysentsize=&mydocsize=&spd=&text=lexgramm&mode=main&sort=gr_tagging&lang=ru&nodia=1&parent1=0&level1=0&lex1=%22%E2%EC%E5%F1%F2%E5+%F1%22&gramm1=&sem1=&sem-mod1=sem&sem-mod1=sem2&flags1=&m1=&parent2=0&level2=0&min2=1&max2=5&lex2=%22%E4%F0%F3%E3%22&gramm2=&sem2=&sem-mod2=sem&sem-mod2=sem2&flags2=&m2=)

[http://search1.ruscorpora.ru/search.xml?](http://search1.ruscorpora.ru/search.xml?env=alpha&mycorp=&mysent=&mysize=&mysentsize=&mydocsize=&spd=&text=lexgramm&mode=main&sort=gr_tagging&lang=ru&nodia=1&parent1=0&level1=0&lex1=%22%E2%EC%E5%F1%F2%E5+%F1%22&gramm1=&sem1=&sem-mod1=sem&sem-mod1=sem2&flags1=&m1=&parent2=0&level2=0&min2=1&max2=5&lex2=%22%E4%F0%F3%E3%22&gramm2=&sem2=&sem-mod2=sem&sem-mod2=sem2&flags2=&m2=)

[http://search1.ruscorpora.ru/search.xml?](http://search1.ruscorpora.ru/search.xml?env=alpha&mycorp=&mysent=&mysize=&mysentsize=&mydocsize=&spd=&text=lexgramm&mode=main&sort=gr_tagging&lang=ru&nodia=1&parent1=0&level1=0&lex1=%22%E2%EC%E5%F1%F2%E5+%F1%22&gramm1=&sem1=&sem-mod1=sem&sem-mod1=sem2&flags1=&m1=&parent2=0&level2=0&min2=1&max2=5&lex2=%22%E4%F0%F3%E3%22&gramm2=&sem2=&sem-mod2=sem&sem-mod2=sem2&flags2=&m2=)

³ <http://highschoolsports.mlive.com/news/article/6431161045463784474/father-and-son-former-grand-blanc-runner-darius-mcclinton-hunters-journey-from-arkansas-to-all-state-shaped-by-relationship-with-his-dad-los-angeles-angels-outfielder-torii-hunter/>

⁴ <http://www.isanet.org/Conferences/Special-Convention-Programs/JSS/Format>

These facts suggest that the *together-with* construction should be analyzed differently from the *with*-construction, but similar to group terms. I adopt the analysis of group terms as impure atoms (Landman, 1989). I claim that the *together-with* construction denotes an impure atom and is, in a way, the comitative construction McNally (1993) talks about — that is, the analysis she develops is applicable to the *together-with* construction, but not to the *with*-construction.

2.9 Analysis of the *together-with* construction

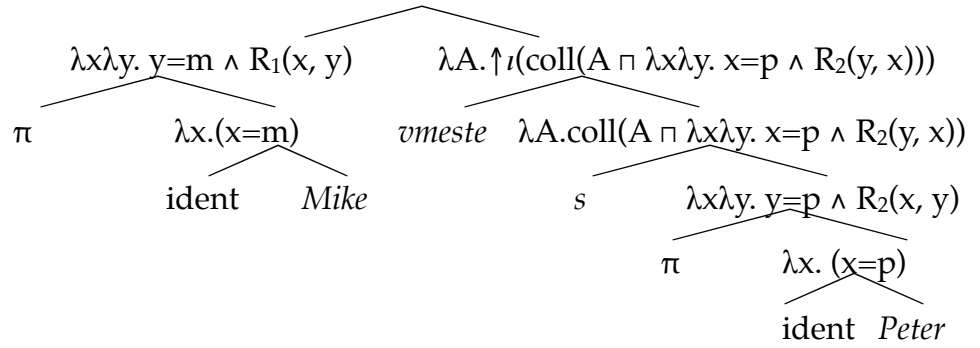
I propose the following denotation for *vmeste* in the *together-with* construction (2.62): essentially, it combines two individuals and forms an impure atom using \uparrow . The meaning of *s* ‘with’ in the *together-with* construction is assumed to be the same as the meaning of *s* ‘with’ in the *with*-construction, repeated here in (2.62b). The meaning of *Mike together with Peter* is derived in (2.62c).

(2.62)

a. $\llbracket \text{vmeste}_{\text{COMITATIVE}} \rrbracket = \lambda x_{\langle \langle e, \text{et} \rangle, \text{et} \rangle} \lambda y_{\langle e, \text{et} \rangle} \cdot \uparrow ix(y)$

b. $\llbracket s \rrbracket = \lambda x_{\langle e, \text{et} \rangle} \lambda y_{\langle e, \text{et} \rangle} \cdot \text{coll}(y \sqcap \text{inv}(x))$

c. $\llbracket \text{Misha vmeste s Petej} \rrbracket = \uparrow \iota(\text{coll}(\lambda x \lambda y. y=m \wedge R_1(x, y) \wedge x=p \wedge R_2(y, x))) = \uparrow(m \oplus p)$



The distributive interpretation of the *together-with* construction (2.63a) should be seen as an example of P-distributivity. That is, it should receive the same explanation as the distributive interpretation of group nouns (2.63b). Traditionally, this distributive effect is explained as a consequence of lexical properties of the verb, that is, by meaning postulates (Scha, 1981). Employing a meaning postulate as in (2.63c) explains the distributive interpretation of (2.63a) and (2.63b). Mixed predicates like *build a raft* can only be interpreted as a case of Q-distributivity, as containing an indefinite.

(2.63) *distributive*

a. Misha vmeste s Petej ulybnulis. *together-with*

M._{NOM} together with P._{INST} smiled

‘Mike and Peter smiled together’

b. Komanda ulybnulas.

group

team.NOM smiled

‘The team smiled’

c. **Meaning postulate:** $\text{smile}(\uparrow X) \Rightarrow \forall x \leq X[\text{atom}(x) \rightarrow \text{smile}(x)]$

In contrast to the *with*-construction, the *together-with* construction denotes an impure atom. This explains why it is not compatible with reciprocal predicates (2.64a), which I assume are not defined for atomic individuals; see Chapter III for more discussion. This also this explains why the *together-with* construction is only interpreted collectively in the case of mixed predicates, as in (2.64b).

(2.64)

a. *Petia vmeste s Mishej uvideli drug druga.

reciprocal

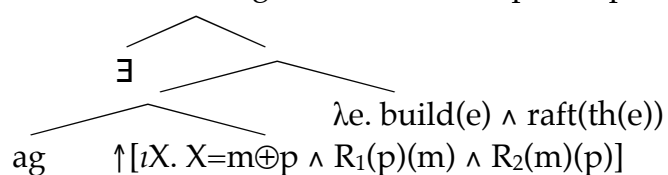
P.NOM together with M.INST saw.PL each other

b. Petia vmeste s Mishej postroili plot.

mixed

P.NOM together with M.INST built raft

$\exists e. \text{build}(e) \wedge \text{raft}(\text{th}(e)) \wedge \text{ag}(e) = \uparrow[\iota X. X = m \oplus p \wedge R_1(p)(m) \wedge R_2(m)(p)]$



Finally, the Relatedness Requirement is contributed by comitative *s* ‘with’ and holds for the *together-with* construction. While it is hard to track in cases when the *together-with* construction is interpreted collectively, for sentences with distributive predicates speakers report that the *together-with* construction is best used when the members of the construction are “somehow” related, similarly to the *with*-construction.

2.10 Chapter summary

In this chapter I have discussed two comitative constructions found in the Russian language: the *with*-construction and the *together-with* construction. While the *with*-construction has been discussed before, the *together-with* construction is new to the scholarly discussion.

Previous work on the *with*-construction has focused on the debate of whether this construction should be analyzed as a sum (Dalrymple et al., 1998a) or as a group, in Landman’s sense (McNally, 1993). I have proposed an account of the *with*-construction that is, essentially, along the lines of Dalrymple’s idea. I have also claimed that it is the *together-with* construction that should be analyzed as a group.

I have proposed that the *with*-construction is a case of reciprocal conjunction and should be analyzed similar to the cases of relational-noun coordination, i.e. *muzh i zhená* (‘husband and wife’). I have used Staroverov’s (2007) theory of reciprocal conjunction in

combination with Barker's (2011) theory of possessives (2011) and in Section 2.6 proposed the following meaning for the *with*-construction (2.65).

(2.65)

$$a. \llbracket s \rrbracket = \lambda x_{\langle e, et \rangle} \lambda y_{\langle e, et \rangle} . \text{coll}(y \sqcap \text{inv}(x))$$

$$b. \llbracket \text{muzh s zhenoj} \rrbracket = \lambda X \exists x \exists y. X = x \oplus y \wedge \text{husband}(x, y) \wedge \text{wife}(y, x) \quad \text{relational noun}$$

$$c. \llbracket \text{Misha s Petej} \rrbracket = \lambda X. X = m \oplus p \wedge R_1(p, m) \wedge R_2(m, p) \quad \text{proper noun}$$

$$d. \llbracket \text{xudozhnik s poetom} \rrbracket = \lambda X \exists x \exists y. X = x \oplus y \wedge \text{poet}(y) \wedge R_1(x, y) \wedge \text{artist}(x) \wedge R_2(y, x)$$

common non-relational noun

As can be seen above, I have claimed that the *with*-construction is a set of sums where the members of the sum are related via R_1 and R_2 that are either supplied by the context, in the case of proper names and non-relational nouns, or are the part of the noun meaning, in the case of relational nouns.

I have taken Dalrymple et al.'s side in the sum-group debate, by claiming that the *with*-construction is, essentially, a sum. My account, however, has explains the "relatedness" intuition speakers have: they report that the *with*-construction is best used when the members of the construction are "somehow related". While Dalrymple et al. claim that the difference between ordinary *and*-coordination and the *with*-construction is only pragmatic, I have proposed that the *with*-construction is derived via a more

complex mechanism of reciprocal conjunction. Such an approach explains the presence of the Relatedness Requirement.

Dalrymple et al. (1998a) explain the prominence of the collective interpretation of the construction by saying that the sum denotation of the *with*-construction is a more salient referent than the individual denotations of the members of the construction, which blocks the application of distributive operators and has the effect that the collective interpretation is the only one available. It is not clear, however, how this salience can be implemented formally. In turn, I have proposed that the prominence of the collective interpretation of the *with*-construction is the result of the collective strategy for the Relatedness Requirement. This strategy, however, does not need to apply, as other strategies, spatiotemporal, relational or contrastive can apply instead, allowing for the sentence to be interpreted distributively.

I have introduced the *together-with* construction to the scholarly discussion. Similar to the *with*-construction, the *together-with* construction forms a constituent, tends to be interpreted collectively, yet allows for a distributive interpretation. In contrast to the *with*-construction, the *together-with* construction is incompatible with reciprocal predicates and with certain collective predicates.

This incompatibility indicates that the *together-with* construction should be analyzed similar to group terms, i.e. *komanda* ('team'), which are also incompatible with reciprocal predicates and certain collective predicates in Russian. I have shown that the *together-*

with construction can only be the subject of the so-called P-distributivity, but not Q-distributivity, similarly to group terms. I have concluded that the *together-with* construction should be analyzed as identical to group terms and propose that it denotes an impure atom. I have proposed that comitative *vmeste* ('together') in the *together-with* construction is a group forming operator. In a way, I have claimed that McNally's (1993) proposal was, in fact, accurate for the *together-with* construction, but not for the *with*-construction. I explained the incompatibility of the *together-with* construction with reciprocal predicates by assuming that reciprocal predicates cannot have atomic arguments in their denotation. The next chapter develops this idea.

CHAPTER III. ADNOMINAL *VMESTE* ‘TOGETHER’

3.1 What this chapter is about

In this chapter I look at Russian *vmeste* (‘together’) in the adnominal modifier position. Unlike the *together-with* construction, adnominal *vmeste* behaves very similarly to English *together* in that position. I discuss the previously unnoticed incompatibility of adnominal *vmeste* with reciprocal predicates, as well as its inability to give rise to readings involving group credit and incompatibility with reciprocal predicates.

I review current theories of *together*, the event-mereology based approaches by Lasersohn (1990, 1998), and alternative approaches by Schwarzschild (1992) and Moltmann (2004), as well as two recent theories of *each other*: a non-compositional theory by Dotlačil (2010) and a compositional theory by LaTerza (2014). I show that current theories of *together* cannot explain the incompatibility of adnominal *vmeste* and reciprocal *drug druga* and propose my own theory of adnominal *together/vmeste*.

My proposal uses events, similarly to Lasersohn. I propose that adnominal *vmeste* has a more limited range of interpretations than Lasersohn’s *together*; therefore my

proposal does not overgenerate, unlike Lasnik (1990). I propose that the idea that *vmeste* ('together') is an 'anti-distributivity' marker pursued by Lasnik (1990, 1998) and Schwarzschild (1992) is, in fact, correct, at least for *vmeste* ('together') in the adnominal position, the major problem being the right way to formulate it. My proposal explains three major data points : the inability of *vmeste* ('together') to have a group credit reading and its incompatibility with distributive and reciprocal predicates. In a way, it is very simple: my adnominal *vmeste* ('together') explicitly blocks group credit readings and the rest is achieved as a consequence of that.

The chapter is organized as follows. Section 3.2 introduces Russian data involving the use of *vmeste* ('together') within a nominal phrase other than the *together-with* construction discussed in the previous chapter. Section 3.3 reviews current theories of *together*. In Section 3.4, I review two recent theories of reciprocals. Each of them, in combination with current theories of *together*, makes wrong predictions about the incompatibility of reciprocals and adnominal *vmeste* ('together'). In Section 3.5, I introduce my own event-based theory of adnominal *vmeste* ('together') and show its advantages, compared to previous theories of *together*.

3.2 Introduction of other uses of *vmeste* ('together')

The discussion of the *together-with* construction in the previous chapter suggests looking at the other uses of *vmeste* ('together'). Indeed, apart from the *together-with* construction, the distribution and interpretation of Russian *vmeste* is very similar to those of English *together*. Russian *vmeste* can appear both in adverbial and in adnominal positions and can specify collectivity or spatiotemporal proximity (3.1). In this chapter, I only discuss the adnominal use of Russian *vmeste*.

(3.1) a. Adnominal *vmeste*:

| | | | | |
|---------------------------------|----------|----------|--------|-------------------|
| Malchiki | vmeste | ispekli | pirog. | <i>collective</i> |
| boys | together | baked.PL | pie | |
| 'The boys together baked a pie' | | | | |

b. Adverbial *vmeste*:

| | | |
|--------------------------|-----------------|-----------------------|
| Malchiki | prishli vmeste. | <i>spatiotemporal</i> |
| boys | came together | |
| 'The boys came together' | | |

Adnominal *vmeste* ('together') is only compatible with mixed predicates (3.2a), but not with distributive predicates or reciprocals (3.2b). That is, adnominal *vmeste* is very

similar to the *together-with* construction, the only difference being that the *together-with* construction is perfectly compatible with distributive predicates, whereas adnominal *together* is not. Adnominal *vmeste* triggers a collective interpretation of the predicate, similarly to the *together-with* construction.⁵

(3.2)

- a. Malchiki vmeste postroili plot. *mixed*
 boys together built.PL raft
 'The boys together built a raft' *collective / #spatiotemporal*
- b. Malchiki vmeste *ulybnulis / *uvideli drug druga **distributive / *reciprocal*
 boys together *smiled.PL / *saw.PL each other

Another peculiar contribution of adnominal *vmeste* is that it rules out interpretations involving group credit. Consider a scenario of a potluck party, to which everyone is expected to bring some dish. (3.3a) is true in a situation in which Peter and Maria are a

⁵ One might suspect that the instance of *vmeste* ('together') in (3.2a) is adverbial. If so, this would raise the possibility that adnominal *vmeste* ('together') is ruled out in such sentences for independent reasons. To remove adverbial *vmeste* ('together') as a confounding factor and show the contrast between (3.2a) and (3.2b) we can consider various constituency tests. Fragment answers are among the constituency tests that confirm the data in (3.2):

- (i) Kto postroil plot? Malchiki vmeste *mixed*
 who built.SG raft? boys together
- (ii) Kto ulybnulsja / uvidel drug druga? *Malchiki vmeste
 who smiled.SG / saw.SG each other ? *boys together **distributive / *reciprocal*

couple who bring a pie, but it is only Maria who bakes it. Adnominal *vmeste* in (3.3b) requires that both Peter and Maria participate in baking.

(3.3) *At a potluck party:*

a. Petia i Masha ispekli pirog.

P._{NOM} and M._{NOM} baked._{PL} pie

‘Peter and Maria baked a pie’

OK if it is only Maria who bakes the pie

b. Petia i Masha vmeste ispekli pirog.

P._{NOM} and M._{NOM} together baked._{PL} pie

‘Peter and Maria together baked a pie’

Both Peter and Maria have to contribute

The incompatibility of distributive predicates and adnominal *together* is discussed by Schwarzschild (1992) and Moltmann (2004), whereas the interaction of reciprocal predicates and adnominal *together* has not been noticed before. As to group credit, Lasersohn (1990) does make correct predictions about it (in fact, Lasersohn explicitly discusses it), but Lasersohn (1998) does not. In the following sections, I show that neither of these approaches can account for all of the Russian data outlined in this

section and propose my own theory of adnominal *vmeste*. In my theory, adnominal *vmeste* blocks group credit readings by requiring every member of the construction to contribute to the event and the incompatibility of adnominal *vmeste* and reciprocal predicates is achieved as a consequence of that.

The table below summarizes the data presented in this section.

(3.4)

| | <i>with-</i> construction | <i>together-with</i> construction | adnominal <i>vmeste</i> | <i>and</i> -coordination |
|-------------------------------|------------------------------|--------------------------------------|----------------------------|--------------------------|
| distributive: | | | | |
| <i>smile</i> | ✓ | ✓ | ✗ | ✓ |
| mixed: | ✓ collective | ✓ collective | ✓ collective | ✓ collective |
| <i>build a raft</i> | ✓ distributive | only | only | ✓ distributive |
| collective: | | | | |
| <i>meet</i> | ✓ | ✗ | ✗ | ✓ |
| <i>be a group of 2 people</i> | ✓ | ✓ | ✓ | ✓ |
| reciprocal: | | | | |
| <i>see each other</i> | ✓ | ✗ | ✗ | ✓ |

Table 1: Summary of the data this dissertation accounts for

3.3 Theories of *together*

In this section, I examine the state-of-the-art theories of *together* by Lasersohn (1990, 1998), Schwarzschild (1992), and Moltmann (2004) in order to show that they cannot explain the data outlined in Section 3.2.

3.3.1 Lasersohn (1990, 1998), and Schwarzschild (1992)

In his influential work, Lasersohn (1990) aims to express the meaning of *together* within the framework of event mereology. His goal is to capture the ability of *together* to have a collectivizing reading, as well as the readings indicating the spatiotemporal proximity of the events in question. His denotation for *together* is in (3.5a).

(3.5) Lasersohn (1990):

$$a. \llbracket \text{together} \rrbracket = \lambda P_{\langle v, et \rangle} \lambda e_v \lambda g_e [\exists e' \leq e [g \in P(e') \wedge \forall e'' \leq e' [\exists x \in P(e'') \rightarrow f(e'') = f(e')]]]$$

b. Collectivizing *together*:

$$\llbracket \text{together}_{\text{coll}} \rrbracket =$$

$$\lambda P_{\langle v, et \rangle} \lambda e_v \lambda g_e [\exists e' \leq e [g \in P(e') \wedge \forall e'' \leq e' [\exists x \in P(e'') \rightarrow P(e'') = P(e')]]] \quad f = P$$

c. Spatial proximity:

$$\llbracket \text{together}_{\text{loc}} \rrbracket =$$

$$\lambda P_{\langle v, et \rangle} \lambda e_v \lambda g_e [\exists e' \leq e [g \in P(e') \wedge \forall e'' \leq e' [\exists x \in P(e'') \rightarrow \sigma(e'') = \sigma(e')]]] \quad f = \sigma$$

d. Temporal proximity:

$$\llbracket \text{together}_{\text{temp}} \rrbracket =$$

$$\lambda P_{\langle v, et \rangle} \lambda e_v \lambda g_e [\exists e' \leq e [g \in P(e') \wedge \forall e'' \leq e' [\exists x \in P(e'') \rightarrow \tau(e'') = \tau(e')]]] \quad f = \tau$$

The framework Lasersohn uses is slightly different from the one I am using in this dissertation. For him, events are not exact verifiers: if e_1 is P -ing event, then every $e_2 \geq e_1$ is also a P -ing event. In (3.5a), e' is the minimal event that can be described by the predicate P , and since $e' \leq e$, e can also be described by P . Furthermore, predicates are functions from events to the set of agents participating in these events. Finally, (3.4a) has a free variable f which can be P or a trace function of location σ or time τ (a function that maps events to intervals representing their temporal and spatial locations). Substituting P for f results in the collectivizing *together* (3.5b): e' cannot have P -ing subevents whose agent is different from the agent of e' . In the same vein, substituting σ or τ for f results in the spatiotemporal-proximity reading of *together* (3.5c, d).

Lasersohn (1990) is criticized by Schwarzschild (1992). Schwarzschild notes that Lasersohn's theory makes wrong predictions about examples that involve monotone decreasing (3.6a) or non-monotone (3.6b) quantifiers, or "downward entailing" contexts of some other type (3.6c). For example, in (3.6a), if *John and Mary together lifted fewer than three pianos* is true, then it is guaranteed that *John lifts fewer than three pianos* is true and *Mary lifts fewer than three pianos* is true (it is possible that John lifts one piano and Mary lifts one piano). Then, (3.6a) is predicted to always be false, according to (3.4b), which requires *John lifted fewer than three pianos* to be false, contrary to speakers' intuitions. In a similar fashion, (3.6b) is predicted to be false in a scenario in which John and Mary lift two pianos each (that is, *between two and four pianos each*), contrary to speakers' intuition.

(3.6)

- a. John and Mary together lifted fewer than three pianos.
- b. John and Mary together lifted between two and four pianos.
- c. These two boxes together are light enough to carry.

Schwarzschild proposes his own theory based on the idea of positive and negative denotations, as also employed by Cooper (1983) and others. His theory aims to explain the cases in which the collective interpretation of a sentence entails the distributive interpretation of the sentence, as in (3.6), since cases like this are blocked by Lasnik (1990).

Schwarzschild defines positive and negative denotations of a predicate P as in (3.7). The positive denotation $\llbracket P \rrbracket_+$ of a predicate P is a function mapping onto 1 all those individuals in its domain that have the property represented by P . Anything else in the domain is mapped onto 0. The negative denotation $\llbracket P \rrbracket_-$ is the function that maps an individual onto 1 if $\llbracket P \rrbracket_+$ maps it onto 0, and vice versa. If $\sim P$ is the negation of P , $\llbracket \sim P \rrbracket_+ = \llbracket P \rrbracket_-$.

(3.7)

a. $\llbracket P \rrbracket_+ = \lambda x. P(x)$

b. $\llbracket P \rrbracket_- = 1 - \llbracket P \rrbracket_+$

c. $\llbracket P(t) \rrbracket_+ = 1$ iff $^*\llbracket P \rrbracket_+(t) = 1$

d. $\llbracket P(t) \rrbracket_- = 1$ iff $^*\llbracket P \rrbracket_-(t) = 1$

Schwarzschild extends the system of positive (3.7c) and negative (3.7d) denotations to formulas. The positive denotation of a formula is 1 iff the denotation of the subject is in the closure under sum formation of the positive denotation of the predicate, and the negative denotation of the formula is 1 iff the denotation of the subject is in the closure of the negative denotation of the predicate.

Importantly, in this system, for a given individual g and predicate P , $P(g)$ and $\sim P(g)$ can be simultaneously true (that is, $\llbracket P(g) \rrbracket_+ = 1$ and $\llbracket \sim P(g) \rrbracket_+ = 1$). Suppose that John and Mary lift the piano collectively but not distributively, and let $j \oplus m$ denote the group of John and Mary and P translate as *lift the piano*. In this case, $\llbracket P \rrbracket_+(j \oplus m) = 1$, hence $\llbracket P(j \oplus m) \rrbracket_+ = 1$. Since neither John nor Mary lift the piano, it holds that $\llbracket P \rrbracket_-(j) = 1$ and $\llbracket P \rrbracket_-(m) = 1$, hence $\llbracket \sim P \rrbracket_+(j) = 1$ and $\llbracket \sim P \rrbracket_+(m) = 1$, hence $\llbracket \sim P(j \oplus m) \rrbracket_+ = 1$. However, if both the collective interpretation and the distributive interpretation of the sentence are true, then $\llbracket P \rrbracket_+(j) = 1$ and $\llbracket P \rrbracket_+(m) = 1$, hence $\llbracket P \rrbracket_-(j) = 0$ and $\llbracket P \rrbracket_-(m) = 0$, hence $\llbracket \sim P(j \oplus m) \rrbracket_+ = 0$.

Schwarzschild defines the operator EACH (3.8a) and his definition for *together* is in (3.8b). (3.8b) does not rule out examples as in (3.6), see the example derivation of (3.6a) *John and Mary together lifted fewer than three pianos* in (3.9).

(3.8)

$$\text{a. EACH} = \lambda P \lambda x \forall y \leq x [P(y)]$$

$$\text{b. } \llbracket \text{together} \rrbracket = \lambda x \lambda P [P(x) \wedge [\sim P(x) \rightarrow \text{EACH}(\sim P)(x)]]$$

(3.9)

$$\llbracket \text{John and Mary together lifted fewer than three pianos} \rrbracket =$$

$$\llbracket \text{together} \rrbracket(j \oplus m)(\text{lift-less-3}) =$$

$$\text{lift-less-3}(j \oplus m) \wedge [\sim \text{lift-less-3}(j \oplus m) \rightarrow \text{EACH}(\sim \text{lift-less-3})(j \oplus m)] =$$

$$\text{lift-less-3}(j \oplus m) \wedge [\sim \text{lift-less-3}(j \oplus m) \rightarrow \text{EACH}(\sim \text{lift-less-3})(j \oplus m)] =$$

$$[\text{lift-less-3}(j \oplus m) \wedge [\sim \text{lift-less-3}(j \oplus m) \rightarrow \forall y \leq j \oplus m [\text{lift-less-3}(y)]]] =$$

$$\text{lift-less-3}(j \oplus m) \wedge [\sim \text{lift-less-3}(j \oplus m) \rightarrow \text{lift-less-3}(j) \wedge \text{lift-less-3}(m)]$$

TRUE if *John lifted fewer than 3 pianos and Mary lifted fewer than 3 pianos*

Lasersohn (1998) claims that the data in (3.6) that motivates Schwarzschild's analysis can be explained within the framework of event mereology and proposes the following new definition for *together* (3.10). The difference between (3.10) and Lasersohn's (1990)

(3.5) is only slight. The definition in (3.19) exposes weaker restrictions on the events in the denotation of the sentence and requires that e' does not have subevents whose agents do not overlap. Lasersohn claims that (3.10) explains the data in (3.6).

(3.10)

[[together]] =

$$\lambda g_e \lambda P_{\langle v, et \rangle} \lambda e_v [\exists e' \leq e [g \in P(e') \wedge \forall e'' \forall e''' \leq e' [[\exists x \in P(e'') \wedge \exists y \in P(e''')] \rightarrow f(e'') \circ f(e''')]]]$$

In the next section, I show that this improvement introduced in Lasersohn (1998) causes (3.10) to make wrong predictions about scenarios that involve group credit.

3.3.2 Lasersohn (1990) and (1998), and group credit

Consider the example in (3.3b), repeated here in (3.11). Adnominal *vmeste* ‘together’ does not allow for readings involving group credit and requires that both Peter and Maria participate in baking.

(3.11) *At a potluck party, Peter and Maria are a couple:*

Petia i Masha vmeste ispekli pirog.

P_{NOM} and M_{NOM} together baked pie

‘Peter and Maria together baked a pie’

Both Peter and Maria are required to contribute, FALSE if it is Maria who baked a pie.

(3.12) Lasersohn (1998)

(3.11) = $\lambda e[\exists e' \leq e [\{m, p\} \in P(e') \wedge \forall e'' \forall e''' \leq e' [[\exists x \in P(e'') \wedge \exists y \in P(e''')] \rightarrow P(e'') \circ P(e''')]]]$

According to Lasersohn (1998), (3.11) is true of events e such that there exists a subevent e' such that Peter and Maria baked a pie in e' , and for any two subevents e'' and e''' of e' in which somebody bakes a pie, the set of individuals who bake a pie in e'' overlaps with the set of individuals who bake a pie in e''' . In a group credit scenario where it is Maria who physically bakes a pie in e' , $\{m\} \in P(e')$ should be true as well. If e'' is the event in which Maria physically bakes a pie then $e'' \leq e'$. Now, if you take $e''' = e'$, then $\{m\} \in P(e'') \circ P(e''')$. That is, applying Lasersohn (1998) onto Russian adnominal *vmeste* predicts that (3.10) is true ingroup credit scenario, contrary to speakers' intuition.

Lasersohn (1990) correctly predicts that (3.11) is false. According to Lasersohn (1990), (3.11) is true of events e such that there exists a subevent e' such that Peter and Maria baked a pie in e' , and for any subevent e'' of e' in which somebody bakes a pie, the set of

individuals who bake a pie in e'' is equal to the set of individuals who bake a pie in e' (3.13). In a scenario where it is Maria who physically bakes a pie, as the one described above, there should be an event $e'' \leq e'$ in which it is Maria who bakes a pie, but not Peter and Maria. That is, $P(e'') \neq P(e')$, which indicates that (3.11) is false.

(3.13) Lasersohn (1990)

$$\llbracket 3.11 \rrbracket = \lambda e [\exists e' \leq e [\{m, p\} \in P(e') \wedge \forall e'' \leq e' [\exists x. x \in P(e'') \rightarrow P(e'') = P(e')]]$$

Since Lasersohn (1990) makes correct predictions in scenarios involving group credit, unlike Lasersohn (1998), I will work with Lasersohn (1990) in the discussion of the interaction of reciprocals and adnominal *together*. Lasersohn (1990) does not explain the problematic data involving quantifiers *less than three* or *between two and four*, but in Section 3.5.2 I discuss possible ways to approach this problem.

3.3.3 Moltmann (2004)

Moltmann (2004) offers additional criticism of Lasersohn (1990) and Lasersohn (1998). Moltmann focuses mostly on adnominal *together* and notes a range of problems not covered by either of Lasersohn's approaches. First, adnominal *together* lacks the

spatiotemporal proximity reading (3.14a). Second, it is not compatible with distributive predicates, such as *smile* (3.14b).

(3.14)

- a. The boys together received \$100. *#spatiotemporal proximity*
- b. #The boys together smiled. **distributive*

Moltmann abandons the event framework used by Lasersohn and proposes a measurement-based analysis of adnominal *together* (3.15). She claims that adnominal *together* requires that a cumulative measurement f is induced on the group g denoted by the *together*-NP. For example, (3.14a) translates as (3.16), where the induced cumulative measurement of a group is the amount of dollars the group received.

(3.15)

For an additive measure function f from the structure (D, \wedge) for a set of entities D to the structure $(R, +)$; for a set of real numbers R ; for a property S of real numbers; for any $d \in D$; $\langle d, f, S \rangle \in \text{TOGETHER}$ iff $f(d) \in S$

(3.16) receive \$100(boys) & together (boys, $\lambda x.\text{receive}(x)$, 100)

Moltmann's account correctly predicts that the spatiotemporal proximity reading does not pertain to adnominal *together*. She claims that distributive predicates do not provide any measure function to satisfy the requirement in (3.15) and therefore are ruled out.

One of the problems with Moltmann's account is that adnominal *together* does allow for event-related readings. She suggests that, for telic predicates, as in (3.17), there is a measurement correlate consisting of the event and a function mapping individuals to a sum event constituting that event, but does not provide a formal discussion of this correlate.

(3.17)

- a. John and Mary together have lifted the piano.
- b. John and Mary together have solved the problem.

Importantly, Moltmann focuses on adnominal *together* and shows that adnominal *together* and adverbial *together* have a different range of readings.

3.4 Reciprocals and *together*

Theories of reciprocals have two major goals. The first goal is to explain the vast range of readings that the sentences with reciprocals may have. Dalrymple et al. (1998b) and

Beck (2001) identify a list of readings used by many subsequent theories of reciprocals. The second goal is to establish whether reciprocals should be analyzed compositionally or not. A compositional analysis of *each other* derives its meaning from the meanings of *each* and *other*. A non-compositional analysis treats *each other* as a single lexical item. I will review two recent theories of reciprocals, Dotlačil (2010) and LaTerza (2014), and show that neither of them predicts the incompatibility of adnominal *together* and reciprocals.

3.4.1 Different readings of reciprocals

Dalrymple et al. (1998b) and Beck (2001) identify the following range of meanings of reciprocals. A sentence with *each other* can get more than one interpretation, which largely depends on the lexical meaning of the verb as well as the context. Researchers tend to agree that the schemes listed in (3.18) encompass all possible interpretations of sentences involving *each other*.

In (3.18), R is a binary relation denoted by the verb, and A is a set denoted by the plural antecedent of *each other*.

(3.18)

a. Strong Reciprocity (SR): $\forall x \forall y \in A [x \neq y \rightarrow xRy]$

Legislators must refer to each other indirectly.

'Every legislator must refer to every other legislator indirectly'

b. Intermediate Reciprocity (IR):

$\forall x, y \in A [x \neq y \rightarrow \exists z_0 \dots z_n \in A [x = z_0 \wedge y = z_n \wedge z_0 R z_1 \wedge \dots \wedge z_{n-1} R z_n]]$

Five Boston pitchers sat alongside each other.

c. Weak Reciprocity (WR):

$\forall x \in A \exists y \exists z \in A [x \neq y \wedge x \neq z \wedge xRy \wedge zRx]$

The children gave each other a present.

'Every child gave and received a present.'

d. One-way Weak Reciprocity (OWR):

$\forall x \in A \exists y \in A [x \neq y \wedge xRy]$

The pirates were staring at each other in surprise.

'Every pirate was staring at some other pirate in surprise.'

e. Inclusive Alternative Ordering (IAO):

$$\forall x \in A \exists y \in A [x \neq y \wedge (xRy \vee yRx)]$$

The planks are stacked atop each other

'Every plank is stacked atop or under some other plank.'

f. Partitioned Strong Reciprocity (PSR):

$$\exists \text{ partition PART of } A \text{ such that } \forall x \in \text{PART} [\forall y \in X [x \neq y \rightarrow xRy]]$$

3.4.2 Dotlačil (2010)

Dotlačil (2010) pursues a non-compositional approach to reciprocals, claiming that a compositional approach works better for items like *one another*, than for *each other*. His interpretation of a simple reciprocal sentence in (3.19a) is in (3.19b): there is a possibly plural event of seeing, in which the boys are both agent and theme, and that event can be split into subevents which have a distinct agent and theme. A simplified denotation for reciprocal *each other* is in (3.20).

(3.19)

a. The boys saw each other.

b. $\exists e. \langle \oplus \text{boy}, \oplus \text{boy}, e \rangle \in *(\lambda a \lambda b \lambda e'. \text{see}(e') \wedge \text{ag}(e')=a \wedge \text{th}(e')=b \wedge e' \leq e \wedge \neg a \circ b))$

(3.20)

$$\llbracket \text{each other}_{\text{DOTLACIL}} \rrbracket = \lambda P \lambda x \lambda e. *(\lambda a \lambda b \lambda e'. P(e') \wedge \text{ag}(e')=a \wedge \text{th}(e')=b \wedge e' \leq e \wedge \neg a \circ b)(x, x, e)$$

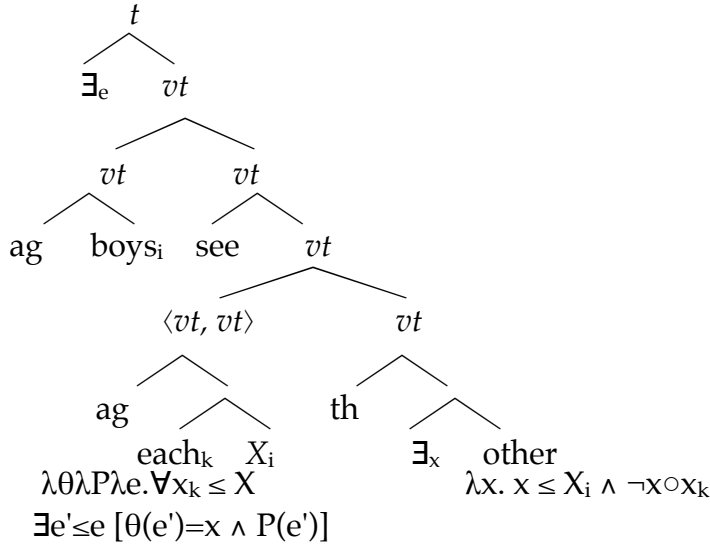
Dotlačil suggests that the primary reading of *each other* is the weak reciprocal reading (3.18c), and other readings are possible via certain pragmatic mechanisms.

3.4.3 LaTerza (2014)

LaTerza (2014) explores various approaches to distributivity within the framework of event semantics and provides a unified analysis of different uses of *each*. He takes a compositional approach to the analysis of reciprocal *each other* based on his analysis of *each*. The schematic representation of reciprocals and the derivation scheme under this approach are shown in (3.21). The meaning of *see each other* is in (3.22).

(3.21)

[s...Antecedenti ... [DP ...each one of them_i ...]_k ... [DP ...other of them_i than that_k ...]...]



(3.22)

[[see each other]] = $\lambda X \lambda e. \forall x \leq X \exists y \leq X \exists e' \leq e [\text{see}(e') \wedge \text{ag}(e')=x \wedge \text{th}(e')=y]$

Similar to Dotlačil, LaTerza suggests that the primary reading of *each other* is one-way weak reciprocity (3.18d), and that other readings are due to pragmatics.

3.4.4 Can *together* and *each other* work together with *each other*?

In this section, I show that different theories of adnominal *together* cannot predict the incompatibility adnominal *vmeste* with reciprocal predicates. I start with Lasersohn (1990). Since adnominal *together* does not have the spatiotemporal proximity reading, I only consider the collectivizing *together* (3.23a). Then, (3.23b) translates (3.23a) to the

framework used in this dissertation: *together* takes an individual g and a predicate P and returns a set of events e such that e is in P , g is agent of e , and for any subevent e' of e if e' is in P , then g is agent of e' . That is, *together* expresses a restriction on e to the effect that e has no subevents e' that are P -ing events and whose agent is a proper part of the agent of e . The denotation for the *together*-NP *John, Kim and Mary together* is in (3.23c).

(3.23)


- a. $\llbracket \text{together}_{\text{coll}} \rrbracket = \lambda g \lambda P \lambda e [\exists e' \leq e [g \in P(e') \wedge \forall e'' \leq e' [\exists x \in P(e'') \rightarrow P(e'') = P(e')]]]$
- b. $\llbracket \text{together}_{\text{coll}} \rrbracket = \lambda g \lambda P \lambda e [P(e) \wedge \text{ag}(e)=g \wedge \forall e' \leq e [P(e') \rightarrow \text{ag}(e')=g]]$
- c. $\llbracket \text{John, Kim and Mary together} \rrbracket =$
 $\lambda P \lambda e [P(e) \wedge \text{ag}(e)=j \oplus k \oplus m \wedge \forall e' \leq e [P(e') \rightarrow \text{ag}(e')=j \oplus k \oplus m]]$


(3.24)

- a. #Masha, Petia i Ania vmeste uvideli drug druga.
Mary Peter and Ann together saw each other
- b. $\llbracket \text{Mary, Peter and Ann together} \rrbracket (\text{see each other}) =$
 $\lambda e [\text{see-eo}(m \oplus p \oplus a)(e) \wedge \forall e' \leq e [\text{see-eo}(e') \rightarrow \text{ag}(e') = m \oplus p \oplus a]]$

Now, let us try and derive a Russian sentence that combines adnominal *vmeste* ‘together’ and a reciprocal predicate (3.24a). Regardless of which theory of reciprocals we consider, Lasersohn (1990) requires the sentence to be true of events in which *Mary, Peter, and Ann saw each other* is true, and any smaller reciprocal seeing event e' has to have *Mary, Peter, and Ann* as an agent (3.24b). Below I show that scenarios in which this requirement is met do exist, as opposed to what we would expect on these theories given that the sentence in (3.24) is odd.

Consider a scenario in which Mary sees Peter, Peter sees Ann, and Ann sees Mary (3.25a). This scenario can be felicitously described by the sentence *Mary, Peter and Ann saw each other*, according to both Dotlačil and LaTerza. Now consider events e' (3.25b) and e'' (3.25c) that are proper parts of the event e describing the scenario in (3.25a) and whose agent is also a proper part of *John, Mary and Kim*, e.g. *John and Mary* (or any combination of the two between *John, Mary and Kim*) in (3.25b) and *John* (or Mary or Kim) in (3.25c). John sees Mary and Mary sees Kim in e' , but, according to both Dotlačil and LaTerza, e' is not a reciprocal seeing event, since Kim doesn't see anybody. The same is true for e'' , in which only John sees Mary (3.25c), as well as for any other event smaller than e . That is, Lasersohn (1990), in conjunction with the theories of reciprocals that I consider here, predicts that e can be felicitously described by (3.24a), contrary to native speakers' intuition.

a. e : John \rightarrow Mary

 Kim

b. e' : John \rightarrow Mary

 Kim

c. e'' : John \rightarrow Mary
 Kim

Now let us again apply these theories to Russian and derive an (ungrammatical) sentence that combines adnominal *vmeste* ‘together’ and a reciprocal predicate (3.27a). The truth conditions for (3.27a) are in (3.27b): (3.27a) is true iff *The boys saw each other* is true, and the additive measurement function f induced by reciprocal *see each other* is the function that takes an individual X and returns a minimal number of seeing events needed for every atom in X to see some other individual in X . In this case, the relevant property of real numbers would be being equal to or more than the number of the boys

(see the definition in (3.15)). If this configuration is allowed by Moltmann, then (3.27a) is predicted to be grammatical, according to both LaTerza and Dotlačil, and contrary to speakers' intuition.

(3.26)

a. The boys saw each other.

b. $\exists e. \forall x \leq \oplus \text{boy} \exists y \leq \oplus \text{boy} \exists e' \leq e. \text{see}(e') \wedge \text{ag}(e')=x \wedge \text{th}(e')=y$ *LaTerza*

c. $\exists e. \forall x \leq \oplus \text{boy} \exists y, z \leq \oplus \text{boy} \exists e' \exists e'' \leq e [\text{see}(e') \wedge \text{ag}(e')=x \wedge \text{th}(e')=y \wedge \text{see}(e'') \wedge \text{ag}(e'')=z \wedge \text{th}(e'')=x]$ *Dotlačil*

(3.27)

a. #Malchiki vmeste uvideli drug druga
 boys together saw.PL each other

b. see e-o($\oplus \text{boy}$) \wedge

together($\oplus \text{boy}$; $\lambda X. \min(\lambda e. \forall x \leq X: \text{atom}(x) \rightarrow \exists y \leq X [\text{see}(e) \wedge \text{ag}(e)=x \wedge \text{th}(e)=y])$;

$\lambda n. n \geq |\oplus \text{boy}|$) *Moltmann*

A further problem with Moltmann's theory is that it puts the event framework aside whereas adnominal *together* still does allow for event-related readings, as in (3.17) for telic predicates. The modification I will propose fixes this problem.

Since both Dotlačil and LaTerza wrongly predict that Lasersohn's (1990) adnominal *together* should be compatible with reciprocals, and so does Moltmann, I conclude that these theories of *together* cannot explain Russian adnominal *vmeste*, and a new approach is needed.

3.5 My theory

In the previous sections, I have shown that current theories of adnominal *together* make wrong predictions about the Russian data outlined in Section 2. I claim that my event-based approach to adnominal *vmeste* 'together' correctly predicts the impossibility of scenarios involving group credit in sentences with adnominal *vmeste*, as well as its incompatibility with reciprocal predicates and with distributive predicates.

I propose the following denotation for adnominal *vmeste*. It takes an individual x and a predicate P and returns a set of events such that e is in P , x is agent of e , and e is a sum of e' , such that e' has an atomic agent and is not a P -ing event.

(3.28)

$$\llbracket vmeste_{ADNOMINAL} \rrbracket = \lambda x \lambda P \lambda e. P(e) \wedge \underline{ag(e)=x \wedge e \in {}^* \lambda e' (atom(ag(e')) \wedge \neg P(e'))}$$

The meaning of adnominal *vmeste* is different from the meaning of *vmeste* in the *together-with* construction developed in Chapter II. Unfortunately, in this dissertation I have not found a way to unify these two different uses of *vmeste*.

The underlined conjunct in (3.28) is the main contribution *vmeste* makes: it requires that every atomic member of x makes some contribution, but this contribution cannot qualify as *P*-ing. This denotation of adnominal *vmeste* rules out scenarios involving group credit, since it explicitly requires for every member of x to contribute. Consider again the example in (3.3), repeated here in (3.29). (3.29) is true of events e such that Peter and Maria bake a pie in e , and e is a sum of two events e_1 and e_2 such that Peter is the agent of e_1 , and Maria is the agent of e_2 , and neither e_1 nor e_2 are pie-baking events (3.30). That is, it is impossible that it is Maria who bakes the whole pie and Peter does nothing. Peter has to participate in pie-baking.

(3.29) *At a potluck party, Peter and Maria are a couple:*

Petia i Masha vmeste ispekli pirog.

P_{NOM} and M_{NOM} together baked.PL pie

‘Peter and Maria together baked a pie’

Both Peter and Maria are required to contribute, FALSE if it is Maria who baked a pie.

(3.30)

$$\begin{aligned} & \lambda e. \text{bake}(e) \wedge \text{ag}(e)=p \oplus m \wedge \text{pie}(\text{th}(e)) \wedge e \in^* \lambda e' [\text{atom}(\text{ag}(e')) \wedge \neg(\text{bake}(e') \wedge \text{pie}(\text{th}(e')))] = \\ & \lambda e. \text{bake}(e) \wedge \text{ag}(e)=p \oplus m \wedge \text{pie}(\text{th}(e)) \wedge \exists e_1 \exists e_2: e=e_1 \oplus e_2 \wedge \text{ag}(e_1)=p \wedge \text{ag}(e_2)=m \wedge \\ & \neg(\text{bake}(e_1) \wedge \text{pie}(\text{th}(e_1))) \wedge \neg(\text{bake}(e_2) \wedge \text{pie}(\text{th}(e_2))) \end{aligned}$$

The denotation in (3.28) also explains the incompatibility of adnominal *vmeste* and distributive predicates, i.e. *smile* (3.31). (3.31a) is true of smiling events e that are a sum of two events e_1 and e_2 , such that Peter is the agent in e_1 , and Maria is the agent in e_2 , and neither e_1 nor e_2 are smiling events. On the other hand, distributive *smile* requires that every e is a sum of two events e_1' and e_2' , such that Peter smiles in e_1' , and Maria smiles in e_2' . I conjecture that the requirements imposed by *vmeste* and by the distributivity of *smile* are incompatible. To put it simply, for (3.31a) to be true, Peter and Maria have to contribute something that would not classify as smiling, yet the sum of their coordinate efforts would qualify as a smile.

(3.31)

a. *Petia i Masha vmeste ulybnulis.

P._{NOM} and M._{NOM} together smiled._{PL}

b. *vmeste* requirement:

$$\lambda e. \text{smile}(e) \wedge \text{ag}(e)=p \oplus m \wedge \exists e_1 \exists e_2: [e=e_1 \oplus e_2 \wedge \text{ag}(e_1)=p \wedge \text{ag}(e_2)=m \wedge \neg \text{smile}(e_1) \wedge \neg \text{smile}(m)(e_2)]$$

c. Distributivity requirement:

$$\lambda e. \text{smile}(e) \wedge \text{ag}(e)=p \oplus m \wedge \exists e_1' \exists e_2': [e=e_1' \oplus e_2' \wedge \text{smile}(e_1') \wedge \text{smile}(e_2') \wedge \text{ag}(e_1')=p \wedge \text{ag}(e_2')=m]$$

Finally, (3.28) correctly predicts that adnominal *vmeste* is incompatible with reciprocals. This is true if we assume that the antecedent of *each other* is a plural individual. This is true, indeed: both atomic individuals and group denoting terms are incompatible with reciprocal predicates in Russian (3.32). LaTerza (2014) explicitly makes this claim, but Dotlačil (2010) does not. Assuming that reciprocal predicates are defined only for plural individuals gives correct predictions for the sentence in (3.33). This sentence is true of reciprocal seeing events that are a sum of two events e_1 and e_2 with atomic agents that are not reciprocal seeing events. However, on the assumption that reciprocal predicates are only defined for plural individuals, $\neg \text{see-eo}(e_1)$ is not defined (3.35a).

(3.32)

a. *Petia uvidel drug druga.

P._{NOM} saw._{SG} each other

b. *Klass uvidel drug druga.

class saw._{SG} each other

(3.33)

a. *Petia i Masha vmeste uvideli drug druga.

Peter and Maria together saw._{PL} each other

b. $\lambda e. \text{see-eo}(e) \wedge \text{ag}(e) = p \oplus m \wedge \exists e_1 \exists e_2: e = e_1 \oplus e_2 \wedge \text{ag}(e_1) = p \wedge \text{ag}(e_2) = m \wedge$

$\neg \text{see-eo}(e_1) \wedge \neg \text{see-eo}(e_2)$

In a way, the meaning I propose for adnominal *together/vmeste* is very simple: it just explicitly blocks group-credit interpretation, requiring all atomic individuals in the denotation of the group to participate in the event. This simple proposal explains a wide range of phenomena, namely the incompatibility of the adnominal *vmeste* ‘together’ with distributive and reciprocal predicates.

3.5.1 Lasersohn (1990)

Similar to Lasersohn (1990), my proposal is based on events. As mentioned above, the proposal in Lasersohn (1990) does not work for adnominal *vmeste*, as it overgenerates, due to the free variable *f*, and overgenerates a spatiotemporal reading for adnominal *vmeste*, among others. In fact, adnominal *vmeste* does not exhibit the range of readings that would require a free variable and does not seem to be ambiguous in the way English adverbial *together* is. Accordingly, my goal has been to find the most precise way to formulate the meaning of adnominal *vmeste*, but not to express the ambiguity of *together* in general.

While Lasersohn's theory works for examples that involve group credit (3.29), it makes wrong predictions about the compatibility of reciprocal predicates and adnominal *vmeste*. Lasersohn (1990) predicts that, in certain scenarios, reciprocal predicates should be compatible with adnominal *together*, and the sentence is true of "minimal" reciprocal events. My theory avoids this problem.

3.5.2 Potential Problem: “Downward Entailing” Contexts

My analysis of adnominal *vmeste* ‘together’ potentially runs into the same problem as Lasersohn (1990). As Schwarzschild (1992) notes, Lasersohn’s analysis incorrectly predicts the following sentences to be ungrammatical (3.34).

(3.34)

- a. John and Mary together lifted fewer than three pianos.
- b. John and Mary together lifted between two and four pianos.
- c. These two boxes together are light enough to carry.

My analysis of adnominal *vmeste* predicts that, for example, the Russian translation of (3.34a) in (3.35a) should be analyzed as (3.35b): (3.35a) is true of any event e that is a sum of two events e_1 and e_2 such that John did something in e_1 that does not qualify as lifting less than 3 pianos, and Mary did something in e_2 that does not qualify as lifting less than 3 pianos. This predicts that (3.35a) is false in a scenario where Mary lifted one piano and John lifted one piano, contrary to speakers’ intuition.

(3.35)

a. Vania i Masha vmeste podniali menshe chem tri pianino.

J._{NOM} and M._{NOM} together lifted.PL less than three pianos

‘John and Mary together lifted fewer than three pianos’

$$\text{b. } \lambda e. \text{ lift-less-3}(e) \wedge \text{ag}(e)=j \oplus m \wedge \exists e_1 \exists e_2: [e=e_1 \oplus e_2 \wedge \text{ag}(e_1)=j \wedge \text{ag}(e_2)=m \wedge \neg \text{lift-less-3}(e_1) \\ \wedge \neg \text{lift-less-3}(e_2)]$$

The examples in (3.34) bring us back to Moltmann's idea of a cumulative measurement induced on *together*-NPs. In general, measurement predicates seem to expose a problem for a wider range of related problems. For example, they are a problem for Champollion's (2017) treatment of the *gather* / *numerous* distinction.

The so-called *gather* / *numerous* predicate distinction is defined based on the compatibility of a predicate with *all*: *gather*-type predicates are those collective predicates compatible with *all*, and *numerous*-type predicates are those that are not (3.36).

(3.36)

a. *Gather*-type: All the boys gathered / met in the hall.

b. *Numerous*-type: *All the boys are numerous / a group of 5 people.

Champollion (2017) proposes that *all* requires the predicate to have what he calls stratified reference along the agent dimension with granularity that is small enough, that is, it requires that any event *e* in the denotation of the predicate can be divided into one or more events in the denotation of the predicate whose agents are each small in

number compared to the agent of *e*. He claims that *gather*-type predicates meet this requirement, whereas *numerous*-type predicates do not.

Champollion's diagnostics does not work for *numerous*-type measurement predicates in contexts similar to those where my analysis of adnominal *together* experiences problems. Whereas the sentences in (3.37) are ungrammatical, one can see that predicates *be a group of less than ten / between two and four / small enough* do have stratified reference along the agent dimension, which predicts these sentences to be grammatical.

(3.37)

- a. *All the students are a group of less than ten.
- b. *All the students are a group between two and four.
- c. *All the students are a small enough group.

Kuhn (2015) drafts a tentative analysis of this problem using Fine's (2012) approach to measurement predicates. Kuhn assumes that the denotation of a measurement predicate is a set of events witnessing exact measurements. That is, the sentence in (3.34a) is witnessed by the events in which *John and Mary together lifted exactly two pianos* and by the events in which *John and Mary together lifted exactly one piano*, and thus the requirement imposed by adnominal *vmeste* 'together' can be met in the manner described in the sections above.

3.6 Summary and conclusion

In this chapter I have taken a look at the adnominal use of *vmeste* ('together'), reviewed the current theories of *together* and identified a number of problems that none of these theories can explain at once.

The problems are the following. First, adnominal *vmeste* has no spatiotemporal proximity reading, in contrast to adverbial *vmeste*. Second, adnominal *vmeste* has no group credit readings. Finally, it is not compatible with distributive predicates like *smile* and reciprocal predicates like *see each other*.

I propose a new event-based approach for the meaning of adnominal *vmeste*. In a way, it is a simplification of Lasersohn (1990) — my adnominal *vmeste* explicitly blocks group-credit readings, and the incompatibility of adnominal *together* with distributive and reciprocal predicates arises as a consequence of that.

I treat adnominal *vmeste* ('together') and *vmeste* in the *together-with* construction as two separate lexical entries.

CHAPTER IV: *VMESTE* ‘TOGETHER’ AND COLLECTIVE PREDICATES

4.1 Introduction

In the previous chapters of this dissertation I have discussed two comitative constructions of Russian, the *with*-construction and the *together-with* construction, as well as adnominal *vmeste*, but did not focus on the combination of either of these constructions with collective predicates. This chapter is devoted to this combination.

I claim that the sensitivity of the *together-with* construction and adnominal *vmeste* ‘together’ to predicate reciprocity explains the incompatibility of these constructions with certain collective predicates. I explain this by adopting Hackl’s claim (2002) that *essentially plural* predicates have a covert reciprocal component, in combination with the theory of the *together-with* construction and adnominal *vmeste* ‘together’ developed in the previous chapters.

The chapter is organized as follows. In Section 4.2, I give a preliminary overview of the data. In Sections 4.3 and 4.4, I describe the main idea of the chapter and present a formal fragment. Section 4.5 reviews alternative theories of collective predicates. Section

4.6 motivates the experimental study in Section 4.7, which tests Champollion's theory (2017) against Hackl's theory (2002). Section 4.8 concludes.

4.2 Puzzle / preliminary data

In Russian, collective predicates are not uniform with respect to their behavior when in combination with the *together-with* construction or adnominal *vmeste*. Nominal constructions involving *vmeste* are only compatible with certain collective predicates, unlike the *with*-construction.

For the *with*-construction, the picture is rather straightforward (4.1a): the *with*-construction is compatible with all collective predicates, similar to *and*-coordination (4.1b). Things are different for the *together-with* construction: it is only compatible with some collective predicates, but not with others. For example, it is compatible with *byt gruppoy iz X chelovek* ('be a group of X people') (4.2a), but not with *vstretitsja* ('meet') (4.2b). Adnominal *together* shows the same distribution as the *together-with* construction (4.3).

(4.1)

a. *with*-construction

Petia s devochkami sobralis / vstretilis / byli paroj / gruppoj iz 3 chelovek.

P._{NOM} with girls._{INST} gathered._{PL} / met._{PL} / were couple / group of 3 people

‘Peter and the girls gathered / met / were a couple / were a group of three people’

b. *and*-coordination

Petia i devochki sobralis / vstretilis / byli paroj / gruppoj iz trex chelovek.

P._{NOM} and girls._{NOM} gathered._{PL} / met._{PL} / were couple / group of three people

‘Peter and the girls gathered / met / were a couple / were a group of three people’

(4.2) *together-with* construction

a. Petia vmeste s devochkami gruppa iz trex chelovek.

P._{NOM} together with girls._{INST} group of three people

‘Peter and the girls are a group of two people’

b. *Petia vmeste s devochkami vstretilis

P._{NOM} together with girls._{INST} met._{PL}

(4.3) Adnominal *vmeste*

a. Petia i devochki vmeste gruppā iz trex čelovek.

P._{NOM} and girls._{NOM} together group of three people

‘Peter and the girls together are a group of three people’

b. *Petia i devochki vmeste vstretilis.

P._{NOM} and devochki._{NOM} together met._{PL}

Furthermore, the status of certain sentences is not so clear. While speakers are certain about the incompatibility of the nominal constructions involving *vmeste* / *together* with *vstretitsja* (‘meet’), other collective predicates like *sobratsja* (‘gather’), *stolpitsja* (‘crowd’) or *okružhit* (‘surround’) cause a certain amount of doubt (4.4).

(4.4)

a. ?Petia vmeste s devochkami sobralis / stolpilis / okružhili stol

P._{NOM} together with girls._{INST} gathered._{PL} / crowded._{PL} / surrounded._{PL} table

Intended reading: “Peter and the girls gathered / crowded / surrounded the table”.

b. ?Petia i devochki vmeste sobralis / stolpilis / okružhili stol

P._{NOM} and girls._{NOM} together gathered._{PL} / crowded._{PL} / surrounded._{PL} table

Intended reading: “Peter and the girls gathered / crowded / surrounded the table”.

As I will explain in Section 4.4, the compatibility of these predicates with constructions involving *vmeste* ‘together’ is crucial for understanding whether it is the covert reciprocity of the predicate that makes the predicate incompatible with *vmeste* ‘together’ in the nominal domain or whether a less strict requirement should be adopted. Section 4.6 is an experimental study addressing this question that suggests that it is indeed the covert reciprocity of the predicate that matters.

4.3 Hackl (2002)

In the previous chapters, I explored the idea that *vmeste* ‘together’ in nominal constructions is incompatible with reciprocals. In this chapter, I propose that this incompatibility explains the facts outlined in the previous section. Hackl (2002) proposes a classification of collective predicates based on their covert reciprocity (similar ideas have been expressed by Levin, 1993; Gleitman et al, 1996, a. o.). I claim that this account explains the incompatibility of certain collective predicates with nominal constructions involving *vmeste*.

Hackl (2002) introduces the following classification of predicates: genuine collective predicates (4.5), pluralized individual predicates (4.6), and essentially plural predicates (4.7). Whereas, on his approach, genuine collective predicates inherently range over

pluralities (4.5), pluralized individual predicates are derived from distributive predicates via pluralization mechanisms (4.6).

(4.5) Genuine Collective Predicates

- a. *team, committee, group, herd, pack, ensemble, nation, couple*
- b. *outnumber, elect a president*
- c. *be numerous, be outnumbered*

(4.6) Pluralized Individual Predicates

- a. *students, professors*
- b. *have blue eyes, are blue-eyed, are fond of themselves*

(4.7) Essentially Plural Predicates

- a. *friends, neighbors, critics of each other*
- b. *meet, gather, disperse, collide, separate, mix, like each other, hate each other*
- c. *be similar, be different, be identical, be congruent, be familiar with each other*

Essentially plural predicates (4.7) are the most interesting: they may seem similar to pluralized individual predicates, but it is not clear what their underlying basic one-place predicate should be. Hackl claims that essentially plural predicates are inherently

reciprocal predicates derived from two-place predicates and offers the following generalization (4.8). He mostly focuses on nominal predicates, but suggests that his proposal can be extended to verbal and adjectival essentially plural predicates.

(4.8) Inherently symmetric relations that have a presupposition of non-identity have inherently reciprocal essentially plural predicate counterparts.

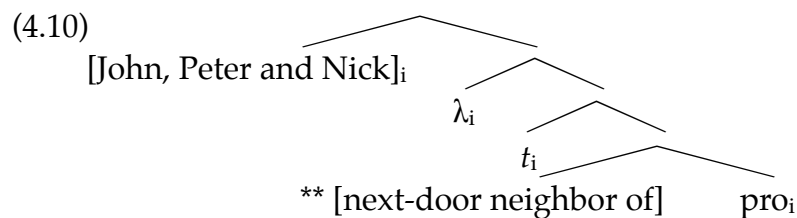
Hackl uses Sternefeld's (1986) $**$ operator to derive the desired meaning (4.9a) and then coindexes the two arguments. He assumes the derivation of *John, Peter and Nick are next-door neighbors* as follows (4.10): a silent pronoun is inserted into the internal argument position and this pronoun is co-indexed with the external argument of the relation.

(4.9)

a. $** = \lambda R \lambda x \lambda y. R(x)(y) \vee \exists x_1, x_2, y_1, y_2 [x_1 \oplus x_2 = x \wedge y_1 \oplus y_2 = y \wedge **R(x_1)(y_1) \wedge **R(x_2)(y_2)]$

b. $\llbracket \text{next-door neighbor of} \rrbracket = \lambda x \lambda y. x \text{ is a next-door neighbor of } y$

c. $\llbracket \text{next-door neighbors}_{\text{collective}} \rrbracket = \lambda x. [**\text{next-door neighbor of}](x)(x)$



The truth conditions of (4.9c) are identical to the truth conditions of the weak reciprocal reading (4.11a), which Hackl assumes to be the basic meaning of essentially plural predicates, whereas essentially plural predicates that have stronger requirements (*friends, colleagues, etc.*) (4.11b) achieve their meaning via pragmatic strengthening.

(4.11)

a. Weak Reciprocity (WR): $\forall x \in A \exists y, z \in A [x \neq y \wedge x \neq z \wedge xRy \wedge zRx]$

The children gave each other a present.

'Every child gave and received a present'

b. Strong Reciprocity (SR): $\forall x, y \in A [x \neq y \rightarrow xRy]$

Legislators must refer to each other indirectly.

'Every legislator must refer to every other legislator indirectly'

(4.12)

| <u>collective</u> | <u>reciprocal</u> | <u>2-place predicate</u> |
|---------------------------------|-----------------------------|--------------------------|
| a. A and B met | A and B met each other | A met B |
| b. A and B are familiar | A and B are familiar to e/o | A is familiar to B |
| c. mix A and B | mix A and B with e/o | mix A with B |
| d. A i B vstretilis meet | A i B vstretili drug druga | A vstretil B |
| e. A i B znakomy be familiar | A i B znakomymi drug drugu | A znakom Y |
| f. smeshat A i B mix | smeshat A i B drug s drugom | smeshat A s B |

Table 2: Collective predicates and corresponding reciprocal predicates and 2-place predicates

Symmetric relations do seem to have essentially plural predicate counterparts that are identical in meaning to corresponding reciprocal predicates, both in English and in Russian (4.12).

There also exists a range of examples that are not covered by Hackl's proposal, but show similar behavior. First, transitive *kiss* is not a symmetrical predicate yet collective *kiss* is a legitimate collective predicate (4.13a). There are claims that collective *kiss* and reciprocal *kiss each other* can have different meanings (Rubinstein, 2009): (4.13a) means that *John and Mary simultaneously touch each other's lips*, and (4.13b) might mean *John and*

*Mary kissed each other's cheeks (maybe even not simultaneously).*⁶ For more discussion of collective events, see Dimitriadis (2008) and Rubinstein (2009).

(4.13)

- a. John and Mary kissed.
- b. John and Mary kissed each other.

Hackl's proposal does not cover predicates that do not have a corresponding two-place predicate, even though he includes them in the list of essentially plural predicates: *gather, disperse, swarm, surround*. These predicates seem to pattern in other aspects with the predicates that his theory covers, such as compatibility with *all* (4.14).

(4.14)

- a. All the boys met / are alike / are friends.
- b. All the boys gathered / dispersed / swarmed / surrounded the fort.

Hackl, however, remains agnostic on whether the compatibility with *all* is the result of the covert reciprocity of the predicate, as well as on the structure of predicates that are not compatible with *all*, such as *be numerous*.

⁶ Some speakers reject this judgement. The following sentence is judged as allowing cheek kissing:

(i) Merkel and Macron kissed, and Trudeau and Obama shook hands.

4.4 My proposal

According to Hackl, essentially plural predicates have a weakly reciprocal reading as in (4.15a). In the event framework used in this dissertation, it can be reformulated as in (4.15b). Importantly, I assume (4.15b) is only defined for plural individuals, since it refers to their non-identical subparts.

(4.15)

- a. $\llbracket \text{meet}_{\text{COLLECTIVE}} \rrbracket = \lambda x. \forall x_1 \leq x \exists y, z \leq x [x_1 \neq y \wedge x_1 \neq z \wedge \text{meet}(x_1, y) \wedge \text{meet}(z, x_1)]$
- b. $\llbracket \text{meet}_{\text{COLLECTIVE}} \rrbracket = \lambda e: \neg \text{atom}(\text{ag}(e)). \forall x \leq \text{ag}(e) \exists y \exists z \leq \text{ag}(e). \exists e_1 \exists e_2 [x \neq y \wedge x_1 \neq z \wedge \text{meet}(e_1) \wedge \text{ag}(e_1)=x \wedge \text{th}(e_1)=y \wedge \text{meet}(e_2) \wedge \text{ag}(e_2)=z \wedge \text{th}(e_2)=x]$

In Chapter III, I have proposed the following meaning for adnominal *vmeste* ‘together’ (4.16a). The meaning of a *together*-NP phrase *devochki vmeste* ‘girls together’ is in (4.16b), and the meaning of a sentence that combines a collective predicate and adnominal *vmeste* ‘together’ is in (4.17).

(4.16)

- a. $\llbracket \text{vmeste}_{\text{ADNOMINAL}} \rrbracket = \lambda x \lambda P \lambda e. P(e) \wedge \text{ag}(e)=x \wedge e \in * \lambda e' (\text{atom}(\text{ag}(e')) \wedge \neg P(e'))$
- b. $\llbracket \text{devochki vmeste} \rrbracket = \lambda P \lambda e. P(e) \wedge \text{ag}(e)=\oplus \text{girl} \wedge e \in * \lambda e' (\text{atom}(\text{ag}(e')) \wedge \neg P(e'))$

(4.17)

a. *Devochki vmeste vstretilis.

girls together met.PL

b. $\lambda e. \text{meet}_{\text{coll}}(e) \wedge \text{ag}(e) = \oplus \text{girl} \wedge e \in * \lambda e' (\text{atom}(\text{ag}(e')) \wedge \neg \text{meet}_{\text{coll}}(e'))$

The expression in (4.17b) is true of collective meeting events that are a sum of events with atomic agents that are not collective meeting events. However, since collective predicates are only defined for plural individuals, $\neg \text{meet}_{\text{coll}}(\text{ag}(e'))(e')$ is not defined, and the sentence in (4.17) gets no truth value.

(4.18) *Together-with* construction: Mike together with Peter

$\llbracket \text{Misha vmeste s Petej} \rrbracket = \uparrow \iota(\text{coll}(\lambda x \lambda y. y = m \wedge R_1(x, y) \wedge x = p \wedge R_2(y, x))) = \uparrow(m \oplus p)$

(4.19)

*Misha vmeste s Petej vstretilis.

M.NOM together with P.INST met.PL

$\lambda e. \text{meet}_{\text{coll}}(e) \wedge \text{ag}(e) = \uparrow(m \oplus p)$

A similar mechanism should rule out the combination of essentially plural predicates with the *together-with* construction. As I claim in Chapter II, the *together-with*

construction forms an impure atom (4.18), and since essentially plural predicates are not defined for atomic subjects, (4.19) gets no truth value.⁷

4.5 Previous work

In this section, I discuss theories of collective predicates that are alternatives to Hackl (2002). I show that Dowty (1987), Brisson (2003) and Winter (2002) cannot account for the data in (4.2) and (4.3), and a combination of Champollion (2017) and the theory of *vmeste* ‘together’ makes no prediction about the data in Section 4.1. I then proceed to an experimental study that shows that *vmeste* ‘together’ is sensitive to the covert reciprocity of the predicate or a less specified requirement should be employed.

4.5.1 Dowty (1987)

Dowty (1987) is one of the first to consider the question of compatibility of *all* and various collective predicates. He aims to explain the contrast between (4.20a) and

⁷ In principle, my proposal only requires predicates that are incompatible with constructions involving *vmeste* to be incompatible with atoms, and it is not necessary to assume that they are covert reciprocals. The covert reciprocity of essentially plural predicates might seem to be not fully supported by any external evidence, and it is not clear if these predicates are identical to overt reciprocals, as Dimitriadis (2008) and Rubinstein (2009) suggest. However, predicates like *vstretitsja* are indeed incompatible with atomic subjects, at least in the case of subjects that do not denote groups. This is as expected if they are covert reciprocals, and would need to be stipulated otherwise.

(i) *Misha vstretilsja
Mike met._{SG}

(4.20b): certain collective predicates, such as *gather*, are compatible with *all*, whereas collective predicates, such as *be numerous*, are not.

(4.20)

a. *All the students are numerous.

b. All the students gathered in the hall.

Dowty's explanation to this contrast is that *all* requires the collective predicate to fully distribute the predicate's sub-entailments to every member of the argument. By sub-entailments he understands "entailments that cannot be described by applying the predicate itself to individual members". For example, (4.20b) requires that *every student goes to the hall and spends enough time there to meet other students*. At the same time, (4.20a) says nothing specific about individual students.

Dowty's proposal also explains the maximality effect of *all*: whereas (4.21a) only says that the required number of students cast their votes to accept the proposal, (4.21b) says that *every one of the students cast a vote to accept the proposal*. In part, Dowty's proposal is a reflection of Link's (1983) 'partake in' operator (x takes-part-in P when x is a part of some group in P and when x is in P in case P is distributive).

(4.21)

- a. The students voted to accept the proposal.
- b. All the students voted to accept the proposal.

Dowty proposes the following classification of predicates (4.22). According to his hypothesis, purely distributive predicates (I) and collective predicates with distributive sub-entailments (II) are predicted to be compatible with *all*, but purely collective predicates (III) are not. Mixed predicates (IV) are ambiguous between collectives with both collective and distributive entailments and distributives. Indexically-collective predicates (V) are a separate group of predicates that are predicted to be compatible with *all* as having the sub-entailment “assign a particular integer to *x*”.

(4.22) Dowty’s classification of predicates:

I. Purely distributive predicates: *fall asleep, be pregnant, eat apples*

II. Collective predicates with distributive sub-entailments

- a. Collectives whose only entailments may be distributive sub-entailments: *gather, summarize (object argument)*

- b. Collectives with both collective and distributive entailments: *vote to do X, be a happy couple, meet for lunch, surround the fort*

- III. Purely collective predicates: *be numerous, be few in number, be a large group*. Less clear examples (according to Dowty): *be dense, be sparse*
- IV. Predicates ambiguous between Collective (IIb) and Distributive: *build a cabin, carry a piano upstairs*
- V. Predicates ambiguous between Collective (IIb) and indexically-collective distributive: *count, enumerate (object arguments)*.

Dowty proposes that collective predicates like *meet* fully distribute the predicate's sub-entailments to every member of the argument. At the same time, adnominal *vmeste* requires that every member of the argument is an agent of some event that is not in the denotation of the predicate, and this requirement is based on the fact that adnominal *vmeste* rules out group credit readings (4.23).

(4.23) *At a potluck party:*

- | | | | | |
|------------------------|-------------------|----------------------|----------------------|-----------------------------|
| a. Petia | i | Masha ispekli pirog. | b. Petia i | Masha vmeste ispekli pirog. |
| Peter | and | Maria baked pie | Peter and Maria | together baked pie |
| Peter and Maria | baked a pie. | | Peter and Maria | together baked a pie. |
| OK if it is only Maria | who bakes the pie | | Both Peter and Maria | have to contribute |

(4.24)

*Misha i Petia vmeste vstretilis/ sobralis.

Mike and Peter together met / gathered

By sub-entailments Dowty means “entailments that cannot be described by applying the predicate itself to individual members”. It is not clear whether this applies to the requirement imposed by *vmeste*, but if it does, then (4.24) should be acceptable, contrary to speakers’ intuition. That is, Dowty’s theory is insufficient to explain the data.

4.5.2 Taub (1989) & Brisson (2003)

Taub (1989) offers her own observation. She claims that *all* is compatible with achievement and state predicates, but not accomplishment or activity predicates.

Taub uses the *aktionsarten* classification of predicates proposed by Vender (1967) and identifies four categories of predicates: achievements, states, accomplishments and activities. State predicates have no continuous processes associated with them. Distributive predicates, such as *believe* or *know* or *be young / sick / beautiful*, are states. Activity and accomplishment predicates are processes. Accomplishments are processes with a definite endpoint: *build a raft*, *read a book*, or *walk two miles*. Activities are homogeneous processes with no endpoint: *walk*, *read*, *push a cart* or *study linguistics*.

Achievement predicates are similar to accomplishments in that they have an end point, but they have no process associated with them. Examples include *win the race*, *notice the painting* or *reach the summit*. The following examples illustrate Taub's observation:

(4.25) Collective states:

- a. *All the boys are a big group.
- b. *All the trees are dense in the middle of the forest.

(4.26) Collective activities:

- a. All the boys carried the piano around for an hour.

(4.27) Collective accomplishments:

- a. All the students gathered in the hallway.
- b. All the girls built a raft.

(4.28) Collective achievements:

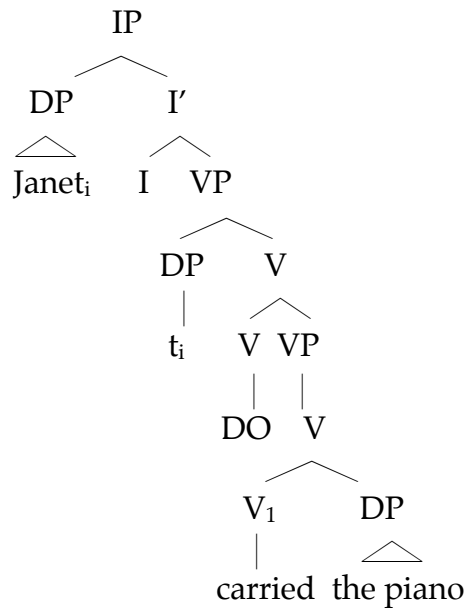
- a. *All the senators passed the pay raise.
- b. *All the students elected a president.

Brisson (2003) follows Taub's observation and proposes a compositional account of the predicate compatibility with *all*. She claims that collective processes (activities and

accomplishments) are compatible with *all* because these predicates have a component that she calls “DO” as a part of their lexical meaning, as in (4.29).

(4.29)

Janet carried the piano.

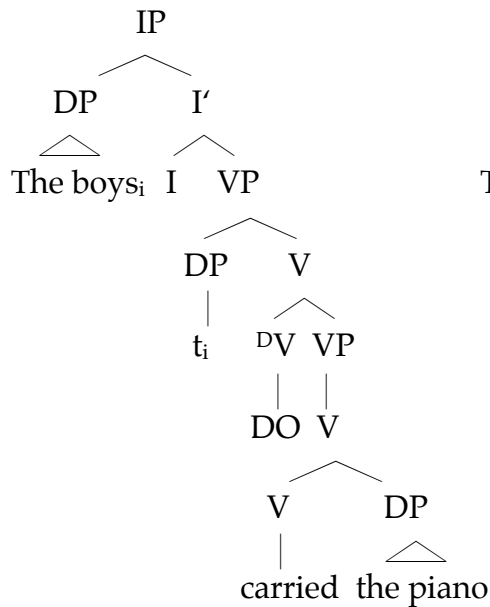


The distinction between distributive and collective readings is captured by the two possible insertion sites for a distributivity operator: on DO, which yields a collective reading (4.30b), and on the VP dominating DO, which yields a distributive reading (4.30c).

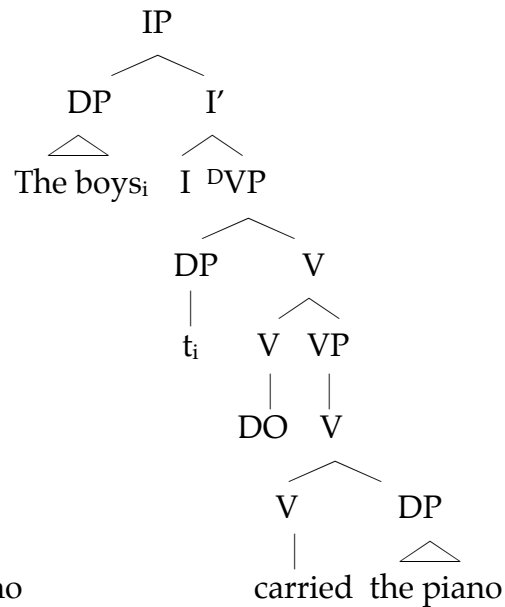
(4.30)

a. The boys carried the piano.

b. Collective



c. Distributive



(4.31)

a. *All the boys are a big group.

state

b. All the boys form a big group.

accomplishment

Brisson identifies two types of collective predicates: those that have DO as a component (activities and accomplishments) and those that do not (states and achievements). The syntactic representation of collective activities and accomplishments is as in (4.30), whereas states and achievements lack the DO component and have no insertion sites for a distributivity operator. She then claims that *all* is licensed by the

presence of a distributivity operator, and therefore is not compatible with states and achievements: see (4.31a) and (4.31b).

Brisson proposes that *all* requires the verb phrase to have the DO component, collective activities and accomplishments being the only types compatible with *all*.

This hypothesis, however, has counterexamples. Many of Hackl's essentially plural predicates are states, yet compatible with *all*: *be alike*, *be similar*, *be familiar*. Similarly, collective predicates like *agree* or *disagree* are achievements, yet compatible with *all*:

(4.32)

Finally, all of the boys agreed / disagreed.

Adnominal *vmeste* 'together' does not follow Brisson's categorization either: it is compatible with mixed predicates, which can be both accomplishments and achievements (4.33), but not with predicates like *meet* or *be alike* (4.34), which can be both accomplishments and states. That is, the DO component is not indicative of whether the predicate is compatible with adnominal *together*.

(4.33) Mixed predicates:

- | | |
|--|-----------------------|
| a. The boys together built a raft. | <i>accomplishment</i> |
| b. The boys together elected a president . | <i>achievement</i> |

(4.34) Collective activities:

- a. *The boys together are alike. *state*
- b. *The boys together met. *accomplishment*

4.5.3 Winter (2001)

Similarly to the previous authors, Winter (2001) recognizes the puzzle that certain collective predicates are not compatible with *all* (4.35b). He calls these predicates *pure cardinality predicates*. Winter also notes that group nouns make it possible to combine these predicates with *all* (4.35c).

(4.35)

- a. All the boys gathered.
- b. *All the boys were numerous.
- c. All the committees were numerous.

Winter steps aside from the collective-distributive distinction of predicates and proposes the following classification of predicates, based on whether or not the predicate distinguishes between singular quantificational determiners like *every* and

plural quantificational determiners like *all*. Atom predicates (4.36) do not distinguish between *every* and *all*, whereas set predicates do so (4.37).

(4.36) Atom predicates

- a. All the committees are numerous \Leftrightarrow Every committee is numerous.
- b. All the girls smiled \Leftrightarrow Every girl smiled.

(4.37) Set predicates

- a. All the girls gathered. \nLeftrightarrow Every girl gathered.
- b. All the committees gathered. \nLeftrightarrow Every committee gathered.

As can be seen from (4.36) and (4.37), both distributive predicates like *smile* and collective predicates that are incompatible with *all* fall into the category of atom predicates, whereas collective predicates that are compatible with *all* are set predicates.

Finally, mixed predicates like *build a raft* are ambiguous between set and atom realizations (4.38). The distributive interpretation of the predicate (4.38a) corresponds to its atom realization, since it does not distinguish between *all* and *every*. The collective interpretation of the predicate (4.38b) corresponds to its set realization, since it does distinguish between *all* and *every*.

(4.38) Mixed predicates

a. Distributive: All the girls built a raft. \Leftrightarrow Every girl built a raft. *atom*

b. Collective. All the girls built a raft. \nLeftrightarrow Every girl built a raft. *set*

Winter bases his theory on whether *every* and *all*, in combination with the predicate, give rise to equivalent readings. According to his theory, distributive predicates and predicates like *be a group of two* are atom predicates, predicates like *meet* are set predicates, and mixed predicates are ambiguous between set predicates and atom predicates. The collective interpretation corresponds to a set denotation and the distributive interpretation corresponds to an atom denotation.

The range of readings of adnominal *vmeste* is not compatible with Winter's theory: adnominal *vmeste* is compatible with mixed predicates in their collective instantiation (set denotation) and with predicates like *be a group of two* (atom denotation), and is not compatible with mixed predicates in their distributive instantiation (atom denotation) or with predicates like *meet* (set denotation). That is, the set/atom distinction introduced by Winter is not indicative of the compatibility of the predicate and adnominal *vmeste*.

(4.39)

a. Masha i Petia vmeste postroili plot / gruppā iz dvux chelovek.

M._{NOM} and P._{INST} together built._{PL} raft / group of two people

'Mary and Peter collectively built a raft / are a group of two people'

b. Masha i Petia vmeste postroili plot / *vstretilis.

M._{NOM} and P._{INST} together built._{PL} raft / met

#‘Mary and Peter each built a raft / met’

4.5.4 Champollion (2017)

Champollion (2017) proposes a binary classification of collective predicates that is close to Hackl’s genuine collective/essentially plural and Winter’s atom/set distinction. Champollion identifies *gather*-type and *numerous*-type predicates and proposes the *subgroup distributivity hypothesis* (4.40).

(4.40) The subgroup distributivity hypothesis:

Gather-type predicates are those that distribute down to subgroups of small cardinality. Informally, if a collective predicate holds of a plural entity *X*, it will be a *gather*-type predicate just in case there is a way to divide *X* into at least two small, possibly overlapping subgroups (usually pairs or triples) such that the predicate applies to each of these subgroups.

Indeed, for (4.41a) to be true, the sentences in (4.41b) need to be true as well, and for (4.42a) to be true, *John*, *Mary* and *Nancy* need to form some “chain” where the first two

of them are next-door neighbors and then the next two are next-door neighbors as well (4.42b). By contrast, (4.43) does not require that any two of *John*, *Mary* and *Nancy* are a group of three — moreover, that would be plain false.

(4.41)

a. John, Mary and Nancy met / are alike / parted ways.

b. John and Mary met / are alike / parted ways.

Mary and Nancy met / are alike / parted ways.

(4.42)

a. John, Mary and Nancy are next-door neighbors.

b. X and Y are next-door neighbors.

Y and Z are next-door neighbors. where X, Y, Z are John, Mary, and Nancy

(4.43)

John, Mary and Nancy are a group of three.

The formal implementation of Champollion's proposal exploits his theory of stratified reference. A predicate *P* has universal stratified reference along dimension *d* with small granularity *g* if and only if any *x* in *P* can be divided into one or more parts in *P* that are each mapped by *d* to something in *g*:

(4.44)

$$SR_{d,g}(P) \Leftrightarrow \forall x[P(x) \rightarrow x \in {}^*\lambda y (P(y) \wedge g(d(y)))]$$

Gather-type predicates like *meet* are the predicates that have stratified reference with respect to their agent with granularity of two (or three), that is, every meeting event can be divided into one or more parts, each of which is a meeting event whose agent is two (three) people.

$$(4.45) SR_{agent, \lambda x. |x| \leq 2}(\lambda e. meet(e)) \Leftrightarrow \forall e[meet(e) \rightarrow e \in {}^*\lambda e' (meet(e') \wedge |agent(e')| \leq 2)]$$

Champollion claims that *all* requires verb phrases to apply to smaller parts of the plurality and therefore the fact that *gather*-type predicates have stratified reference explains their ability to combine with *all*.

Champollion's *gather*-type predicates include Hackl's essentially plural predicates and the predicates that Hackl lists as essentially plural predicates but points out that their binary counterparts are unclear, such as: *gather*, *surround* and *crowd*.

In combination with the theory of *vmeste* / *together* developed in the previous chapter, Champollion's theory makes no prediction about the combination of constructions involving *vmeste* and *gather*-type predicates that are not Hackl's essentially plural predicates.

The denotation in (4.46) requires that the sentence is true of gathering events e such that *the girls* gathered in e , and e is a sum of non-gathering events e' with atomic agents, and also e is a sum of gathering events e' with agents that are small enough, which is, in principle, non-contradictory. The same is true about the combination of the *together-with* construction, since Champollion is agnostic about atomic individuals as agents of *gather*-type predicates (4.46b).

(4.46)

a. ?Devochki vmeste sobralis.

girls together gathered.PL

Intended reading: ‘The girls gathered’

$$\lambda e. \text{gather}(\oplus \text{girl})(e) \wedge e \in^* \lambda e' [\text{atom}(\text{ag}(e')) \wedge \neg \text{gather}(\text{ag}(e'))(e')] \wedge e \in^* \lambda e' (\text{gather}(\text{ag}(e'))(e') \wedge |\text{agent}(e')| \leq 3)]$$

b. ?Petia vmeste s devochkami sobralis.

P.NOM together with girls.INST gathered.PL

Intended reading: ‘Peter and the girls gathered’

$$\lambda e. \text{gather}(\uparrow(P \oplus \text{girl}))(e) \wedge e \in^* \lambda e' [\text{atom}(\text{ag}(e')) \wedge \neg \text{gather}(\text{ag}(e'))(e')] \wedge e \in^* \lambda e' (\text{gather}(e') \wedge |\text{agent}(e')| \leq 3)]$$

4.6 Interim conclusion

In the previous sections, I have discuss a number of theories of collective predicates and showed that the theories of Dowty (1987), Brisson (2003) and Winter (2002) cannot account for the data involving *vmeste*. Champollion's theory makes no predictions about the combination of nominal constructions involving *vmeste* with collective predicates on its own and does not rule out the ungrammaticality in combination with the theory developed in the previous chapters.

Champollion's *gather*-type predicates include Hackl's essentially plural predicates and the predicates that Hackl lists as essentially plural predicates but points out that their binary counterparts are unclear, such as *gather*, *surround* and *crowd*. These are the predicates that speakers are often confused about in Russian (4.47). These predicates do not form a uniform group. In English, speakers are often unsure if *surround* combines with *all* at all and is a *gather*-type predicate (4.48). *Gather* and *crowd*, in turn, are often reported to be incompatible with pluralities of two (4.49). Lucas Champollion (p.c.) points that examples with *gather* predicating over a plurality of two exist, yet are rare (4.10).

(4.47)

a. ?Misha vmeste s devochkami sobralis / stolpilis / okruzhili stol.

M.NOM together with girls.INST gathered.PL / crowded.PL / surrounded.PL table

b. ?Misha i devochki vmeste sobralis / stolpilis / okruzhili stol.

M._{NOM} and girls._{NOM} together gathered._{PL} / crowded._{PL} / surrounded._{PL} table

(4.48) ?All the boys surrounded the castle.

(4.49) ?John and Mary crowded / gathered in the yard.

(4.50) For where two or three gather in my name, there am I with them. (*Matthew* 18:20)

In the following study, I explore if the sentences in (4.46) are acceptable in order to determine whether *vmeste* is sensitive to Champollion's (2017) stratified reference or to a more strict requirement, such as the covert reciprocity of the predicate (Hackl, 2002).

4.7 Experiment

This experiment aims to explore those of Champollion's *gather*-type predicates that are not Hackl's essentially plural predicates in Russian. The goals are as follows: first, to find out if these predicates are indeed *gather*-type predicates; second, to find out if these predicates combine with adnominal *together* and the *together-with* construction; and,

third, to find out if the ability to combine with adnominal *together* and the *together-with* correlates with inability to combine with *all*. These predicates include: *sobratsja* ‘gather’, and probably *okružhit* ‘surround’ and *stolpitsja* ‘crowd’

The hypotheses are as follows:

(4.51)

Hypothesis 1: *Okružhit* (‘surround’) and *stolpitsja* (‘crowd’) are *gather-type* predicates. That is, the combination of *all* with *okružhit* (‘surround’) and *stolpitsja* (‘crowd’) should be as acceptable as the combination of *okružhit* (‘surround’) and *stolpitsja* (‘crowd’) with regular plurals.

Prediction:

Vse malchiki okružhili X / *stolpilis*. is rated similar to *Malchiki okružhili* X/*stolpilis*.

All boys surrounded.PL X / *crowded*.PL *Boys* surrounded.PL X / *crowded*.PL

(4.52)

Hypothesis 2: The *together-with* construction and adnominal *vmeste* are incompatible with essentially plural predicates, e.g. *vstretitsja* (‘meet’). That is, the combination of the *together-with* construction and adnominal *together* with *vstretitsja* (‘meet’) should be less acceptable than the combination of regular plurals with *vstretitsja* (‘meet’).

Prediction:

Masha vmeste s malchikami vstretilis. < Masha i malchiki vstretilis

Maria together with boys met.PL Maria and boys met.PL

Masha i malchiki vmeste vstretilis. < Masha i malchiki vstretilis.

Maria and boys together met.PL Maria and boys met.PL

Where ‘<’ stands for ‘is rated lower than’

(4.53)

Hypothesis 3: Adnominal *vmeste* is less acceptable in combination with essentially plural predicates, i.e. *vstretitsja* (‘meet’), than in combination with *gather*-type predicates that are not essentially plural predicates, i.e. *sobratsja* (‘gather’), *okruzhit* (‘surround’) and *stolpitsja* (‘crowd’).

Prediction:

Masha i malchiki vmeste vstretilis < Masha i malchiki vmeste sobralis / okruzhili x / stolpilis.

Maria and boys together met.PL Maria and boys together gathered.PL / surrounded.PL / crowded.PL

(4.54)

Hypothesis 4: The *together-with* construction is less acceptable in combination with essentially plural predicates, i.e. *vstretitsja* (‘meet’), than in combination with *gather*-type

predicates that are not essentially plural predicates, i.e. *sobratsja* ('gather'), *okruzhit* ('surround') and *stolpitsja* ('crowd').

Prediction:

Masha vmeste s malchikami vstretilis < *Masha vmeste s malchikam sobralis* / *okrzhili* X / *stolpilis*

Maria together with boys met._{PL} *Maria together with boys gathered*._{PL} / *surrounded*._{PL} / *crowded*._{PL}

(4.55)

Hypothesis 5: The ability to combine with the *together-with* construction and adnominal *vmeste* correlates with inability to combine with *vse* 'all'.

Prediction:

If a sentence with *vse* 'all' is rated high, then a sentence with the same predicate and the *together-with* construction or adnominal *vmeste* should be rated low, and vice versa.

4.7.1 Design, materials and participants

The survey was conducted online. The materials were presented electronically as a randomized list of sentences. Participants were asked to rate each of the sentences on a scale from 1 (worst) to 5 (best). The list consisted of 55 (11NPs * 5VPs) sentences: 28 test sentences and 27 filler sentences.

The sentences were comprised of 7 test NPs of 4 different types (4.56): the *together-with* construction (2 NPs), adnominal *together* (2 NPs), plurality of more than 2 (2 NPs) and one *all*-NP; and 4 different VPs (4.57): *meet*, *gather*, *crowd* and *surround*. In addition, 4 filler NPs: the *with* construction (2 NPs) and the plurality of 2 (2 NPs) and 1 filler VP (*be a group of 2/3 people*) were used (4.57).

(4.56) Test NPs:

a. *together-with* construction

(i) Masha vmeste s malchikami

Mary together with boys

(ii) Masha vmeste s Petei i Natashei

Mary together with Peter and Natalie

b. adnominal *together*

(i) Masha i malchiki vmeste

Mary and boys together

(ii) Masha, Petia i Natasha vmeste

Mary Peter and Natalie together

d. plurality of more than two

(i) Masha i malchiki

Mary and boys

(ii) Masha, Petia i Natasha

Mary Peter and Natalie

c. *all*

vse devochki

all girls

(4.57) Test VPs:

a. *meet*:

vstretilis v sadu

met.PL in garden

b. *gather*:

sobralis v sadu

gathered.PL in garden

c. *crowd*:

stolpilis u vxoda

crowded.PL at entrance

d. *surround*:

okruzhili stol

surrounded.PL table

(4.58) Filler NPs and VPs:

a. plurality of 2:

(i) Masha i Petia

Mary and Peter

(ii) dve devochki

two girls

b. *with*-construction

(i) Masha s malchikami

Mary with boys

(ii) Masha s Petei i Natashei

Mary with Peter and Natalie

c. *be a group of X people*:

eto grupa iz 2/3 chelovek

this group of 2/3 people

As I mention above, speakers are often unsure if *gather* and *crowd* can be predicated over small pluralities of two. This question is beyond the focus of this dissertation and I do not discuss it in this study, but, in principle, this data can be extracted from the results of the experiment.

15 native speakers of Russian participated in the study (8 women and 7 men); aged between 23 and 46. All of them lived in Moscow or Saint Petersburg at the time of the study.

4.7.2 Results

The Mann-Whitney U test was run in all cases. This test is used to compare two sample means that come from the same population, and to test whether two sample means are equal or not. A p -value < 0.05 was considered significant. The results were as follows.

Hypothesis 1: There was no significant difference in acceptability between the combinations *all+surround* and *group>2+surround*, and both combinations were rated high (median 5). The same is true for the combinations *all+crowd* and *group>3+crowd* (median 5). That is, we can conclude that *okruzhit* ('surround') and *stolpitsja* ('crowd') are *gather*-type predicates, just like *sobratsja* ('gather').

(4.59)

| | median |
|------------------------------|--------|
| <i>all + surround</i> | 5 |
| <i>group>2 + surround</i> | 5 |
| <i>all + crowd</i> | 5 |
| <i>group>2 + crowd</i> | 5 |

Table 3: *Okruzhit* 'surround' and *stolpitsja* 'crowd' are *gather*-type predicates

(4.60)

| | <i>p</i> -value |
|--|-----------------|
| <i>all + surround</i> ≠ <i>group>2 + surround</i> | 0.1198 |
| <i>all + crowd</i> ≠ <i>group>2 + crowd</i> | 0.1138 |

Table 4: The Mann-Whitney U test for Hypothesis 1

Hypothesis 2. As expected, the combination of the together-with construction and adnominal *vmeste* with essentially plural *vstretitsja* (‘meet’) (median 3 in both cases) was rated significantly lower than the combination of a regular plural with essentially plural *vstretitsja* (‘meet’) (median 5).

(4.61)

| | median |
|-----------------------------|--------|
| <i>together-with + meet</i> | 3 |
| <i>together + meet</i> | 3 |
| <i>group>2 + meet</i> | 5 |

Table 5: Constructions involving *vmeste* are not compatible with *vstretitsja* ‘meet’

(4.62)

| | <i>p</i> -value |
|--|-----------------|
| <i>together-with + meet</i> < <i>group>2 + meet</i> | < 0.001 |
| <i>together + meet</i> < <i>group>2 + meet</i> | < 0.001 |

Table 6: The Mann-Whitney U test for Hypothesis 2

Hypothesis 3. The combination of adnominal *vmeste* and *okružhit* ('surround') (median 3.5) was rated significantly higher than the combination of adnominal *vmeste* and *vstretitsja* ('meet') (median 3). The same is true for the combination of adnominal *vmeste* and *sobratsja* ('gather') (median 4) and for the combination of adnominal *vmeste* and *stolpitsja* ('crowd') (median 4). However, none of this combination was rated as fully acceptable (median < 5).

(4.63)

| | median |
|----------------------------|--------|
| <i>together + surround</i> | 3.5 |
| <i>together + gather</i> | 4 |
| <i>together + crowd</i> | 4 |
| <i>together + meet</i> | 3 |

Table 7: Adnominal *vmeste* is not compatible with gather-type predicates

(4.64)

| | p-value |
|---|-----------|
| <i>together + surround</i> > <i>together + meet</i> | 0.001928 |
| <i>together + gather</i> > <i>together + meet</i> | <0.001 |
| <i>together + crowd</i> > <i>together + meet</i> | 0.0006944 |

Table 8: The Mann-Whitney U test for Hypothesis 3

Hypothesis 4 was not confirmed. The combination of the *together-with* construction and *okružhit* ('surround') / *stolpitsja* ('crowd') / *sobratsja* ('gather') was not rated

significantly higher than the combination of the *together-with* construction and *vstretitsja* ('meet').

(4.65)

| | median |
|--|--------|
| <i>together-with</i> + <i>surround</i> | 4 |
| <i>together-with</i> + <i>gather</i> | 3 |
| <i>together-with</i> + <i>crowd</i> | 4 |
| <i>together-with</i> + <i>meet</i> | 3 |

Table 9: The *together-with* construction is not compatible with *gather*-type predicates

(4.66)

| | <i>p</i> -value |
|---|-----------------|
| <i>together-with</i> + <i>surround</i> > <i>together-with</i> + <i>meet</i> | 0.3026 |
| <i>together-with</i> + <i>gather</i> > <i>together-with</i> + <i>meet</i> | 0.6859 |
| <i>together-with</i> + <i>crowd</i> > <i>together-with</i> + <i>meet</i> | 0.2145 |

Table 10: The Mann-Whitney U test for Hypothesis 4

Hypothesis 5 was not confirmed. This hypothesis seems to not hold at least for *stopitsja* ('crowd'): while speakers judge it as compatible with *all* (median 5), they also rate it relatively high in combination with adnominal *vmeste/together* (median 4).

4.7.3 Discussion

The experiment shows that *okruzhit* ('surround') and *stolpitsja* ('crowd') are *gather*-type predicates along with *sobratsja* ('gather'). The combination of these predicates with adnominal *vmeste* is rated higher than the combination of *vstretitsja* ('meet') with adnominal *vmeste*, which indicates that the construction is sensitive to the covert reciprocity of the predicate. However, the combination of these predicates with adnominal *vmeste* was not fully accepted (median 3.5-4), which indicates that there are other factors affecting the acceptability of the combination of adnominal *vmeste* with a predicate. I leave this issue for further research.

The *together-with* construction turned out to be incompatible with all *gather*-type predicates. Since, according to my theory, the *together-with* construction is an impure atom, it is possible that, *gather*-type predicates are not compatible with impure atoms. Finally, the ability of the predicate to combine with *all* does not imply its inability to combine with adnominal *vmeste*, *stolpitsja* ('crowd') being at least one counterexample.

4.8 Overall conclusion

In this chapter, I discussed the interaction of adnominal *vmeste* and the *together-with* construction with collective predicates. I showed that the insights of the previous

chapters that claim that adnominal *vmeste/ together* is sensitive to the covert reciprocity of the predicate might be correct.

I discussed a number of theories of collective predicates and identified Hackl (2002) and Champollion (2017) as two theories potentially capable of explaining why certain collective predicates are incompatible with nominal constructions involving *vmeste* in Russian. In an experiment, I found evidence for the claim that adnominal adnominal *vmeste* is incompatible with the covert reciprocity of the predicate, supporting Hackl's theory.

There is a number of questions left open about collective predicates, specifically about the predicates that are *gather*-type predicates but not essentially plural predicates, such as *sobratsja* ('gather'), *stolpitsja* ('crowd'), or *okruzhit* ('surround'). Their inability to combine with the *together-with* construction and the fact that they are judged as not fully acceptable with adnominal *vmeste* still remains to be explained.

CHAPTER V: CONCLUSION

5.1 Summary

In this dissertation, I have examined the various ways in which a noun phrase can be interpreted collectively. I have explored two comitative constructions in Russian that do not exist in English, the *with*-construction and the *together-with* construction, as well as a construction involving adnominal *vmeste* 'together'. All these constructions are usually interpreted collectively. I have argued that their collective interpretation is derived via three different mechanisms.

In Chapter II, I have discussed two comitative constructions found in Russian: the *with*-construction and the *together-with* construction. The *with*-construction has been discussed in the literature before, while the *together-with* construction is new to the scholarly discussion.

The *with*-construction has been the subject of a debate started by McNally (1993) and Dalrymple et al. (1998a). This debate focuses on whether this construction should be

analyzed as a sum (Dalrymple et al., 1998a) or as a group (McNally, 1993). In this dissertation, I have proposed an account of the *with*-construction that, ultimately, follows the intuition of Dalrymple et al. I have also claimed that it is the *together-with* construction that should be analyzed as a group, similarly to McNally's account of the *with*-construction.

I have proposed that the *with*-construction is a case of reciprocal conjunction and should be analyzed similar to relational-noun coordination, e.g. *muzh i zhena* ('husband and wife'). I have claimed that the *with*-construction denotes a set of sums where the members of each sum are related via relations R_1 and R_2 that are either supplied by the context, in the case of proper names and non-relational nouns, or are the part of the noun meaning, in the case of relational nouns.

My account explains the "relatedness" intuition speakers have: they report that the *with*-construction is best used when the members of the construction are "somehow related". While Dalrymple et al. claim that the difference between ordinary *and*-coordination and the *with*-construction is only pragmatic, I have proposed that the *with*-construction is derived via a more complex mechanism or reciprocal conjunction and is, essentially, a case of relational-noun coordination. This approach explains the presence of the Relatedness Requirement.

I have proposed that the prominence of the collective interpretation of the *with*-construction is the result of using the collective strategy to meet the Relatedness

Requirement. This strategy, however, does not need to apply, as other strategies, (spatiotemporal, relational or contrastive) can apply, allowing for the sentence to be interpreted distributively.

I have introduced the *together-with* construction. Similarly to the *with*-construction, the *together-with* construction forms a constituent, tends to be interpreted collectively, yet allows for a distributive interpretation. In contrast to the *with*-construction, the *together-with* construction is incompatible with reciprocal predicates.

The incompatibility of the *together-with* construction with reciprocal predicates suggests that this construction should be analyzed similarly to group terms, i.e. *team*, that are also incompatible with reciprocal predicates in Russian. Further evidence shows that the *together-with* construction can only be the subject of P-distributivity, but not Q-distributivity, similarly to group terms. I have concluded that the *together-with* construction should be analyzed as identical to group terms and proposed that it denotes an impure atom. I have proposed that comitative *vmeste* 'together' in the *together-with* construction is a group forming operator. I have explained the incompatibility of the *together-with* construction with reciprocal predicates by claiming that reciprocal predicates cannot have atomic arguments in their denotation.

In Chapter III, I have analyzed the adnominal use of *vmeste* 'together'. I have reviewed the current theories of *together* and identified a number of problems that neither of these theories can explain at once.

The problems are as follows. First, adnominal *vmeste* has no spatiotemporal proximity reading, in contrast to adverbial *vmeste*. Second, adnominal *vmeste* has no group credit interpretation. Finally, it is not compatible with distributive predicates like *ulybnutsja* ('smile') or reciprocal predicates like *uvidet drug druga* ('see each other').

I have proposed a new event-based approach for the meaning of adnominal *vmeste*. In a way, it is a simplification of Lasersohn (1990) — my adnominal *vmeste* explicitly blocks group-credit readings, and the incompatibility of adnominal *vmeste* with distributive and reciprocal predicates is achieved as a consequence of that.

In chapter IV, I have discussed the interaction of adnominal *vmeste* and the *together-with* construction with collective predicates. I have reviewed a number of theories of collective predicates and identified Hackl (2002) and Champollion (2017) as two theories potentially capable of explaining why certain collective predicates are incompatible with nominal constructions involving *vmeste* in Russian. In an experiment, I have found evidence suggesting that adnominal *vmeste* is sensitive to the covert reciprocity of the predicate, consistent with Hackl's theory.

5.2 Formal fragment

This section summarizes the fragment developed in my dissertation. It starts with the analysis of the *with*-construction. I claim that this construction should be analyzed

as a case of reciprocal conjunction. To derive the meaning of the construction, I use Staroverov's approach (2007), combined with of Barker's theory of possessives (2011). I use the type shifters listed below.

(5.1) Type shifters:

$$a. \pi = \lambda P_{et} \lambda x_e \lambda y_e. P(y) \wedge R(x, y) \quad (\text{Barker, 2011})$$

$$b. \text{inv} = \lambda Y_{<e, et>} \lambda u_e \lambda v_e. Y(v, u) \quad (\text{Staroverov, 2007})$$

$$c. \text{coll} = \lambda R_{<e, et>} \lambda Z_e \exists x_e \exists y_e. Z = x \oplus y \wedge R(x, y) \quad (\text{Staroverov, 2007})$$

$$d. \sqcap = \lambda P_{\sigma t} \lambda Q_{\sigma t}. P \cap Q \quad (\text{Winter, 2001})$$

$$e. \text{ident} = \lambda x_e \lambda y_e. y = x \quad (\text{Partee, 1986})$$

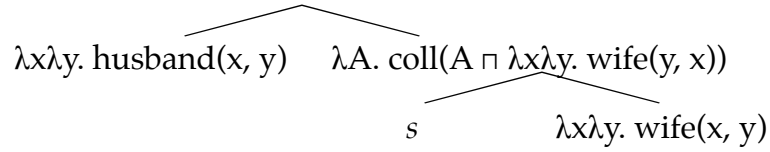
$$f. \iota = \lambda P_{et}: |P| = 1. \text{ the unique } x \text{ such that } P(x) \quad (\text{Partee, 1986})$$

The meaning of the comitative *s* ('with') is in (5.2a). The examples of relational-noun (*muzh s zhenoj* 'husband with wife'), proper-noun (*Misha s Petej* 'Mike with Peter') and regular-noun (*xudozhnik s poetom* 'artist with poet') coordination are in (5.2b-d).

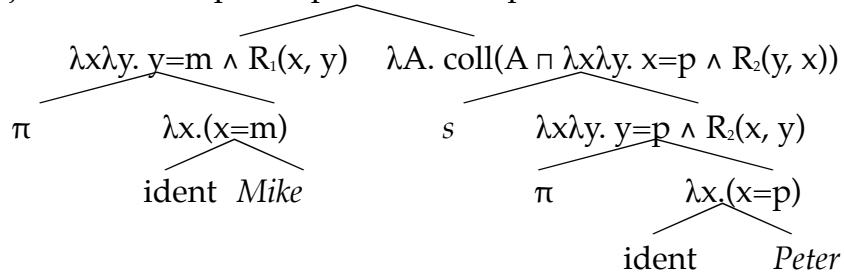
(5.2)

$$a. \llbracket s \rrbracket = \lambda A_{\langle e, et \rangle} \lambda B_{\langle e, et \rangle}. \text{coll}(B \sqcap \text{inv}(A)) \quad \langle \langle e, et \rangle, \langle \langle e, et \rangle, et \rangle \rangle$$

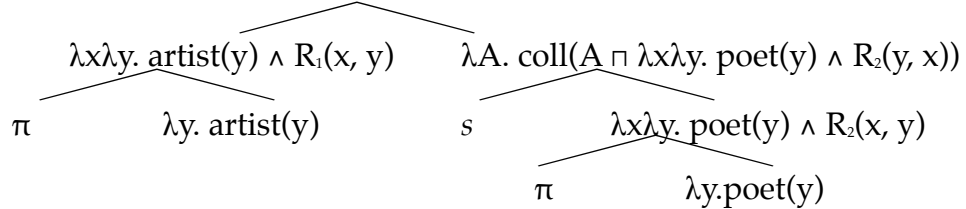
$$b. \llbracket \text{muzh s zhenoj} \rrbracket = \lambda X \exists x \exists y. X = x \oplus y \wedge \text{husband}(x, y) \wedge \text{wife}(y, x)$$



$$c. \llbracket \text{Misha s Petej} \rrbracket = \lambda X. X = m \oplus p \wedge R_1(p, m) \wedge R_2(m, p)$$



$$d. \llbracket \text{xudozhnik s poetom} \rrbracket = \lambda X \exists x \exists y. X = x \oplus y \wedge \text{poet}(y) \wedge R_1(x, y) \wedge \text{artist}(x) \wedge R_2(y, x)$$



The derivation in (5.2) requires that the members of the *with*-construction participate in relations R_1 and R_2 supplied by the context. I call this requirement the Relatedness Requirement. This requirement can be met by a number of strategies: relational strategy, spatiotemporal strategy, collective strategy or contrastive strategy. The collective strategy is shown in (5.3), the relational strategy in (5.4), and the spatiotemporal

strategy in (5.5). Only the application of the collective strategy requires the sentence to be interpreted collectively. All other strategies allow for both interpretations.

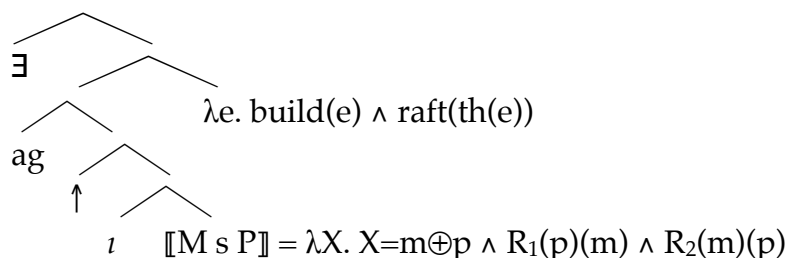
(5.3) Collective strategy

a. Masha s Petej postroili plot.

M._{NOM} with P._{INS} built._{PL} raft

‘Mary and Peter built a raft (together)’

b. $\exists e. \text{build}(e) \wedge \text{raft}(\text{th}(e)) \wedge \text{ag}(e) = \uparrow[\iota X. X = m \oplus p \wedge R_1(p)(m) \wedge R_2(m)(p)]$



c. Relatedness Requirement: $R_1 = R_2 = \lambda x \lambda y. \exists e. \text{ag}(e) = \uparrow(x \oplus y)$

in terms of relational nouns: $R_1 = R_2 = \lambda x \lambda y. \text{colleague}(x)(y)$

(5.4) Relational strategy

Context: Mary is Peter’s daughter.

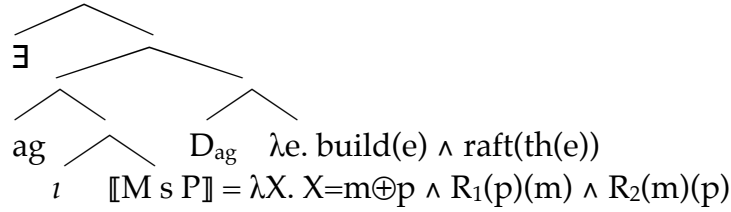
a. Masha s Petej postroili plot.

M._{NOM} with P._{INS} built._{PL} raft

b. $\exists e_1, e_2. \text{build}(e_1) \wedge \text{build}(e_2) \wedge \text{raft}(\text{th}(e_1)) \wedge \text{raft}(\text{th}(e_2)) \wedge \text{ag}(e_1)=m \wedge \text{ag}(e_2)=p \wedge$

$R_1(p)(m) \wedge R_2(m)(p)]$

distributive



c. $\exists e. \text{build}(e) \wedge \text{raft}(\text{th}(e)) \wedge \text{ag}(e) = \uparrow[\iota X. X=m\oplus p \wedge R_1(p)(m) \wedge R_2(m)(p)]$

collective

d. Relatedness Requirement: $R_1 = \lambda x \lambda y. \text{daughter}(x)(y)$; $R_2 = \lambda x \lambda y. \text{father}(x)(y)$

(5.5) Spatiotemporal strategy:

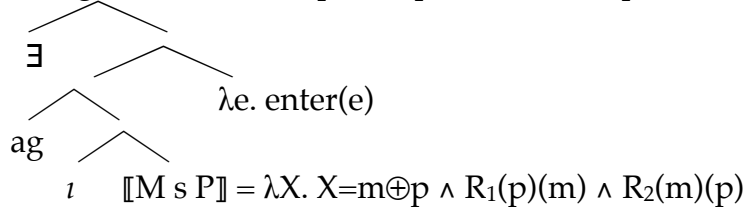
a. Masha s Petej voshli v klass.

M._{NOM} with P._{INS} entered._{PL} in classroom

‘Mike and Peter entered the classroom (together)’

b. $\exists e. \text{enter}(e) \wedge \text{ag}(e) = [\iota X. X=m\oplus p \wedge R_1(p)(m) \wedge R_2(m)(p)] = (2.37d)$

distributive



c. Meaning postulate: *vojti* ‘enter’ is distributive on its agent position

$\forall e [\text{enter}(e) \rightarrow e \in * \lambda e' (\text{enter}(e') \wedge \text{atom}(\text{ag}(e')))]$

$$d. \exists e_1, e_2. \text{enter}(e_1) \wedge \text{enter}(e_2) \wedge \text{ag}(e_1) = m \wedge \text{ag}(e_2) = p \wedge R_1(p)(m) \wedge R_2(m)(p)$$

$$e. \text{Relatedness Requirement: } R_1 = R_2 = \lambda x \lambda y \exists e_1, e_2. \text{ag}(e_1)=x \wedge \text{ag}(e_2)=y \wedge \tau(e_1)=\tau(e_2)$$

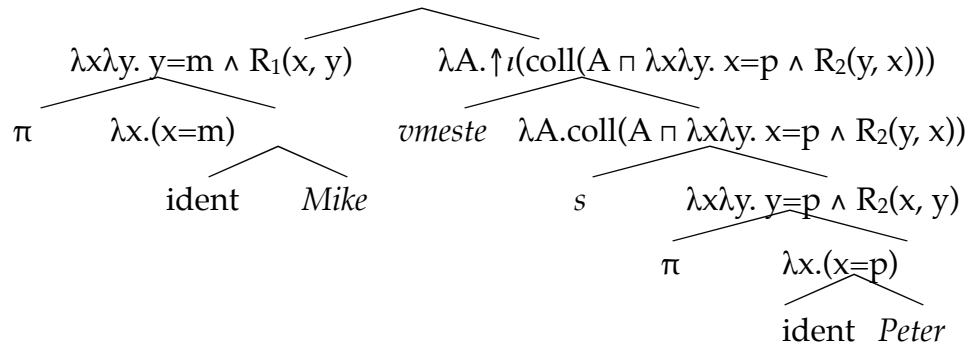
in terms of relational nouns: $R_1 = R_2 = \lambda x \lambda y. \text{companion}(x)(y)$

Moving on to the *together-with* construction, I claim that its meaning involves group formation (5.5).

(5.5)

$$a. \llbracket \text{vmeste}_{\text{COMITATIVE}} \rrbracket = \lambda A_{\langle \langle e, et \rangle, et \rangle} \lambda B_{\langle e, et \rangle}. \uparrow \iota A(B)$$

$$b. \llbracket \text{Misha vmeste s Petej} \rrbracket = \uparrow \iota (\text{coll}(\lambda x \lambda y. y=m \wedge R_1(x, y) \wedge x=p \wedge R_2(y, x))) = \uparrow (m \oplus p)$$



The distributive interpretation of the *together-with* construction is achieved through meaning postulates (5.6).

(5.6) *distributive*

a. Misha vmeste s Petej ulybnulis.

together-with

Mike together with Peter smiled

‘Mike and Peter smiled together.’

b. Komanda ulybnulas.

group

team smiled

‘The team smiled.’

c. **Meaning postulate:** $\text{smile}(\uparrow X) \Rightarrow \forall x \leq X [\text{atom}(x) \rightarrow \text{smile}(x)]$

The lexical entry of adnominal *vmeste* is in (5.7). It disallows the group credit interpretation (5.8) and the distributive interpretation of the *together*-NP, and makes *together*-NPs incompatible with reciprocal predicates (5.10).

(5.7)

$\llbracket \text{vmeste}_{\text{ADNOMINAL}} \rrbracket = \lambda x \lambda P \lambda e. P(e) \wedge \text{ag}(e)=x \wedge e \in {}^* \lambda e' (\text{atom}(\text{ag}(e')) \wedge \neg P(e'))$

(5.8)

a. Context: At a potluck party, Peter and Maria are a couple.

Petia i Masha vmeste ispekli pirog.

Peter and Maria together baked pie

Peter and Maria together baked a pie.

Both Peter and Maria are required to contribute, FALSE if it is Maria who baked a pie.

b.

$\lambda e. \text{bake}(e) \wedge \text{ag}(e)=p \oplus m \wedge \text{pie}(\text{th}(e)) \wedge \exists e_1, e_2: e=e_1 \oplus e_2 \wedge \text{ag}(e_1)=p \wedge \text{ag}(e_2)=m \wedge$
 $\neg(\text{bake}(e_1) \wedge \text{pie}(\text{th}(e_1))) \wedge \neg(\text{bake}(e_2) \wedge \text{pie}(\text{th}(e_2)))$

(5.9)

a. *Petia i Masha vmeste ulybnulis.

P._{NOM} and M._{NOM} together smiled._{PL}

b. *vmeste* requirement:

$\lambda e. \text{smile}(e) \wedge \text{ag}(e)=p \oplus m \wedge \exists e_1, e_2: [e=e_1 \oplus e_2 \wedge \text{ag}(e_1)=p \wedge \text{ag}(e_2)=m \wedge \neg \text{smile}(e_1) \wedge$
 $\neg \text{smile}(m)(e_2)]$

c. Distributivity requirement:

$$\lambda e. \text{smile}(e) \wedge \text{ag}(e)=p \oplus m \wedge \exists e_1', e_2': [e=e_1' \oplus e_2' \wedge \text{smile}(e_1') \wedge \text{smile}(e_2') \wedge \text{ag}(e_1')=p \wedge \text{ag}(e_2')=m]$$

(5.10)

a. *Petia i Masha vmeste uvideli drug druga.

Peter and Maria together saw.PL each other

b. $\lambda e. \text{see-eo}(e) \wedge \text{ag}(e)=p \oplus m \wedge \exists e_1, e_2: e=e_1 \oplus e_2 \wedge \text{ag}(e_1)=p \wedge \text{ag}(e_2)=m \wedge$
 $\neg \text{see-eo}(e_1) \wedge \neg \text{see-eo}(e_2)$

5.3 Future work

5.3.1 Moving to the verbal domain, expanding and unifying

In this dissertation, I have addressed nominal comitative constructions and various nominal uses of *together* / *vmeste*, and I have left a number of constructions aside. These constructions include various comitative VP-adjuncts: *with*-PPs (5.11a) and *together-with* PPs (5.11b), and adverbial *vmeste* ‘together’ (5.12).

(5.11)

a. *with*-PP

Masha prishla na vecherinku s Petej.

M._{NOM} came._{SG} to party with P._{INST}

‘Maria came to the party with Peter’

b. *together-with* PP

Masha prishla na vecherinku vmeste s Petej.

M._{NOM} came._{SG} to party together with P._{INST}

‘Maria came to the party together with Peter’

(5.12) Adverbial *vmeste*:

Malchiki prishli na vecherinku vmeste.

Boys came._{PL} to party together

‘The boys came to the party together’

The sentences in (5.11) and (5.12) suggest that each of the nominal constructions discussed in this dissertation might have a corresponding construction in the verbal domain. They indeed have many similarities. Similarly to the *with*-construction and the *together-with* construction, VP-adjuncts and adverbial *vmeste* can trigger collective

interpretations or indicate spatiotemporal proximity of the events in question, both in English and in Russian.

(5.13) Adverbial *vmeste*

a. Petia i Masha podniali pianino vmeste. *collective*

P._{NOM} and M._{NOM} lifted.PL piano together

‘Peter and Mary lifted a piano together’

b. Petia i Masha sideli vmeste *spatial proximity*

P._{NOM} and M._{NOM} sat.PL together

‘Peter and Mary sat together’

c. Petia i Masha vstali vmeste. *temporal proximity*

P._{NOM} and M._{NOM} stood-up.PL together

‘Peter and Mary stood up together’

(5.14) *With*-adjunct

a. Petia podnial pianino s Mashej. *collective*

P._{NOM} lifted.PL piano with M._{INST}

‘Peter lifted a piano with Mary’

b. Petia sel s Mashej. *spatial proximity*

P._{NOM} sat.PL with M._{INST}

‘Peter sat with Mary’

c. Petia vstal s Mashej. *temporal proximity*

P._{NOM} stood-up._{SG} with M._{INST}

‘Peter stood up with Mary’

(5.15) *Together-with* adjunct

a. Petia podnial pianino vmeste s Mashej. *collective*

P._{NOM} lifted.PL piano together with M._{INST}

‘Peter lifted a piano together with Mary’

b. Petia sel vmeste s Mashej. *spatial proximity*

P._{NOM} sat.PL together with M. _{INST}

‘Peter sat together with Mary’

c. Petia vstal vmeste s Mashej. *temporal proximity*

P._{NOM} stood-up._{SG} together with M._{INST}

Peter stood up together with Mary.

The predicate compatibility patterns are, however, somewhat different. Adverbial *vmeste* allows for distributive predicates, whereas adnominal *vmeste* does not (5.16b). *Vmeste* is not able to modify reciprocal predicates in any position (5.17). Interestingly, however, (5.18) can mean ‘Each of the boys pictured himself and other boys together (as a group)’. I presume this shows that transitive *uvidet* (‘see’) is reciprocated with modifying *vmeste* ‘together’: [boys [saw together] each other].

(5.16) *adnominal*

a. ??Malchiki vmeste ulybnulis.

Boys together smiled.PL

adverbial

b. Malchiki ulybnulis vmeste.

Boys smiled.PL together

(5.17)

a. *Malchiki vmeste podderzhali drug druga.

boys together supported.PL each other

adnominal

b. *Malchiki podderzhali drug druga vmeste.

boys supported.PL each other together

adverbial

(5.18)

Malchiki uvideli drug druga vmeste. *adverbial*

Boys saw.PL each other together

‘Each of the boys pictured himself and other boys together (as a group)’

Comitative adjuncts do not seem to be able to modify a reciprocal predicate:

(5.19)

a. *Malchiki podderzhali drug druga s Mashej. *with-adjunct*

Boys supported.PL each other with M.INST

b. *Malchiki podderzhali drug druga vmeste s Mashej. *together-with adjunct*

Boys supported.PL each other together with M.INST

The data does not offer a straightforward suggestion on how to expand the analysis developed for the nominal constructions to the verbal domain. As to the *with*-construction, Ionin & Matushansky (2003) propose a unified syntactic account of *with*-adjuncts and the *with*-construction, but it is not clear if the same approach can be expanded to other constructions.

5.3.2 The mystery of collective predicates

The experiment reported in Chapter IV raised a number of questions that remain open. While it suggested that adnominal *vmeste* is sensitive to the covert reciprocity of the predicate, those *gather*-type predicates that are not covertly reciprocal (*sobratsja* 'gather', *okružhit* 'surround' and *stolpitsja* 'crowd') are still not fully compatible with adnominal *vmeste* (median 3.5-4). This gradual effect still remains to be explained.

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