FACULTAD DE FILOLOGÍA
filologia.us.es

REGISTRO DE ENTRADA

MÁSTER UNIVERSITARIO

EN ESTUDIOS LINGÜÍSTICOS, LITERARIOS Y CULTURALES
(título del Máster)

TÍTULO: DITRANSITIVE VERBS AND QUANTIFIER SCOPE AMBIGUITY:
(del trabajo) WHAT DOES SENTENCE PROCESSING TELL US ABOUT THE NATURE OF ALTERNATING VERBS?

DECLARACIÓN DE ORIGINALIDAD (*NRTFE: Art. 8.1*):

El/la estudiante D./Dña. Ekaterina Mazalova con [redacted] DECLARA

(1) que el presente Trabajo de Fin de Máster es original e inédito y está libre de plagios;
(2) que ha citado adecuadamente los textos y ejemplos tomados de otros autores;
(3) que es consciente de las consecuencias académicas y/o disciplinarias derivadas del incumplimiento de las declaraciones (1) y (2), en aplicación de las normas vigentes de la Universidad de Sevilla.

Firmado:
(solicitante) _____ _____

DECLARACIÓN DE CONFORMIDAD:

El profesor/a D./Dña. Ángel Luis Jiménez-Fernández, tutor/a del estudiante autor/a de este TFM,

EXPRESA su conformidad con el contenido y la forma del presente Trabajo de Fin de Máster y autoriza los trámites administrativos para su depósito.
EXPRESA no ser consciente ni responsable de posibles plagios ni del uso indebido de textos o ideas de otros autores.

Firmado: _____
(tutor /a)

ABSTRACT

Ditransitive alternating verbs are a class of verbs which can take two objects as their arguments and cause an alternation of the two syntactic frames (e.g., *He sprayed paint onto the wall/He sprayed the wall with paint*). These constructions pose challenges with respect to their analysis: whether the two patterns involved in the alternation are derived from the same underlying structure or not. The main objective of this research is to shed light upon the structural composition of locative alternation through the phenomenon of quantifier scope ambiguity. To achieve this aim, we analyse the principles that account for the disambiguation of scopally ambiguous sentences and surface processing of scopally frozen sentences. While seeking to provide empirical evidence, we conduct an experimental study, in which we test the way L1 English speakers and L1 Russian speakers process both ambiguous and unambiguous sentences. The results obtained in the course of the experiment showed that English and Russian native speakers give preference to both surface and inverse readings for ambiguous sentences and surface reading only for unambiguous sentences. Moreover, a more thorough analysis of the obtained data indicated that for ambiguous sentences the mean score for the surface interpretation preference was higher when compared to inverse interpretation in both Russian and English. These findings led us to conclude that in both English and Russian the two alternating frames in locative alternation should be analysed derivationally and perceived as sharing the same underlying structure. Yet, certain deviating results and the limitations involved in the study urge us to suggest the necessity for future research, involving a broader range of tested verbs, a higher number of informants and expanding the study to other languages.

Keywords: double object constructions, quantifier scope ambiguity, scope-freezing, Locative alternation

ACKNOWLEDGMENTS

My deepest gratitude to my thesis supervisor, Dr. Ángel Luis Jiménez-Fernández. Thank you for introducing me to the beautiful and complex phenomenon of quantifier scope ambiguity and for guiding me throughout my research. I am grateful for your patience, kindness and your time. It was a privilege to work together with you and broaden my academic and personal knowledge.

I also wish to thank my dear friends for encouraging me and staying by my side. To Leo and Giulia – thank you for being my veritable intellectual comrades and true kindred spirits. My eternal gratitude goes to Yurii and Sonia for not letting me doubt the rightness of my choice and encouraging me to pursue this master's degree despite all the fears and doubts.

Finally, I want to thank my mother, Tatiana, for giving me unconditional love and support even while being thousands of miles away from me. Thank you for making my dream come true and teaching me with your own example how hard work and perseverance can make miracles happen.

Contents

1. Introduction 5

2. Ditransitives and Scope: State of the Art 7

2.1. The Treatment of Double Object Constructions: Derivational or Non-derivational Analysis? 7

2.2. Quantifier Scope: Theoretical Approaches and Research Challenges 11

2.3. Quantifier Scope Ambiguities in Double Object Constructions in English 16

2.4. Quantifier Scope Ambiguities in Double Object Constructions in Russian 18

2.5. Quantifier Scope Ambiguity Resolution Principles 20

3. Exploring Quantifier Scope Ambiguity Resolution in Locative Double Object Constructions in English and Russian 31

3.1. Participants 31

3.2. *Methodology* 32

3.3. Materials & Procedure 35

3.4. Data Collection and Analysis 35

3.5. Results 36

3.6. Discussion 43

4. Conclusions 46

5. List of References 49

Appendix 1. Questionnaire for native L1 English-speaking respondents 53

Appendix 2. Questionnaire for native L1 Russian-speaking respondents 60

1. Introduction

The present study focuses on the exploration of structural composition of double object constructions with ditransitive locative verbs through the phenomenon of quantifier scope ambiguity. The complexity and cross-linguistic variability of double object constructions involves a great deal of challenges for their analysis. In this research, we will pay specific attention to the two of them: the first one deals with the underlying structure of these constructions and the debate as to whether one of the alternants is derived from a basic construction or not. The second question consists in examining the phenomenon of scopal ambiguity produced by the interaction of quantifiers contained within object NPs and the impact it may have on the analysis of alternating constructions cross-linguistically.

Hence, the purpose of this study is to provide empirical evidence for the derivational analysis of alternating frames in locative verbal alternation in English and Russian. To achieve this objective, we are going to conduct an empirical study exploring the processing of scopally ambiguous and scopally frozen sentences with quantified object NPs. Besides, this paper seeks to determine the principles that can predict the interpretation preferences by native speakers in scopally ambiguous sentences, and, thus, gain a better understanding of the usage and structural nature of double object constructions. The data that we have used for the analysis of how native speakers process alternating constructions in locative alternation in English and Russian were collected through online surveys distributed among monolingual speakers of English and Russian (L1 speakers of English and L1 speakers of Russian).

The established research goals lead us to formulate the following hypotheses:

Our first research question deals with exploring the way L1 English and L1 Russian speakers process scopally ambiguous and scopally frozen sentences in both of these languages. Our hypothesis is that for scopally ambiguous sentences the speakers will perceive both the surface and the inverse scope interpretations and therefore exhibit no reading preferences, whereas for unambiguous sentences, only the surface interpretation will be favoured. Therefore, these preferences will support the derivational view of the alternating frames in English and in Russian.

Our second research question addresses the issue of whether semantically identical ditransitive verbs belonging to the same verb class will be processed in the same way by L1 English and L1 Russian speakers in either of these languages. Consequently, we hypothesise that for both languages the speakers will display the same processing patterns.

Our third research question aims to establish whether the scopal behaviour of existential and universal quantifiers will be similar in both English and Russian locative alternation. Hence, our third hypothesis claims that in the two languages both existential and universal quantifiers will be subjected to the same scopal possibilities and will obey the same quantifier raising constraints.

Our fourth and final research question aims to explore what quantifier ambiguity resolution principles can predict the interpretation preferred by native speakers in both Russian and English. Thus, our hypothesis establishes that most of the principles will favour the surface interpretation of a scopally ambiguous sentence, as, on the one hand, being easier to process and, on the other hand, conforming with the majority of the existing ambiguity resolution principles.

This paper is organised as follows: in section 2, we discuss the theoretical proposals with regard to double object constructions, taking into account the derivational and non-derivational approaches to analysing the alternating constructions. Moreover, in this section, we deal with the phenomenon of quantifier scope ambiguity in relation to prepositional and double object constructions and the associated constraints in both English and Russian. In the final part of this section, we explore the existing quantifier scope ambiguity resolution principles and discuss the phenomenon of scope freezing. The consideration of all these principles presents important implications for a proper understanding of argument structure in locative alternation and the explanation as to how ditransitive verbs work in English and Russian. Afterwards, in section 3, we develop the empirical research. Therefore, in this section, we describe the participants who took part in the study and the provided data for the research to be conducted. Apart from that, we include a thorough explanation of the methodology applied to the data selection and the design of questionnaires which were distributed to the participants of the experiment. The inclusion of this information helps to ensure a better account of the section where we present the results of the conducted study. In addition, in this section we discuss the similarities and differences found among the data for both of the studied languages and relate them to the theoretical background previously expounded. The analysis of the results allows us to infer whether the initial hypotheses proved to be valid and vice versa. After that, in section 4, we offer the conclusions that we have reached throughout this study along with some implications for future research. Eventually, in section 5, we provide a list of the resources used in order to carry out the present study.

2. Ditransitives and Scope: State of the Art

In this chapter, we will provide theoretical framework for how the principles of processing scopally ambiguous and unambiguous sentences containing quantifiers within object arguments of ditransitive verbs can serve as evidence for the derivational and non-derivational analysis of verbal alternants in locative alternation in English and Russian. In the first section, we will talk about double object constructions and the challenges that they present as to the analysis of their underlying structure. In the second section, we will explore the phenomenon of quantifier scope and the factors that trigger quantifier scope ambiguity. In sections three and four, we will analyse quantifier scope ambiguity in double object constructions and prepositional object constructions in English and Russian and pay specific attention to the locative alternation. In section five, we will explore the syntactic, semantic and pragmatic principles that account for the resolution of scopally ambiguous constructions and the interpretation which will be preferred by the speaker. Finally, we will talk about scope-freezing and examine how this disambiguating syntactic phenomenon accounts for the analysis of verbal alternations in English and Russian together with the rest of the ambiguity resolution principles.

2.1. The Treatment of Double Object Constructions: Derivational or Non-derivational Analysis?

In natural languages, some verbs are referred to as ditransitive verbs, as they may take more than one Noun Phrase (NP) as their objects. In combination with the NPs, these verbs form the Double Object Constructions (DOCs). DOCs can be defined as the constructions in which two arguments of a verb appear as two NPs following it, and are traditionally referred to as the Indirect Object (IO) and the Direct Object (DO) (Verspoor, 1994, p.1). The DOCs are paired with prepositional object constructions, and both exhibit very small differences as to their semantic component:

(1) a. *Ronald gave his sister a frog.* (double object construction)

b. *Ronald gave a frog to his sister.* (prepositional dative construction)

(Bruening, 2014, p.1)

The change in the syntactic expression of the arguments in relation to the ditransitive verb as demonstrated in (1) is referred to as a verbal alternation.

The analysis of the structural composition of verbal alternating constructions has been the object of research for many syntacticians (Chomsky 1975, Kayne 1984, Barss & Lasnik 1986, Larson 1988, Aoun & Li 1989). One of the crucial problems in the analysis of the DOCs and the prepositional object constructions deals with the question of whether the two alternating frames are derived from the same underlying structure or no.

There exist two perspectives on the issue: on the one hand, the supporters of the non-derivational approach to verbal alternations motivate this analysis by the small yet existing semantic differences between the two constructions. In (2a) in the DOC the first object functions with the role of a possessor or a recipient, whereas in (2b) in the prepositional construction this object moves to the end of the sentence and takes the semantic end of motion interpretation:

(2) a. *I kicked (her/*the goal line) the ball*. (recipient or possessor)
b. *I kicked the ball to (her/the goal line).* (endpoint of motion)

(Bruening, 2014, p.1)

Another argument supporting the view of verbal alternations as non-derived is related to the fact that some ditransitive verbs are non-alternating:

(3) a. *The boss denied George his pay. (the DOC)*
b. **The boss denied his pay to George. (prepositional object construction)*

(Bruening, 2014, p.1)

Yet, an opposing view favours the derivational analysis, supporting the idea that the non-canonical pattern (the prepositional object construction) is derived from the basic one (the DOC). For instance, in Bruening (2014) examples from Bresnan and Nikitina (2009) are given, which demonstrate that the alternation corresponding to (3b) is actually acceptable:

(4) *Who could deny something to someone so dedicated to the causes of international friendship and collaboration?*

Another argument, which would support the derivational analysis is related to information structure factors, and broad focus specifically. As illustrated in Jiménez-Fernández (2023), for English Dative Alternation in a broad focus condition the speakers give preference to a specific prepositional object pattern:

(5) A: *What happened?*
B: a. *#John gave Mary the book.*
b. *John gave the book to Mary.*
B: a. *#John sent Peter the new regulation.*
b. *John sent the new regulation to Peter.*

(Jiménez-Fernández, 2023, p.14)

From this example, we conclude that in English Dative Shift one of the patterns in the alternations is derived from another[1].

[1] In fact, there are two perspectives on the analysis of derivations involved in English Dative Shift: the one which supports the DOCs as being derived from prepositional object construction (Barss and Lasnik 1986, Chomsky 1981, Jackendoff 1990, Larson 1988), and the one in which prepositional dative constructions are seen as derived from the DOCs (for more, see Aoun and Li 1989, Dryer 1986, Koizumi 1994). Recent experimental studies, as the one by Sánchez-Calderón and Fernández-Fuertes (2018) favour the DOCs as the source of derivation for

For languages such as Spanish, however, native speakers exhibit no specific preference for either of the two available patterns in a broad focus condition, which is illustrated below on the example of Spanish locative alternation:

(6) A: *¿Qué pasó?*
'What happened?'
B: *Juan cargó la leña en el carro.*
'Juan loaded the wood on the truck.'
B: *Juan cargó el carro con la leña.*
'Juan loaded the truck with the wood.'

(Jiménez-Fernández, 2023, p.15)

As long as both of the answers are accepted as basic or canonical patterns, in Spanish locative alternation broad focus gives evidence for a non-derivational analysis of the alternating constructions.

It should be stated, however, that the behaviour of verbal alternations varies cross-linguistically and while in Spanish the alternants may have separate lexical entries, and require a non-derivational analysis, in English or Russian (as will be discussed later in this paper) the verbs in the alternation belonging to the same case are derivationally connected. In this paper, we are going to link the phenomenon of quantifier scope ambiguity and different approaches to the analysis of verbal alternations and explore how the resolution of scopally ambiguous sentences containing quantifiers with both arguments in object positions supports the view that the two alternations are derivationally connected and vice versa. In the next section of this chapter, we are going to introduce the phenomenon of quantifier scope ambiguity and explore the challenges that it presents for current research.

prepositional dative constructions. Yet, the question of which of the alternating frames is the derived one remains open.

2.2. Quantifier Scope: Theoretical Approaches and Research Challenges

Scopally ambiguous constructions have long been the question of interest for many linguists and language philosophers. The issue of scopal ambiguities is particularly relevant for sentences containing quantifiers (Qs), as the presence of two and more Qs allows the variation of possible readings.

In accordance with this thought, a sentence like the one in the example below will have two interpretations (Kiss & Pafel, 2017, p.1):

(7) *Some man danced with every woman*.

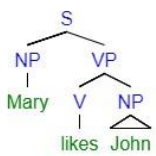
The first reading of the phrase will be as follows: 'There is at least one man (among the men in a given domain) who danced with every woman (in a given domain)'. In this case the existential quantifier *some* takes scope over a universal quantifier *every,* and *every* is c-commanded[2] by *some*.

The second interpretation will imply that 'for every woman (in a given domain), there is at least one (possibly different) man (among the men in a given domain) who danced with her'. This reading is reversed, and here the universal quantifier *every* takes scope over the existential quantifier *some* by means of quantifier raising (a term we will define as follows), which allows

[2] Constituent-command, or c-command, is a principle explaining the hierarchy of structural relationship between the elements of a sentence, introduced by Chomsky (1981). C-command is based on the following notions:

- A c-commands B, if A does not contain B;
- A c-commands B, if neither A nor B dominate each other, and the nearest branching node dominating A, dominates B.

The schematic representation of c-command is illustrated as follows:



In this phrase the NP *Mary* and the VP *likes John* are sister constituents. In a c-command relationship the constituents c-command each other if they are sisters, or if a constituent forms part of the other sister constituent. In other words, *likes* and *John* c-command each other, and *Mary* c-commands *likes John*.

the inverse reading. The possibility of two interpretations are correspondingly the instances of the quantifiers taking either direct or surface scope, or the inverse scope. In the first interpretation, exhibiting direct scope, a quantifier that goes first in the surface order takes scope over the quantifier that follows it, whereas in the inverse scope the latter takes scope over the quantifier that precedes it in surface structure.

The exploration of the phenomenon of relative scope of quantifiers will serve as part of the theoretical framework for the present research. Relative scope of quantifiers can be defined as the scopal interaction of quantified phrases with one another, like the ones in the example (7), and also with other elements that include wh-phrases, negation, as well as some kind of adverbials (Kiss & Pafel, 2017)[3]. Depending on their structural position, quantifiers can have either embedded or matrix scope. In the case of *every* in *every woman* in (7), in the surface reading the quantifier has embedded scope, as its effect is restricted to the minimal clause that contains it (Aoun & Hornstein, 1985). Contrary to this, the quantifier *some* in *some man* in (7) will have matrix scope, so that the quantified phrase containing *every* falls within its scope. However, as the second interpretation showed, by means of quantifier raising (Q-raising) the embedded universal quantifier can take scope over the existential matrix quantifier. Correspondingly, the notion of *being in the scope* will be reflected by the c-command relationship of these quantifiers (Aoun & Hornstein, 1985).

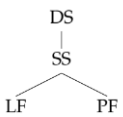
The term of quantifier raising (Q-raising) was introduced in May (1977), and now serves as an explanation to the derivation of quantifier scope, and the way surface structure is mapped on logical form (LF)[4]. Q-raising is a covert movement operation in which by means of raising a

[3] For instance, a sentence like 'Many celebrities didn't like John' may have 2 readings:

1. There are many celebrities who did not respect John.

2. It is not the case that many celebrities respected John.' (Kiss and Pafel, 2017, p.2)

[4] The term Logical Form (LF) refers to the representation of the semantic structure of a sentence. Originally it was introduced in Chomsky (1973) as part of Government and Binding Theory and forms part of the four levels of representation of a sentence:



In the case of quantifier scope ambiguities LF representations show how one single sentences can be analysed in different ways on a semantic level.

quantifier adjoins a sentential node, which determines the semantic scope of a quantifier. The figures below illustrate it as follows:

Figure 1. A tree representation of *Somebody read every book*.

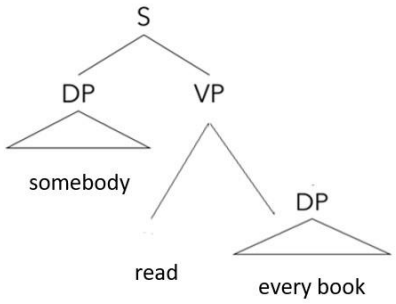
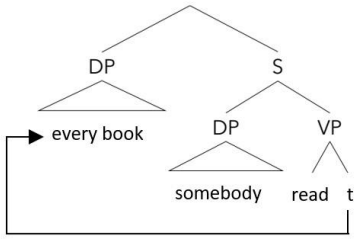


Figure 2. A tree representation of the operation of Q-raising in *Somebody read every book*.[5]



The surface interpretation in Figure 1 implies that there was a particular person who read each of the books (maybe within a delimited set). But in Figure 2, when *every book* undergoes Q-raising, we receive an interpretation, where the inverse scope becomes available, and the reading implies that for every book (within a set) there was a potentially different person (maybe more than one) who read it.

The scope of a quantifier includes everything that it c-commands in LF (May, 1977). Thus, when a quantifier is placed above another by means of the syntactic operation of Q-raising, an

[5] The tree representations in Figure 1 and Figure 2 are very informal and do not take into account the conventions established in generative grammar.

interpretation is provided, in which the former out-scopes the elements it c-commands in deep structure (DS) (Moulton, 2007)[6]. The possibility of mapping a sentence on more than one logical form arises from the fact that quantifiers may be subjected to Q-raising in any order, which results in two possible interpretations (Kiss & Pafel, 2017). Let us take a look at how a sentence containing two quantifiers can have two different LFs, which account for different interpretations:

(8) *Someone saw every movie.*

a. *[Someone[every movie]]saw]]]*.
   'There is one particular person who saw every movie (within a set).'

b. *[Every movie[someone]]saw]]]*.
   'For every movie (in a set) there is a person (maybe more than one) who saw it.'

In generative grammar the scopal ambiguity displayed in sentences containing quantified phrases has been traditionally related to the ambiguity in their structural representation. The main issues associated with the phenomenon of quantifier scope deal with finding an answer to how sentences should be mapped on two alternative structures and at which level of representation they should be constructed. Another research aspect is connected with the variability in the behaviour of scope-bearing operators, as in some cases a sentence containing two or more quantified expressions can have only one interpretation. Let us consider the following examples (Kiss & Pafel, 2017, pp. 2-3):

(9) a. *Who did everybody meet?*

b. *Who met everybody?*

c. *Which is the place that Bobby thinks that every detective will go for vacation?*

[6] The quantifier that undergoes Q-raising leaves an invisible trace in DS, which acts as a variable (Kiss & Pafel, 2017). This operation is an instance of the Empty Category Principle, which we will discuss later in this paper.

The sentence in (9a) presents two possible interpretations, where both the direct and the inverse scope readings are allowed; whereas in (9b) only the surface scope order is exhibited (the inverse scope is blocked). In (9c) the quantifier is embedded in a relative clause, so the scope remains frozen and only one reading will be possible[7].

Moreover, it is equally important to mention that Q-raising is subjected to some structural island-constraints. The examples in (10) demonstrate that these constraints apply specifically to universal quantifiers as they cannot scope out of islands[8], which are relative clauses as in (10a), wh-complements as in (10b), or adjuncts as in (10c) (Moulton, 2007, p.1):

(10) a. *Someone met the child that talked to everyone. ∃> ∀; *∀>∃*

b. *Someone wondered whether I talked to everyone. ∃> ∀; *∀>∃*

c. *Someone left the meeting before I talked to everyone. ∃> ∀; *∀>∃*

In all of these examples, the only possible reading is the one of the surface scope, where the existential (∃) quantifier takes scope over the universal (∀) one[9]. Another constraint on Q-raising, which makes it different from similar long-distance operations is that of clause-boundedness: according to it, universal quantifiers cannot raise if they are found within a finite complement (Moulton, 2007, p.1):

[7] The Empty Category Principle, introduced in Chomsky´s framework (1981), can present explanations for the subject-object asymmetry in scope possibilities in the sentences like (9a) and (9b). According to this principle, when a constituent undergoes movement, it leaves an empty trace on a structural level, but is not overtly present. In the case of sentences where quantifiers are contained within a subject and an object, the subject trace needs a local antecedent, and has to undergo Q-raising before the object. For more explanation, see Chomsky (1981).

[8] The term islands refers to structural constraints that block movement of the constituents, as long as not all syntactic structures allow free movement of its elements. Three common types of islands include wh-phrases, complex NPs and adjuncts (represented by adverbials and etc.).

[9] The notions of universal and existential quantifiers trace back to formal logic: in accordance with this parallel words like all and some in English are considered to convey the meanings of ‘for all’ (∀) and ‘for some’ (∃) correspondingly (Bunt, 2020, p.3). Yet, quantifiers in natural languages do not entirely correspond to those in formal logic. For more, see Bunt (2020).

(11) *Someone wished that Fred would visit anyone. ∃> ∀; *∀>∃*

Once again, this sentence exhibits only surface scope interpretation; the inverse reading where the universal quantifier would take wide scope is blocked.[10]

The majority of the examples that we have explored display quantifier scope ambiguities in the sentences where the quantified NPs are in the subject-object relationship. However, in this paper, we are going to concentrate specifically on quantifier scope ambiguities in double object constructions (DOCs) and prepositional object constructions. In the next two sections, we are going to explore the interaction between the quantified phrases in English and Russian DOCs and prepositional object constructions and identify the existing cross-linguistic similarities and differences.

2.3. Quantifier Scope Ambiguities in Double Object Constructions in English

In English, quantifier scope ambiguities are a frequent instance in double object and prepositional constructions with ditransitive verbs. For instance, let us consider the following sentence with the dative alternating frames of the verb *teach* (Jiménez-Fernández, 2023, p.24):

(12) a. *John taught every language to two persons. ∀>∃; ∃>∀*
b. *John taught two persons every language. ∃>∀; *∀>∃*

Sentence (12a) displays two possible readings depending on whether the existential or the universal quantifier takes scope over the other one. In the first reading, where the universal quantifier *every* has wide scope, the interpretation implies that for every language (within a set), there are potentially two (different) people that John taught it to (Jiménez-Fernández, 2023, p.24). The second interpretation, where the existential Q takes scope over the universal

[10] However, as argued in Moulton (2007, p. 2), clause-boundedness in Q-raising should be limited to finite sentences, as those with infinitival complements like in 'A different nurse began to examine every patient', the Q-raising of *every* is not restricted.

quantifier, presupposes that there are two potentially different people who were taught all the languages, maybe within a delimited set. In the case of (12b) only the second interpretation will be available: the Q-raising of a universal quantifier is blocked and the second sentence proves to be unambiguous.

The same behaviour is exhibited by the verb *give* in English dative alternation:

(13) a. *The teacher gave a book to every student. ∀>∃; ∃>∀*
b. *The teacher gave a student every book. ∃>∀; *∀>∃*

(Jiménez-Fernández, 2023, p.25)

In (13b) the Q-raising of a universal quantifier is blocked again, what leads to only one possible interpretation, so no ambiguity is displayed.

Now, let us turn to locative alternation in English. In this research, we are going to focus on this particular type of verbal alternation, as it has not been as broadly studied as the Dative Shift. In English, the behaviour of locative verbs of the *spray-load* pair is identical to the patterns displayed by verbs in dative alternation, as demonstrated in the examples below (Larson, 1990, p. 604, from Schneider-Zioga, 1988):

(14) a. *The worker loaded one box on every truck. ∃>∀; ∀>∃*
b. *The worker loaded one truck with every box. ∃>∀; *∀>∃*
(15) a. *Max sprayed some slogan on every wall. ∃>∀; ∀>∃*
b. *Max sprayed some wall with every slogan. ∃>∀; *∀>∃*

In (14a) the first interpretation implies that the worker loaded one particular type of boxes on every truck. In the inverse reading, there is a potentially different type of boxes that the worker loaded on every truck. Sentence (14b) displays only one reading: there was only one truck which was loaded with a (possibly different) type of boxes. The *spray*-pair in (15) behaves in the way identical to the *load*-pair.

In addition, in the case of (13) and (14) the ambiguity is caused by the nature of the quantifier itself. Kiss and Pafel (2017), as referring to earlier Fodor and Sag's research (1982), argue that in the case of indefinites, the attested ambiguity may be seen not as scopal but lexical. Let us analyse this grammatical property by appealing to the example in (13b): on the one hand, it has a quantifier interpretation, meaning that the set of students who were given a book is not empty, but, on the other hand, the referential interpretation may imply that there was one particular student who was given a book.[11] We will address more broadly the semantic aspects of certain quantifiers as triggering ambiguity in the context of the principles of ambiguity resolution later in this paper.

In the next section, we will analyse scopally ambiguous constructions with ditransitive verbs in Russian (in particular, those involving locative alternation) and compare the behaviour of verbal alternants with English.

2.4. Quantifier Scope Ambiguities in Double Object Constructions in Russian

In Russian, constructions with ditransitive verbs have equally triggered questions as to the structural composition of verbal arguments. In Russian dative alternation, quantified objects present ambiguous readings similarly to English. Let us consider the following examples (Antonyuk, 2020, p. 45):

(16)a. *Učitel'* *po-dari-l* *[kak-uju-to* *knig-u]* *[každ-omu*
teacher PO-present-PST.M some-ACC.F-IND book-ACC.F every-DAT.M
student-u]. ∃> ∀; ∀> ∃
student-DAT.M

'The teacher presented some book to every student.'

[11] Fodor and Sag (1982) defend the referentiality of indefinites by appealing to their ability to scope out of islands. For instance in a sentence like 'Each teacher overheard the rumor that a student of mine had been called before the dean' the existential quantifier within a complex NP *a student of mine* scopes out of the island (which is a relative clause) and takes wide scope over the universal quantifier within the NP *each teacher*. This is claimed to only be possible when the indefinite possesses referentiality (Kiss & Pafel, 2017, p. 10).
The scopal behaviour of indefinite NPs proves to be heterogeneous, as they exhibit quantificational and non-quantificational uses, specific and non-specific uses and etc., and thus remains a vast domain of research.

b. *Učitel'* *po-dari-l* *[kak-omu-to* *student-u]* *[každ-uju*
teacher PO-present-PST.M some-DAT.M-IND student-DAT.M every-ACC.F
knig-u]. ∃> ∀; *∀> ∃
book-ACC.F

'The teacher presented some student with every book'

In sentence (16a) the Q-raising of the universal quantifier allows two possible interpretations, very similar to the ones we have seen in (13a) and (13b). However, in (16b) the second reading is not available.

The behaviour of Russian ditransitives, while being more complex in particular aspects, is parallel to English in many ways. In Russian, ditransitive verbs normally share the same property of taking an Accusative (ACC) argument (the DO), and a case-marked Oblique (OBL) argument (the IO), which can occur in any order in surface structure (Antonyuk, 2020).[12] Based on the way the permutation in their order affects the possibilities of scopal interpretations, Antonyuk (2020, pp. 48-49) divides Russian ditransitive verb constructions into three groups:

1. The first group, where the DO+IO argument ordering allows ambiguous interpretations, and only the surface reading in the IO+DO ordering;
2. The second group, where the IO+DO argument ordering allows ambiguous interpretations, and only the surface reading in the DO+IO ordering;
3. The third group, where in both orderings quantifier scope ambiguity is exhibited.

For the present research, we are mostly interested in the scopal behaviour of verbs of group 2, and specifically the *spray-load* pair in Locative Alternation. In Russian, the *spray-load* pair functions similarly to English (Antonyuk, 2020, p.46):

(17) a. *Vanja* *za-gruz-i-l* *[kak-oj-to* *vid* *sen-a]*
Vania ZA-load-IPFV-PST.M some-ACC.M-IND type.ACC.M hay-GEN.N ACC.M
[na každ-yj *gruzovik]*. ∃> ∀; ∀> ∃

[12] The fact that Russian has a more flexible word order presents challenges as to stating whether the DO+IO or the IO+DO pattern should be considered as the canonical one. In general, this is the DO+IO pattern which is claimed to be the basic one (Titov, 2017).

on every- ACC.M truck-ACC.M

'Vania loaded some type of hay on every truck.'

b. *Vanja za-gruz-i-l [kak-oj-to gruzovik] [každy-m*

Vania ZA-load-IPFV-PST.M some-ACC.M-IND truck-ACC.M every-INS.M.

vid-om sen-a.] *∃> ∀; * ∀> ∃*

type-INS.M. hay-GEN.N

'Vania loaded some truck with every type of hay.'

In (17a) both readings are available: in surface reading, the interpretation would imply that there was one particular type of hay that Vania loaded on every truck within a present set, whereas in the inverse reading the implication is that for every truck there was a potentially different type of hay that Vania loaded it on. In (17b) only the surface scope is permitted, with the reading implying that there was only one truck on which Vania loaded different types of hay.

The reasons for the differences in quantifier scope behaviour between these three groups must be explained in the context of the principles that restrict one quantified NP from taking scope over another one. These are both structural constraints and the principles of sentence processing, which we will refer to as quantifier scope ambiguity resolution principles. These principles will be used by us as an instrument of proving the relationship between the two alternating object constructions with ditransitive locative verbs in English and Russian and explored in detail in the next section of this paper.

2.5. Quantifier Scope Ambiguity Resolution Principles

Since the beginning of research in quantifier scope, scholars have tried to understand what type of operations a speaker implements in order to solve the ambiguity arising on the processing level. In 1990-s the field has gained experimental support with the research conducted by Kurtzman & MacDonald (1993), Tunstall (1998), Villalta (2003) and others. In the course of theoretical and experimental work, two accounts have emerged as to how scopal ambiguities should be treated: some scholars proposed multi-factor theories (May 1985, Kuno 1991, Kurtzman & Macdonald, 1993), whereas others supported the theory of relativized scope (Beghelli & Stowell 1997; Szabolcsi 1997). While supporters of multi-factor theories claim that the resolution of scopal ambiguity is dependent on a combination of syntactic principles, in the

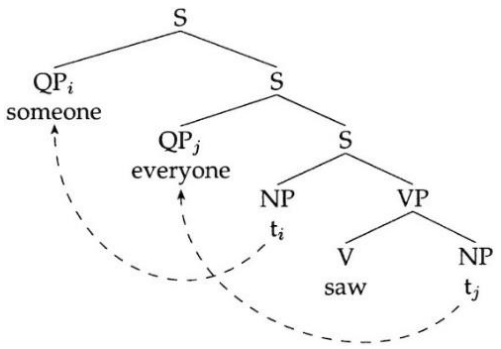
theory of relativized scope the absence of ambiguity is associated with the constraints that quantifiers have with respect to their idiosyncratic properties. A distinct approach takes into account the pragmatic factors and the influence of information structure on the disambiguation of scopally ambiguous sentences containing quantified NPs (Hornstein 1999, Espinal and Villalba 2015, Antonyuk & Larson, 2016, Jiménez-Fernández, 2023). We are going to give a brief account of these principles as follows and focus specifically on the syntactic principles and the phenomenon of scope-freezing.

In research investigating quantifier scope ambiguity there have been formulated specific parsing principles, which operate in the speaker's comprehension system and define the possible interpretations to be adopted.

First of all, let us delve into generally accepted syntactic principles. One of the most widely discussed principles is the linear order principle (VanLehn 1978, Fodor 1982), which refers to the left-to-right reading of the quantified phrase rearrangement in the surface structure of the sentence. The preferred interpretation for the speaker is the one where the quantifier, located in the left periphery of the sentence, takes scope over the quantifier that follows it. Two other principles, the surface subject principle and the external argument principle, originally suggested by Ioup (1975) appeal to the phrase pattern where the quantifiers occur in the determinant position of the subject and the object. The above-mentioned principles, governing the choice of one particular interpretation, depend primarily on the grammatical hierarchy within a sentence: if a phrase, containing a quantifier, occupies the surface or the deep-structure subject position, it will take scope over the quantifier phrase in the object position. For instance, in phrases like 'A kid climbed every tree', the reading 'There is a kid x, such as that for every tree y, x climbed y' is preferred ($\exists x > \forall y$; *x* is a kid & *y* is a tree & *x* climbed *y*: the existential quantifier *a* takes scope over the universal quantifier *every*). In active sentences both of the principles work in the same way, however, for passives there will be contradictions, as the external argument principle in this case will account for the preference of the interpretation of scopally ambiguous sentence .

Another principle, seeking to confirm the association of scope interpretation with the syntactic position of the quantified phrases, is the c-command principle, advocated by Reinhart (1983). In her work, she suggests that the quantified phrase will preferably take scope over another one in the case where the former c-commands the latter on surface structure of the sentence. Such c-command relationship of quantifiers is illustrated as follows:

Figure 3. C-command relationship of *someone* and *everyone*



(Higgins & Saddock, 2003, p. 75)

Note. The tree above illustrates the surface reading of a sentence *Someone saw everyone*, and the way *someone* c-commands *everyone* after both of the quantified NPs undergo Q-raising.

The c-command principle is directly related to the linear order principle, as the deep sentence structure is not seen here as the key criterion for the resolution of quantifier scope ambiguity. However, as Kiss & Pafel (2017) state, Reinhart's approach is not entirely comprehensive in determining the relative scope of quantifiers only by surface c-command. While it predicts scope ambiguities in sentences where quantifiers mutually c-command each other, it does not take into account such cases of scopal ambiguity as sentences with transitive verbs with a quantified subject and a quantified direct object:

(18) *In this office somebody speaks every official language of the UNO*.

Two interpretations may be given depending on how quantifier scope is interpreted: the surface reading implies that in the office there is a particular person who speaks each of the official languages of the UNO. Yet, the operation of Q-raising makes possible an inverse interpretation, which implies that for every language of the UNO there is a person who speaks it in this office.

So far, all of the mentioned syntactic principles account for the preference of a surface reading in a scopally ambiguous sentence by the speakers of a language. For the present research, this assumption implies that the quantifier contained within the first NP in sentences with double object constructions, will be preferred in terms of taking wide scope over the quantifier contained with the following NP.

Apart from syntactically based views, there exist other approaches, as the one belonging to Kempson and Cormack (1981) and May (1985), who claim that scope ambiguity resolution should be explained by semantically based principles. In this case, the phrase expressing the topic of the sentence will have wide scope and take over the phrase in the comment position. In English, the surface subject or the left-most surface constituent normally expresses the topic, thus, it should be predicted that the leftward phrase is the one which will take wide scope and will be preferred by the speakers in terms of interpretation order (Kurtzman, 1993).

Some other quantifier ambiguity resolution principles deal with the idiosyncratic properties of quantifiers, which predict the scope they take in a sentence. For instance, Beghelli and Stowell (1997) provided a classification with five types of quantifiers and their scope abilities depending on the class they belong to:

1. Interrogative QPs (or wh-phrases), with their scope depending on the constraints that wh-phrases are subjected to;
2. Negative QPs, such as no or nobody;
3. Distributive-Universal QPs, such each and every, which can take either wide or narrow scope;
4. Counting QPs, which include decreasing quantifiers (few, fewer) and modified numerals (at most 10 or at least 2); these quantifiers tend to take limited or in situ scope;
5. Group-Denoting QPs, such as a, or some, which allow wide scope readings, even when c-commanded by other quantifiers. (Beghelli & Stowell 1997, p. 73)

In an exerimental study by Kurtzman & Macdonald (1993) one more principle (earlier described in Fodor, 1982) was formulated, which is the single reference principle. In section 2.3. we already mentioned that the ambiguity exhibited in the sentences containing an indefinite *a* is the case of not only syntactic but also lexical ambiguity, as this quantifier clearly possesses referentiality. Thus, the single reference principle states that an existential quantifier *a* is

expected to be interpreted as having one single referent if it is placed before the universal quantifier *every* in a sentence, and will be more likely to take wide scope[13].

In such languages as Russian, the referential properties of quantifiers can also be responsible for provoking ambiguity. In Russian, this is the case for the indefinite pronouns which carry either a *-to* or *-nibud'* suffix: the *-to* suffix normally corresponds to a specific reading while the *-nibud'* suffix to a non-specific, as seen in the examples below (Ioup, 1977, p. 241):

(19) a. *Ona* *xočet* *vyjti* *zamuž* *za kogo-to*
She.3SG.F. wants.PRES.3SG go.INF.PERF married to wh-TO.
'She wants to marry someone (specific).'

b. *Ona* *xočet* *vyjti* *zamuž* *za kogo-nibud'*
She.3SG.F. wants.PRES.3SG go.INF.PERF married to wh-NIBUD'.
'She wants to marry someone (non-specific).'

It is also important to note that the *-nibud'* marker cannot appear in simple declarative senteces. In Geist's (2008) work one more specificity marker is introduced, which is the prefix *–koe*:

(20) *Igor' hochet* *zhenit'sja* *na*
Igor wants PRES.3SG to marry.INF.PURP. at
koe-kakoj/kakoj-to/kakoj-nibud' *studentke.*
KOE-wh/wh-TO/wh-NIBUD' student.LOC.F.
'Igor wants to marry a student.'

(Geist, 2008, p. 153)

[13] One interesting finding correlates with Ioup's study (1975) and the quantifier scope preferences hierarchy that she proposes: *each> every> all > most > many > several > some$_{pl}$ > a few* (Ioup, 1975, pp. 73-74). Yet, in Kurtzman & Macdonald's experiment (1993) it was revealed that there was no specific preference for the universal quantifier *every* to take wide scope over the existential *a*.

The identifiability of the referent by the speaker and the scope determine the disambiguation of the sentences containing these pronominal determiners. Here we are focusing specifically on the way these specificity markers impact the scope of the NPs they can be found within.

As Geist (2008) claims, these three specificity markers exhibit different scopal behaviour: *-koe* indefinites normally take wide scope, whereas *-nibud'* indefinites always take narrow scope. The indefinites containing the *-to* marker behave differently, and can take either narrow or wide scope:

(21) a. *Kazhdyj* *student* *voschischchaetsja*
Every.NOM.MASC. student.NOM.MASC. admire-PRES.3SG
*koe-kakim / -to / *-nibud'* *professor-om.*
KOE-wh /wh-TO/ wh-NIBUD' professor.INS.MASC.
'Every student admires a certain professor.'

b. *Kazhdyj* *student* *voschischchaetsja*
Every.NOM.MASC. student.NOM.MASC. admire-PRES.3SG
**koe-kakim / -to / -nibud'* *professor-om.*
KOE-wh /wh-TO/ wh-NIBUD' professor.INS.MASC.
'Every student admires a professor.'

(Geist, 2008, p.156)

In (21a) the *-to* indefinite takes wide scope, and the interpretation implies that there is a certain professor that every student admires, whereas in (21b) the NP it is in takes narrow scope, and the reading is that 'for every student there is a professor (possibly a different one) that they admire'. The fact that the *-to* indefinites can take either wide or narrow scope with respect to universal quantifiers creates ambiguity in a sentence.

One more semantically based approach, explored by Kurtzman (1993) is based on the thematic hierarchy of the arguments of verbs. This means that a quantified phrase in which the argument bears a θ-role hierarchically higher than that of another argument will take scope over the phrase containing it. Thus, given the hierarchy Agent> Experiencer> Theme, a phrase where the

argument is assigned the role of an Agent or Experiencer will have wide scope over the phrase containing an argument that bears the thematic role of a Theme. For active SVO sentences, such as 'A kid climbed every tree', this principle accounts for the preference of a leftward reading of a sentence, if the leftward subject expresses the Agent and the rightward object the Theme (Kurtzman, 1993). The contrary is proved for passive sentences, such as 'Every tree was climbed by a kid' where the semantic subject moves into the rightward part of the sentence, preserving its scope over the surface subject, and, thus, accounting for the preference in rightward scopal reading[14].

Finally, an important role in disambiguating scopally ambiguous sentences containing quantifiers belongs to information structure[15]. The way in which information is organized within a sentence can affect multiple domains, including the scope possibilities of quantifiers.

Traditionally, it is considered that with respect to information structure (Kuno 1991, Hornstein 1999, Bobaljik and Wurmbrand 2012, Erteschik-Shir 1997, 2007) topics are preferred in terms of taking wide scope in comparison to focus. Antonyuk and Larson (2016) state that the introduction of focus resolves ambiguity in dative alternation when present. By introducing focus on the outer object determiner in an ambiguous sentence, the focused quantifier takes wide scope (Antonyuk & Larson, 2016, p. 2):

[14] In a study by Ioup (1975) she proposes the hierarchy that explains scope preference in terms of grammatical roles of the phrases in which the quantifier is contained:

Topic > Deep and surface subject > Deep subject or surface subject > Prepositional object > Indirect object (IO) > Direct object (DO) (Ioup, 1975: 78-81).

As Ioup's classification denotes, topics would have most preference in terms of taking wide scope over other quantified elements.

[15] Information Structure (IS), meaning the way information is organised within the utterance, has a huge impact on how new entities are introduced into discourse and how references are being made to previously mentioned information (Arnold et al., 2015). There are various approaches as to defining information structure, the general view draws distinction between already given, old information, the topic of the sentence, and new highlighted information, the focus. The difference between the two helps to establish the information status of a word, phrase or the entire sentence.

(22) *Maša potrebovala [DP kakije-to dokumenty][PP s KAždogo posetitelja]*

Masha demanded some documents.ACC from every visitor.FOC *ACC-OBLIQUE*

'Masha demanded some documents from every visitor' (∃>∀, ∀>∃)[16]

The surface reading implies that Masha demanded some specific type of documents from all of the present visitors. The inverse interpretation, where *every* takes wide scope, holds the idea that for every visitor there were some documents (potentially different), that they were demanded from.

However, there will be no changes in interpretations if focus is introduced in an unambiguous sentence, where quantifier scope is frozen:

(23) *Maša potrebovala [PP s kakogo-to posetitelja] [DP KAždyi document]*

Masha demanded from some visitor every document.ACC. *ACC-OBLIQUE*

'Masha demanded every document from some visitor' (∃>∀, *∀>∃)

In other studies, like the one of Espinal and Villalba (2015), IS, however, is not seen as a factor playing any role in the disambiguation of scopally ambiguous structures.[17] To avoid any bias

[16] Antonyuk & Larson (2016) claim that the disambiguation of scopally ambiguous structures when introducing focus is due to a covert focus raising of the focused QP to a high functional projection FP. By means of Q-raising, the focused phrase takes wide scope over other QPs in a sentence.

[17] As opposing to Hornstein's (1999) view of the role of IS in the resolution of quantifier scope ambiguity, the authorsy claim that the assumption that the information status of Qs affects their scope possibilities is not correct. This proposal will be true accurate for sentences like (25):

(25) *Juan regaló un libro a todo el mundo.*
Juan gave.3SG a book to all.MASC the world.
'Juan gave a book to everyone.'

Both QPs are focused, so both of them can take wide scope within this structural position. However, as pointed out by Espinal & Villalba (2015), Hornstein does not take into account the influence that idiosyncratic properties of quantifiers may have on the scope they take.

induced by individual aspects of quantifiers, Espinal & Villalba provide data from Catalan, in which numerical quantifiers are used, to argue in favour of the traditional conception of *topic>focus* preference. The findings showed that in Catalan it is not essential for topics to get wide scope, which may cause focused phrase to overtake it and make the inverse scope available as in (24) (Espinal & Villaba, 2015: p.73-74):

(24) a) *Com els vas avaluar, els alumnes?*

How them MASC. PAST.1SG assign, them MASC students.Pl.M.

'How did you evaluate your students?'

b) [topic *A tres estudiants] [focus els vaig assignar dues tasques…*]

To three students.Pl.M. them MASC. PAST.1SG assign two.FEM tasks

'I assigned two tasks to three students…'

The surface interpretation implies that for the three students altogether two tasks were assigned, whereas the inverse reading suggests that for each of the three students two potentially different tasks were assigned. Consequently, either of the two interpretations is preferable in this context.

So far, we have outlined some of the main syntactic, semantic and information structure principles which can explain the way speakers process ambiguous sentences containing quantifiers and predict the preferred interpretation. Most of the principles that we looked at predict that for scopally ambiguous sentences containing double object constructions with no focus introduced on either of the quantified NPs, the surface scope interpretations are the ones to be most likely chosen by the speakers. However, as we have seen in 2.3. and 2.4. in both English and Russian locative alternation in one of the patterns the ambiguity is not present, and the Q-raising of a universal quantifier gets blocked. This phenomenon is known as scope-freezing and will serve in the present research as a means of accounting for either the derived or non-derived nature of verbal alternations in both Russian and English.

As suggested by Antonyuk (2015) scope-freezing is a frequent phenomenon both in English and in Russian alternating structures with the object NPs containing an existential and a universal qunaitifer. Yet, in Russian the range of constructions where scope-freezing is

exhibited proves to be much broader than in English. Taking into account the differences between these constructions, Antonyuk proposes the following Scope Freezing Generalization (2020, p. 48):

> 'Scope freezing results when one QP raises over another to a c-commanding position within the VP as a result of a single instance of movement.'

As Antonyuk (2022) states, in sentences with no constraints on the syntactic movement, such as clause boundaries or islands, and where an NP containing an existential quantifier precedes an NP with a universal quantifier in surface structure, quantifier scope ambiguity and not its absence should be considered the norm.

This statement leads us to the question of what triggers scope-freezing and the disambiguation of scopally ambiguous DOCs. One of the proposals on the issue was made by Bruening (2001) and encompasses the idea of superiority. Bruening states that Q-raising has to obey superiority[18] and both quantifiers in a double object construction are able to raise out of the VP, but in such a way that scope remains frozen. That is, movement is unable to reorder quantifiers, contrary to expectation (2001, p. 235).

Moreover, Bruening argues that frozen scope can be treated as a norm, and it uncovers important implications behind Q-raising: the author proposes that scope-freezing shares similar patterns with other syntactic operations involving movement, and obeys the economy constraints.[19] These constraints restrict Q-raising by applying it to the closest available QP. This

[18] With the term of superiority we refer to the Superiority Condition introduced in Chomsky (1973, p.246):

a) 'No rule can ivolve X,Y in the structure
…X…[…Z…WYV…]…
Where the rules applies ambiguously to Z and Y, and Z is superior to Y.

b) The category A is superior to the category B if every major category dominating A dominates B as well but not conversely.

This condition is particularly visible in sentence with two wh-constituents, which are subjected to wh-movement. For instance in a sentence like 'I wonder who saw what', the wh-subject is in a superior position with respect to the wh-object, so the movement of a wh-object to the CP will violate this condition and result in an ungrammatical sentence 'I wonder what did who see'. Yet, many languages, such as Polish, do not seem to obey this condition (the examples taken from Rikardo et al., 2021).

[19] Bruening's proposal of Superiority Constraint (2001) is based on the idea that the two QPs originate in separate VPs, and while both can undergo Q-raising, one of the QPs will always fall into the scope of another, thus obeying superiority.

view, however, is refuted in Antonyuk and Mykhaylyk (2022), who claim that superiority does not condition Q-raising or cause scope to be frozen by providing data from Ukrainian[20].

Thus, for the moment it may be concluded that there exist completely distinct views on the origins of scope-freezing, and it is not entirely clear what the causes of scope-freezing are and in what ways its occurrence can be predicted. Yet, as far as the DOCs are concerned, scope-freezing is described as follows in Cepeda & Cyrino (2020, p.105) with respect to Dative Shift in English, Spanish and Brazilian Portuguese:

> When DO contains an existential quantifier (DO∃), IO contains a universal quantifier (IO∀), and the order is DO∃> IO∀, the sentence is scopally ambiguous: it has both a surface and an inverse scope reading. In contrast, when DO contains a universal quantifier (DO∀), IO contains an existential quantifier (IO∃), and the order is IO∃> DO∀, the scope in the sentence is frozen: no ambiguity is exhibited.

However, with respect to locative alternation, scope-freezing effects are more diverse across languages. While in Spanish or Brazilian Portuguese locative alternation both patterns will exhibit ambiguous interpretations, for English and Russian only surface scope readings will be available, as has been demonstrated in 2.3. and 2.4. Thus, based on the explored ambiguity resolution principles and the behavioural pattern of ditransitive verbs in locative alternation in English and Russian, we suggest that the expected perception of both the surface and the inverse readings or the preference for surface readings in scopally ambiguous sentences with locative alternating frames and the disambiguation displayed in locative alternating constructions where quantifier scope remains surface frozen, leads us to the derivational view of locative alternation in both of the studied languages. In order to avoid interpretational bias, we are going to rely on a combination of ambiguity resolution principles, as complementing each other. Our hypotheses will be tested in the next chapter of this research, where we will analyse the way both L1 Russian speakers and L1 English speakers process scopally ambiguous and scopally frozen sentences with double object and prepositional object constructions in locative alternation. The correspondence of the results with the predictions made at the beginning of the experiment will lead us to conclude whether locative alternating structures in both languages have a derived or a non-derived nature.

[20] In Ukrainian, sentences with DOC allow both Q-raising and Object Shift (OS), and if the OS obeys Superiority, where argument inversion is triggered in order to enable a structurally lower object phrase to raise, Q-raising does not (for more, see Antonyuk & Mykhaylyk, 2022).

3. Exploring Quantifier Scope Ambiguity Resolution in Locative Double Object Constructions in English and Russian

In this chapter, we are going to provide experimental evidence for testing the principles of quantifier scope ambiguity resolution. To complete this objective, an experimental quantitative online study has been conducted, in which native speakers of both English and Russian had to select the pictures corresponding to different interpretations of the sentences with respect to quantifier scope.

In compliance with the earlier explored ambiguity resolution principles, we expect the informants to give preference to both the surface and the inverse readings in ambiguous sentences (with the general preference for surface reading) and choose the surface interpretation as the only available one in scopally frozen sentences.

3.1. Participants

The respondents who took part in this research were L1 English speakers and L1 Russian speakers. The age range for English-speaking participants varied from 16 to 38 years old, and from 22 to 28 years old for Russian-speaking participants. A total of 30 informants (15 native English-speakers and 15 native Russian-speakers) remained in the study after the exclusion based on age (two native English speaking participants excluded as not fitting within the 16-38 age range) and education level (1 native English-speaking participant excluded as being homeschooled).

Gender and place of residence were two other factors taken into account in the selection of the participants. The English-speaking respondent group consisted of 46.7% of male and 46.7% female informants respectively, while for the Russian-speaking participant group the majority (80%) of the informants were women, with men forming only 20% of the respondent group.

The majority of native English-speaking participants (46, 7%) were based in the USA with the overall participant group being relatively heterogeneous as to their place of residence: 20,1% of the participants were based in England, 13,4% in Ireland, 6,7% in Wales, 6,7% in Norway (1 native British English speaker residing in Norway) and 6,7% in Australia. As for native Russian-speaking participants, 80,1% were based in Russia with the rest of the respondents being residents in Spain (13,4%) and France (6,7%).

All of the participants signed an agreement to participate in a survey on a voluntary basis. The participation in the survey was anonymous.

3.2. *Methodology*

In order to answer our research questions, two experiments were conducted. Two questionnaires, containing ambiguous and unambiguous sentences, were designed in both English and Russian. Each of the questionnaires consisted of four personal data questions, five questions with ambiguous and five questions with unambiguous sentences with locative verbal alternation and four questions used as distractors with ambiguous and unambiguous sentences containing alternating frames with dative verbs.

In the survey aimed at English-speaking participants such locative verbs as *spray, smear*, *load, sprinkle* and *spray* were tested. In Russian the verbs *zagruzit'* (load), *namazat'* (spread), *posipat'* (sprinkle), *povyazat'* (tie around), *zalit'* (fill) were used in questionnaires. All of the questions were preceded by a context.

As we have mentioned earlier in the theoretical part, in both Russian and English, sentences with locative alternating frames can exhibit both ambiguous and unambiguous readings in the cases where a direct object with an existential quantifier (∃) precedes an indirect object with a universal quantifier (∀) in surface order. Therefore, for each of the verbs a pair of sentences was designed: the first sentence in a pair was scopally ambiguous and had two possible readings, whereas the second sentence was scopally frozen. In the table below both ambiguous and unambiguous sentences are presented:

Table 1

Sentences with DOCs with Locative Alternation, English.

Ambiguous (∃>∀, ∀>∃)	Unambiguous (∃>∀, *∀>∃)
1. Lewis loaded a package on every van.	1. Lewis loaded a van with every package.
2. My brother spread some kind of cream on each cake.	2. My brother spread some cake with each kind of cream.
3. Grandmother spread some insecticide on every plant.	3. Grandma sprayed some plant with each insecticide.

4. The kid smeared some paint on every couch.	4. The kid smeared some couch with every paint.
5. The chef sprinkled a spice on every dish.	5. The chef sprinkled a dish with every spice.

Table 2

Sentences with DOCs with Locative Alternation, Russian.

Ambiguous (∃>∀, ∀>∃)	Unambiguous (∃>∀, *∀>∃)
1. Vania zagruzil kakuju-to Vania ZA-load-IPFV-PST.M some-ACC.F-IND korobku v každij gruzovik. box.ACC.F in every.ACC.M. truck.ACC.M.	1. Vania zagruzil kakoj-to Vania ZA-load-IPFV-PST.M some-ACC.M-IND gruzovik každoj korobkoj. truck.ACC.M. every.INS.F. box.INS.F.
2. Moj brat namazal My.Nom.M. brother NA-spread-IPFV-PST.M. kakoe-to maslo na some-ACC.M.-IND oil-ACC.NEUT. on každij tost. every.ACC.M. toast.ACC.M.	2. Moj brat namazal My.Nom..M. brother NA-spread-IPFV-PST.M. kakoj-to tost some-ACC.M.-IND toast.ACC.M. *with každim maslom every.INS.NEUT. oil.INS.NEUT.
3. Povar posipal kakoj-to Chef PO-sprinkle-IPFV-PST.M. some-INS.F.-IND spetsijej každoje bludo. spice.INS.F every.ACC.NEUT. dish.ACC.NEUT.	3. Povar posipal kakoje-to Chef PO-sprinkle-IPFV-PST.M. some ACC.F.IND bludo každoj spetsiej. dish.ACC.NEUT. every.INS.F. spice.INS.F.
4. Mama povyazala kakoj-to Mom PO-tie around-IPFV-PST.F. some INS.F.-IND lentoj každij tsvetok. ribbon.INS.F every.ACC.M. flower.ACC.M.	4. Mama povyazala kakoj-to Mom PO-tie around-IPFV-PST.F. some ACC.M.IND tsvetok kajdoj lentoj. flower.ACC.M. every.INS.F. ribbon.INS.F.
5. Rabochij zalil kakuju-to Worker fill IPFV-PST.M. some.ACC.F.IND. židkost' v každij bak. liquid.ACC.F. in every.ACC.M. barrel.ACC.M.	5. Rabochij zalil kakoj-to Worker fill IPFV-PST.M. some.ACC.F.IND bak každoj židkostju. barrel.ACC.M. every.INS.F.-IND liquid.INS.F.

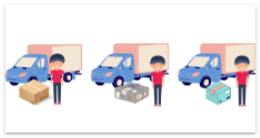
Each of the research questions contained two pictures supporting either a direct or inverse reading of a tested sentence. Each question contained three answers which corresponded either to the choice of one or both of the pictures by the participant of the survey. A sample of one of the questions is provided below:

Figure 4. An example of an ambiguous sentence with the verb *load* (∃>∀, ∀>∃)

1. [Context: A delivery guy has to load some packages before shipping.] *

Lewis loaded a package on every van.

Option A



Option B

Both are correct

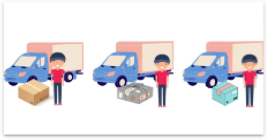
Figure 5. An example of a scopally frozen sentence with the verb *load* (∃>∀, *∀>∃)

12. [Context: A delivery guy has to load some packages before shipping.] *

Lewis loaded a van with every package.

Option A

Option B



Both are correct

To answer the questions, the respondents were to choose one of the three available options: either an inverse or a surface scope interpretation, or both interpretations. For ambiguous sentences, option A corresponded to an inverse scope reading (∃>∀, *∀>∃), option B to a surface scope reading (∃>∀, ∀>∃). For unambiguous sentences, option A corresponded to a surface scope reading and option B to an inverse scope reading. For both ambiguous and unambiguous sentences, the option 'Both are correct' corresponded to the preference of both a surface and an inverse scope interpretation.

3.3. Materials & Procedure

Both questionnaires were designed with the help of Google Forms, a software used to create online forms and surveys. The pictures used for the questionnaires were made with the help of Canva, a free online graphic design tool.

Both L1 English speakers and L1 Russian speakers were tested online. The questionnaires were distributed by a shareable link provided in Google Forms to each of the participants. Before completing the survey the respondents had to sign an agreement for the processing of their data. All of the informants were provided with instructions before completing the survey and asked to pay attention to the context preceding each answer. The participants were informed that there were no correct answers in the survey but that they were to answer based on their perception. No time restrictions were set on completing the questionnaires.

3.4. Data Collection and Analysis

Each of the answered surveys was automatically stored in an Excel document, with two separate sheets for surveys in English and Russian. The stored answers were automatically analysed in Google Forms using the 100% percentage scale. For both ambiguous and unambiguous sentences mean scores[21] were calculated by using the standard mean formula $\bar{x} = (\Sigma x_i) / n$, where $\bar{x}$ stands for the achieved mean score, Σx_i stands for the sum of all the x-values and n denotes the number of tested items in the sample that the sum is divided by. For unambiguous

[21] In this research, mean score stands for an average value found for the surface/inverse interpretation preferences or the absence of preference (where the informants mark both answers as correct). In the case of calculating mean scores for the surface and the inverse readings, the result is achieved by dividing into two the summed initial surface/inverse reading preference percentage and a half of the both readings preference percentage.

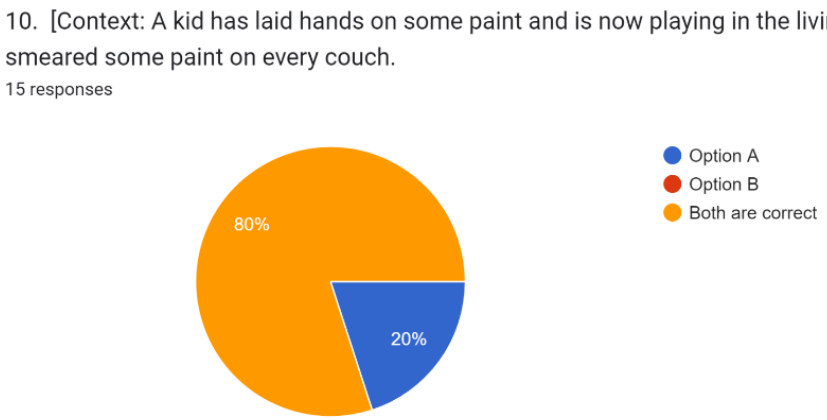
sentences, mean scores were calculated for the preference of surface scope interpretations. For ambiguous sentences, mean scores were calculated for the preference of surface scope interpretations, the inverse scope interpretations and the preference of both the surface and the inverse scope interpretations (where the respondents chose both answers as available interpretations). Surface and inverse scope interpretations were calculated by using the corresponding mean formulae $\bar{x} = (x_{sinv}) /n + x_{s,}$ and $\bar{x} = (x_{sinv}) / n + x_{inv}$. In these formulae $\bar{x}$ stands for the achieved mean score, x_{sinv} for the x-value corresponding to the answer favouring both interpretations only, n for the number of tested items in the sample and x_s and x_{inv} for the surface and the inverse score figures respectively.

3.5. Results

For scopally ambiguous sentences in English, the achieved results indicated the overall speakers' preference for both of the interpretations, with the mean score = 62,66%. For the verbs *load* and *smear* the majority of the respondents, 86,7% and 80% respectively indicated the preference for both of the two readings, with either the existential (∃) or the universal (∀) quantifier taking scope one over another (Figure 6 and Figure 7):

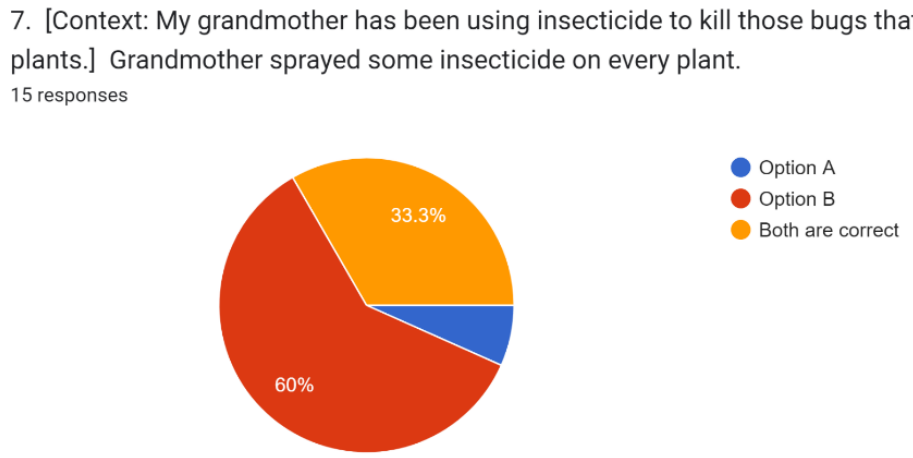
Figure 6. Processing of a scopally ambiguous sentence with *load*

Figure 7. Processing of a scopally ambiguous sentence with *smear*



For the verbs *spread* and *sprinkle* although still prevalent, the preference for both of the possible readings was much lower, 60% and 53,3% respectively. For both verbs, a certain percentage of participants displayed the preference for either of the two readings: for the verb *spread* an equal number of the respondents indicated preference for either direct (20%) or inverse (20%) quantifier scope interpretations as the only possible ones. For the verb *sprinkle*, the preference for inverse scope as the only one possible was slightly higher – 26,7%, with 20% indicating the preference only for direct scope interpretation. The same pattern was displayed with respect to the verb *smear*: 20% of the respondents indicated the preference for inverse scope reading as the only possible. The verb *spray* resulted as the hardest for the participants in terms of the availability of both interpretations: only one third of the respondents (33,3%) displayed preference for both of the interpretations as possible. Yet, 60% of the respondents exhibited preference for the surface scope reading (option B) in the ambiguous sentence with *spray* as the only available reading.

Figure 8. Processing of a scopally ambiguous sentence with *spray*



Yet, we achieve distinct results after analysing the answers in terms of only the surface or the inverse reading preference. In the table below, mean scores for either the surface or the inverse interpretations of the sentences with each of the tested verbs are presented:

Table 3. Mean scores for surface and inverse readings in scopally ambiguous English sentences

Scopally ambiguous sentences (∃>∀, ∀>∃)	Mean score for surface reading	Mean score for inverse reading
1. Lewis loaded *a* package on *every* van.	50%	50%
2. My brother spread *some* kind of cream on *each* cake.	50%	50%
3. The chef sprinkled *a* spice on *every* dish.	46,65%	53,35%
4. Grandmother sprayed *some* insecticide on *every* plant.	76,65%	23,35%
5. The kid smeared *some* paint on *every* couch.	40%	60%
Overall (mean):	52,66%	47,34%

As the table shows, after analysing mean scores for each of the verbs separately, no specific preferences were exhibited as to the quantifier scope in sentences with the verbs *load* and

spread, a strong surface scope preference was displayed for the verb *smear*, and the inverse scope interpretations for the verbs *spray* and *sprinkle*. Overall, the mean score for the surface scope preference in ambiguous interpretations is 52,66%, whereas for the inverse scope the mean score = 47,34%.

For English unambiguous sentences the results achieved showed that native English-speaking respondents tend to give preference to surface scope interpretations as the only possible, with mean score = 83,3% for all tested scopally frozen sentences with locative alternating frames. For the verbs *smear* and *sprinkle* in the constructions with DO∃ + IO∀, 100% of the respondents displayed only the frozen surface scope perception of the sentences, with the existential quantifiers *some* and *a* taking wide scope and the universal quantifier *every* taking narrow scope. Similar results were shown with respect to the verb *load*: 93.3% of the respondents selected the answer corresponding to the surface scope reading of the sentence, with the existential quantifier *a* taking wide scope over the universal quantifier *every*.

Table 4. Mean scores for surface and inverse readings in scopally frozen English sentences

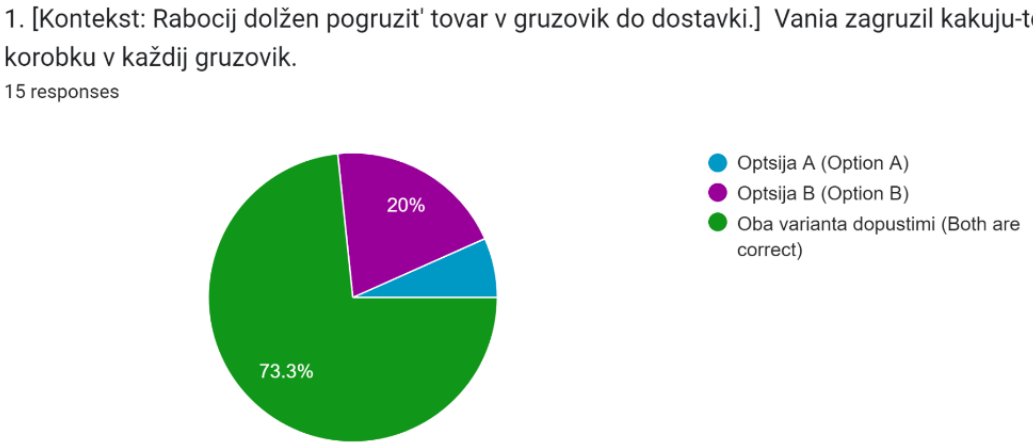
Scopally ambiguous sentences (∃>∀, ∀>∃)	Mean score for surface reading	Mean score for inverse reading
1. Lewis loaded *a* van with *every* package.	93,3%	6,7%
2. My brother spread *some* cake with *each* kind of cream.	76,7%	23,3%
3. Grandmother sprayed *some* plant with *each* insecticide.	73,35%	26,65%
4. The kid smeared *some* couch with *every* paint.	100%	0%
5. The chef sprinkled *a* dish with *every* spice.	100%	0%
Overall (mean):	88,67%	11,33%

For the verbs *spray* and *spread* more than two thirds of the respondents (66,7%) displayed the preference for the scopally frozen surface reading of the sentences as the only possible one. Yet, 20% of the respondents reported that sentences containing these verbs with DO∃ + IO∀ constructions could have more than one reading and 13,3% chose the inverse reading of the sentence as preferred and the only available reading. The overall mean score for surface

interpretations for unambiguous sentences when taking into account the speakers' preference of both readings = 88,67%.

Now let us turn to the analysis of the results for sentences in Russian. As long as Russian locative alternation with the verbs of the *spray/load* group follows the same pattern as English, similar results were expected. Yet, for tested scopally ambiguous Russian sentences, the variation in results was much broader. The achieved figures demonstrated that Russian respondents gave a lower preference to the availability of both interpretations as compared to English respondents, with the mean score = 52%. The highest preference for both the surface and the inverse readings was shown in the questions with the verbs *zagruzit'* (load) and *povyazat'* (tie around), being 73,3% and 66,7% respectively (Figure 9):

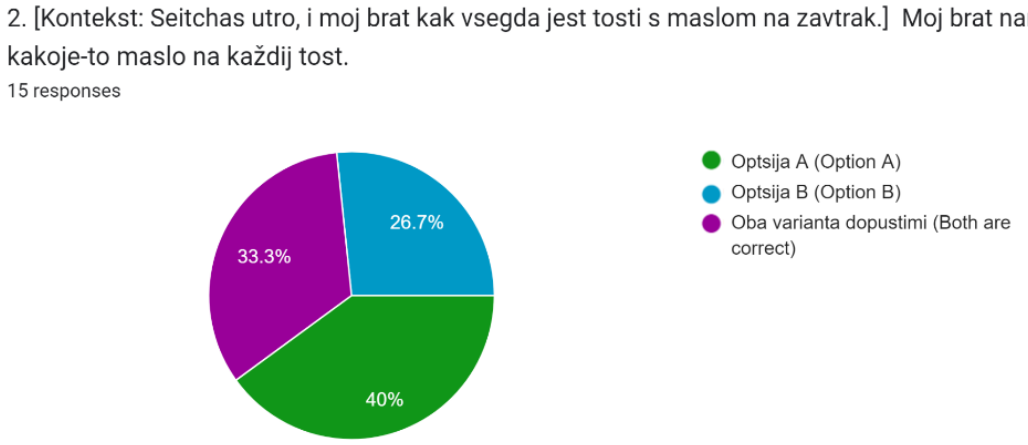
Figure 9. Processing of a scopally ambiguous sentence with the verb *zagruzit'* (load)[22]



The lowest figures were exhibited in the phrases containing verbs *zalit'* (fill), *posipat'* (sprinkle) and *namazat'* (spread), being 46,7%, 40% and 33,3% respectively:

[22] The sentences appearing in Figure 9 and Figure 10 were transcribed from Russian, as the language uses a non-latin writing system. Yet, as long as the questionnaire was aimed at Russian native speakers, the original version can be found in Appendix 2 on p. 64 of the present paper.

Figure 10. Processing of a scopally ambiguous sentence with the verb *namazat'* (spread/smear)



For the verb *namazat'* (spread), the preferred interpretation was the one of the inverse scope with the universal quantifier taking wide scope, with 40% choosing the inverse scope as the only possible interpretation and mean score = 56,65%. For the verb *posipat'* (sprinkle) the majority of the respondents chose the surface reading as the only possible, with the initial figure = 46,7 % and the mean score = 66,7%. For sentences with the verbs *zagruzit'* (load) and *povyazat'* (tie around), 20% and 33,3% of the respondents indicated preference for the surface scope reading only with the mean score for *zagruzit'* = 56,65 and for *povyazat'* = 66,65% with none of the respondents indicating preference for the inverse scope. The rest of the figures are presented in the table below:

Table 5. Mean scores for surface and inverse readings in scopally ambiguous Russian sentences

Scopally ambiguous sentences (∃>∀, ∀>∃)	Mean scores for surface reading	Mean scores for inverse reading
1. Vania zagruzil kakuju-to Vania ZA-load-IPFV-PST.M some-ACC.M-IND korobku v každij gruzovik. box.ACC.F in every.ACC.M. truck.ACC.M.	56,65%	43,35%
2. Moj brat namazal My.POSS.M. brother.. NA-spread-IPFV-PST.M.	43,35%	56,65%

	kakoe-to maslo na každij some-ACC.M.-IND oil-ACC.NEUT. on every.ACC.M. tost. toast.ACC.M.		
3.	Povar posipal kakoj-to Chef. PO-sprinkle IPFV-PST.M. some-INS.F.-IND spetsijej každoje bludo. spice.INS.F every.ACC.NEUT. dish.ACC.NEUT.	66,7%	33,3%
4.	Mama povyazala kakoj-to Mother PO-tie around IPFV-PST.F. some INS.F.-IND lentoj každij tsvetok. ribbon.INS.F every.ACC.M. flower.ACC.M.	66,65%	33,35%
5.	Rabochij zalil kakuju-to Worker ZA-fill IPFV-PST.M. some.ACC.F.IND. židkost' v každij bak. liquid.ACC.F. in every.ACC.M. barrel.ACC.M.	56,65%	43,35%
	Overall (mean):	58%	42%

As shown in Table 4, for scopally ambiguous sentences the participants gave preference to the surface order interpretation, yet in the case of the verb *namazat'* (spread) the preference is given to the inverse scope reading. Overall, for scopally ambiguous sentences in Russian the mean score for surface reading preference = 58%, and the mean score for inverse reading preference = 42%.

For Russian unambiguous sentences the results achieved showed that native Russian-speaking respondents tend to perceive scopally frozen sentences with the surface reading as the only available, with the mean score = 90,66%. The highest percentage for surface scope interpretation was displayed in the question with the verb *posipat'* (sprinkle), where 100% of the respondents displayed preference for this reading as the only possible. For the verbs *zalit'* (fill) and *povyazat'* (tie around) 93,3% of the respondents indicated preference for surface scope interpretation, whereas for the rest of the 2 verbs, *namazat'* (spread) and *zagruzit'* (load), 86,7% and 80% of the participants chose the frozen surface scope reading as the only available one.

Table 6. Mean scores for surface and inverse readings in scopally frozen Russian sentences

Scopally frozen sentences (∃>∀, *∀>∃)	Mean scores for surface reading	Mean scores for inverse reading
1. Vania zagruzil kakoj-to Vania ZA-load-IPFV-PST.M some-ACC.M-IND gruzovik každoj korobkoj. truck.ACC.M every.ACC.F. box.INS.F.	83,35%	16,65%
2. Moj brat namazal My brother.NOM.M. NA-spread-IPFV-PST.M. kakoj-to tost každim some-ACC.M.-IND toast-ACC.M. every.INS.N. maslom. oil/butter.ACC.N.	86,7%	13,3%
3. Povar posipal kakoje-to Chef PO-sprinkle IPFV-PST.M. some-INS.N.-IND bludo každoj spetsijej. dish.ACC.N every.INS.F. spice.INS.F.	100%	0%
4. Mama povyazala kakoj-to Mother PO-tie around IPFV-PST.F. some INS.M.IND tsvetok každoj lentoj. flower.ACC.M every.INS.F. ribbon.INS.F.	93,3%	6,7%
5. Rabochij zalil kakoj-to Worker ZA-fill IPFV-PST.M. some.ACC.M.IND. bak každoj židkostju barrel.ACC.M. every.ACC.F. liquid.ACC.F.	93,3%	6,7%
Overall (mean):	91,33%	8,67%

3.6. Discussion

Overall, the achieved results for both ambiguous and unambiguous sentences found correspondence with the initial predictions. For scopally frozen sentences in both Russian and

English the majority of the respondents indicated preferences for the surface reading as the only available one: 83,3% (mean) for English, 90,66% (mean) for Russian. In the same way, for ambiguous sentences the majority of the speakers identified the preference for both the surface and the inverse readings: 62,66% (mean) for English and 52% (mean) for Russian. The comparison of the interpretation preferences in English and Russian is presented in the table below:

Table 7. The acceptance rate of both surface and inverse readings in locative alternation in English and Russian

English Verbs	Acceptance Rate	Russian Verbs	Acceptance Rate
Load	86,7%	Zagruzit’	73,3%
Smear	80%	Povyazat’	66,7%
Sprinkle	53,3%	Posipat’	40%
Spread	60%	Namazat’	33,3%
Spray	33,3%	Zalit’	46,7%

As illustrated in Table 7, English native-speaking respondents tend to perceive better the availability of both the surface and the inverse scope as compared to Russian native-speaking respondents. Yet, as it was shown in Table 5, for scopally ambiguous sentences a general preference for surface scope interpretations was exhibited: 52,66% (mean) for English and 58% (mean) for Russian (see Table 3 and Table 5). The general preference for both the inverse and the surface interpretation, or the surface interpretation as the only possible one in locative alternation in both English and Russian supports our claim that the alternating locative constructions in these languages should be analysed derivationally.

Nevertheless, it should be pointed out that some of the findings contradict the expected results. One of the first points worth paying attention to is the fact that the existing difference between the surface and the inverse scope for ambiguous English sentences is not very significant: 52,66% for surface scope interpretations and 47,34% for inverse scope interpretations as illustrated in Table 3. The same applies to ambiguous Russian sentences: 58% for the surface scope interpretations and 42% for the inverse scope interpretation as illustrated in Table 5. The results that we predicted on the basis of the earlier explored ambiguity resolution principles,

would favour a stronger preference for the surface scope reading in scopally ambiguous sentences, so such an outcome was not expected.

Another interesting finding is related to the difference in scopal behaviour that similar verbs exhibited in English and Russian. The first pair to display variation in preferred interpretations is the English verb *smear* and its Russian equivalent *namazat´*. In English 76,65% of the participants indicated the preference for the surface reading for the verb *smear*, whereas in Russian 56,65% of the participants preferred the inverse reading for the verb *namazat'*. It should be said that this verb could also be paired with the English verb *spread*, as *namazat'* is semantically broader and encompasses the meanings of both of these verbs. Yet, for *spread* in English the participants indicated no specific preference for the interpretation: 50% preferred the surface scope interpretation and 50% the inverse scope interpretation in a scopally ambiguous sentence. The reverse pattern was displayed by the pair *sprinkle* in English and *posipat'* in Russian. While in Russian, 66,7% of the participants indicated preference for the surface reading, in English for the same verb 60% of the respondents indicated the preference for the inverse reading. None of the earlier discussed quantifier scope ambiguity resolution principles could predict such an outcome.

One more unexpected pattern that drew our attention is connected with the scopal possibilities that the same quantifiers exhibited with respect to different verbs. According to the syntactic principles of linear order and surface c-command, the single reference principle and the quantifier typology discussed in 2.5., group-denoting quantifiers such as *a* and *some* contained within quantified NPs were to take wide scope over the NPs containing universal quantifiers: yet, this was not the case for ambiguous sentences containing verbs *sprinkle* and *smear*. On the one hand, this leads us to conclude that the quantifier *a* and *some* may not always be more prone to taking wide scope over the universal quantifier *every*, and that their behaviour may change depending on the semantic factors and the specific interpretation that this quantifier has when interacting with different locative verbs and their arguments.

In Russian, the same pattern was exhibited for the quantified indefinite *kakoe-to/kakoi-to/kakaya-to (a/some)*. Although in the rest of the tested ambiguous sentences this quantifier was taking wide scope, in the alternation with the verb *namazat'* (spread) the speakers preferred the inverse interpretation, with the universal quantifier *každij* (*every/each*) taking wider scope. There are other factors which could have influenced this preference, such as the context and more complex semantic principles that we do not take into account in the present research.

4. Conclusions

Summing up, after having studied the phenomena of alternating locative double object constructions and quantifier scope ambiguity and having considered in depth previous theoretical and experimental findings, we have carried out our own experimental study. The achieved results led us to conclude the following:

1. Our first hypothesis (predicting no interpretation preference for ambiguous sentences and the surface interpretation for unambiguous sentences) was confirmed as the majority of both native English-speaking and Russian-speaking respondents expressed preference for the surface and the inverse readings in scopally ambiguous sentences and a strong preference for the surface reading in scopally frozen sentences;
2. Our second hypothesis (predicting the same processing patterns for both English and Russian) has been confirmed only partially, as for some verbs, like the *load/zagruzit'* pair, there was cross-linguistic correspondence, while for other pairs like *sprinkle/posipat'* and *smear/spread/namazat',* there was no cross-linguistic correspondence distinct scope interpretations were displayed for ambiguous sentences in both languages. Thus, we infer that the participants of the study may have implemented a combination of different processing principles, which led to distinct interpretation preferences for scopally ambiguous sentences. Moreover, these differences may be explained by some important factors that we did not take into account in the present research, such as context, information structure and specific semantic aspects that are inherent to these verbs in either of the two studied languages;
3. Our third hypothesis (predicting the similar scope-taking possibilities for existential and universal quantifiers in both English and Russian) has been partially proved, as in some cases cross-linguistic correspondence was displayed, whereas for other cases it was not present. What is more, there were cases of lack of correspondence even within tested language: while for Russian scopally ambiguous tested sentences for all the verbs except *namazat'* the existential quantifiers took wide scope over the universal quantifiers, in English the existential quantifiers *a* and *some* showed no propensity for taking strong wide scope over the universal quantifiers *each* and *every*;
4. Our fourth and final hypothesis (suggesting a strong surface preference for ambiguous sentences as based on the explored sentence processing principles) has been proved to some extent, as the ambiguity resolution principles that we described in the theoretical part of the present research would only favour surface scope interpretations and not vice

versa. Thus, we assume that more complex principles should be taken into account in future research, which would explain the inverse scope preferences for situations where more general principles fail to predict them.

Overall, the empirical evidence for both ambiguous and unambiguous sentences tested in the course of the experiment confirmed our main hypothesis and proved that both English and Russian double object constructions with locative ditransitive verbs should be analysed derivationally. Yet, by appealing to the obtained results we state that although final mean scores account for the derivational analysis of locative alternation in Russian and English, in both languages the same verbs may exhibit different behaviour. On the basis of this claim we may infer that even within one specific verb group there may be diverging cases and verbs that exhibit individual behaviour and do not obey the generalised predictions.

The conducted study proved to possess some limitations that may have led to bias in the obtained results. First, it is necessary to admit the heterogeneous character of the respondent group. One of the main limitations concerns a very large age gap present in the sample group of English native speakers (ranging from 16 to 38 years old) and a relatively homogenous age group of Russian participants (ranging from 22 to 28 years old). Another limitation is related to the respondents' education level: in the group of English-speaking respondents a variety of educational backgrounds is exhibited, whereas in the group of Russian-speaking respondents all of the members are in possession of a university degree. One more limitation deals with the number of the respondents itself: as there are only 15 participants for each of the languages, it is hard to assume whether the provided sample is enough for making definitive statements. One more factor not taken into account in this study is the knowledge of other languages and the corresponding interference it could have on the answers of the respondents. Although none of the participants was truly bilingual, all of them were exposed to other languages, which may have created a bias for the achieved results. The final limitation with respect to the respondent group deals with the lack of thorough control for the answers: there were no time restrictions set and the survey bias could have affected the final data. Yet, all of these factors are an instance of the difficulties that we experienced while searching for monolingual English-speaking respondents willing to take part in a survey.

Some other limitations are related to the implemented methodology. As long as this research is a pilot study and had to be conducted in a very limited time frame, the amount of tested verbs was very restricted. This instance may as well have impacted the results. Also, for tested English

sentences the variety of English that the respondents dominated was not taken into consideration, as certain patterns may sound unnatural for the speakers of certain varieties.

Hence, further research is required, in which we intend to take into account all of the above-mentioned limitations. A more thorough selection of participants has to be made, with focusing on a particular age group and education level. Apart from that, we aspire to test a wider range of verbs from the same verb class in order to obtain more accurate data. Finally, we suggest a study in which more complex quantifier scope ambiguity resolution principles are taken into consideration (especially those that account for the inverse scope preference). We assume that cross-linguistic comparative research needs to be conducted between the languages where quantifier scope possibilities account for derivational analysis, as in the case of English or Russian, and non-derivational analysis, as in the case of Spanish and Brazilian Portuguese.

5. List of References

Antonyuk, S. (2015). *Quantifier scope and scope freezing in Russian* (Doctoral dissertation, State University of New York at Stony Brook).

Antonyuk, S., & Larson, R. (2016). Scope freezing in PP dative constructions. In *12th meeting of the Formal Description of Slavic Languages (FDSL), Berlin, Germany: Humboldt University*.

Antonyuk, S. (2019). Quantifier scope in Russian. *Glossa: a journal of general linguistics*, *4*(1).

Antonyuk, S. (2020). The puzzle of Russian ditransitives. *Dative constructions in Romance and beyond*, *7*, 43.

Antonyuk, S., & Mykhaylyk, R. (2022). Scope freezing and object shift in Ukrainian: Does Superiority matter?. *Syntax*, *25*(1), 122-146.

Aoun, J., & Hornstein, N. (1985). Quantifier types. *Linguistic Inquiry*, *16*(4), 623-637.

Aoun, J., & Li, Y. H. A. (1989). Scope and constituency. *Linguistic inquiry*, *20*(2), 141-172.

Arnold, J. E., & Watson, D. G. (2015). Synthesising meaning and processing approaches to prosody: Performance matters. *Language, Cognition and Neuroscience*, 30(1-2), 88-102.

Barss, A., & Lasnik, H. (1986). A note on anaphora and double objects. *Linguistic inquiry*, *17*(2), 347-354.

Beghelli, F., & Stowell, T. (1997). Distributivity and negation: The syntax of each and every. *In Ways of scope taking* (pp. 71-107). Dordrecht: Springer Netherlands.

Bobaljik, J. D., & Wurmbrand, S. (2012). Word order and scope: Transparent interfaces and the ¾ signature. *Linguistic inquiry*, *43*(3), 371-421.

Bresnan, J., & Nikitina, T. (2009). The gradience of the dative alternation. Reality exploration and discovery: Pattern interaction in language and life, 161-184.

Bruening, Benjamin. 2001. QR obeys superiority: Frozen scope and ACD. *Linguistic Inquiry 32*(2). 233–273. DOI:10.1162/00243890152001762

Bruening, B. (2014). Double object constructions and prepositional dative constructions are distinct: a reply to Ormazabal and Romero. *Linguistic Inquiry*.

Bunt, H. (2018). *Semantic annotation of quantification in natural language*. [s.n.].

Cépeda, P., & Cyrino, S. (2020). Putting objects in order: Asymmetrical relations in Spanish and Portuguese ditransitives. *Dative constructions in Romance and beyond*, *7*, 97.

Chomsky, N., Anderson, S., & Kiparsky, P. (1973). Conditions on transformations. *1973*, 232-286.

Chomsky, N. (1975). Questions of form and interpretation. *Scope of American linguistics*, 159-196.

Chomsky, N. (1981). Lectures on government and binding (dordrecht: Foris). *Studies in generative grammar*, *9*, 1995.

Dryer, M. S. (1986). Primary objects, secondary objects, and antidative. *Language*, 808-845.

Erteschik-Shir, N. (1997). *The dynamics of focus structure*. Cambridge University Press.

Erteschik-Shir, N. (2007). *Information structure: The syntax-discourse interface* (Vol. 3). OUP Oxford.

Espinal, M. T., & Villalba, X. (2015). Ambiguity resolution and information structure. *The Linguistic Review*, *32*(1), 61-85.

Fodor, J. D., & Sag, I. A. (1982). Referential and quantificational indefinites. *Linguistics and philosophy*, *5*, 355-398.

Geist, L. (2008). Specificity as referential anchoring: Evidence from Russian. *In Proceedings of Sinn und Bedeutung* (Vol. 12, pp. 151-164).

Higgins, D., & Sadock, J. M. (2003). A machine learning approach to modeling scope preferences. *Computational Linguistics*, *29*(1), 73-96.

Hornstein, N. (1999). Movement and control. *Linguistic inquiry*, *30*(1), 69-96.

Ioup, G. (1975). Some universals for quantifier scope. In *Syntax and Semantics volume 4* (pp. 37-58). Brill.

Ioup, G. (1977). Specificity and the interpretation of quantifiers. *Linguistics and Philosophy 1*, 233–245 https://doi.org/10.1007/BF00351105

Jackendoff, R. (1990) *Semantic Structures*. MIT Press. Cambridge, Massachusetts.

Jiménez-Fernández, Á. L. (2023). The heterogeneous nature of verbal alternations: What information structure can tell us about it. *Isogloss. Open Journal of Romance Linguistics*, 9 (4), 1-44.

Kayne, R. (1984). *Connectedness and binary branching*. Dordrecht: Foris. https://doi.org/ 10.1515/9783111682228

Kempson, R. M., & Cormack, A. (1981). Ambiguity and quantification. *Linguistics and Philosophy, 4*, 259-309.

Kiss, K. É., & Pafel, J. (2017). Quantifier scope ambiguities. In M. Everaert & H. C. Riemsdijk (Eds.), *The Wiley Blackwell companion to syntax* (Second ed.). John Wiley & Sons. https://doi.org/10.1002/9781118358733.wbsyncom005

Koizumi, M. (1994). Secondary predicates. *Journal of East Asian Linguistics, 3*(1), 25-79.

Kuno, S. (1991). Remarks on quantifier scope. *Current English Linguistics in Japan*, 261-287.

Kurtzman, H. S., & MacDonald, M. C. (1993). Resolution of quantifier scope ambiguities. *Cognition, 48*(3), 243-279.

Larson, R. (1988). On the double object construction. *Linguistic Inquiry 19*(3), 335–391.

Larson, R. K., Antonyuk, S., & Liu, L. (2019). Superiority and scope freezing. *Linguistic Inquiry, 50*(1), 233-252.

May, R. C. (1978). *The grammar of quantification* (Doctoral dissertation, Massachusetts Institute of Technology).

May, R. (1985). *Logical form: Its structure and derivation* (Vol. 12). MIT press.

Moulton, K. (2007). Scope relations and infinitival complements. *University of Massachusetts Occasional Papers in Linguistics, 33*(1), 8.

Radford, A. (1997). *Syntactic theory and the structure of English: A minimalist approach*. Cambridge University Press.

Reinhart, T. (1983). *Anaphora and semantic interpretation*. London: Croom Helm.

Rikardo, R., & Etxepare, R. (2021). Superiority effects without superiority conditions.

Sánchez-Calderón, S., & Fernández-Fuertes, R. (2018). “Which Came First: The Chicken or the Egg?” Ditransitive and Passive Constructions in the English Production of Simultaneous Bilingual English Children. *Atlantis, 40*(1), 39-58.

Schneider-Zioga, Patricia. 1988. *Double objects and small clauses.* unpublished manuscript, University of Southern California. Los Angeles, CA.

Szabolcsi, A. (1997). *Strategies for scope taking* (pp. 109-154). Springer Netherlands.

Titov, E. (2017). The canonical order of Russian objects. *Linguistic inquiry, 48*(3), 427-457.

Tunstall, S. L. (1998). *The interpretation of quantifiers: Semantics and processing.* University of Massachusetts Amherst.

VanLehn, K. A. (1978). Determining the scope of English quantifiers.

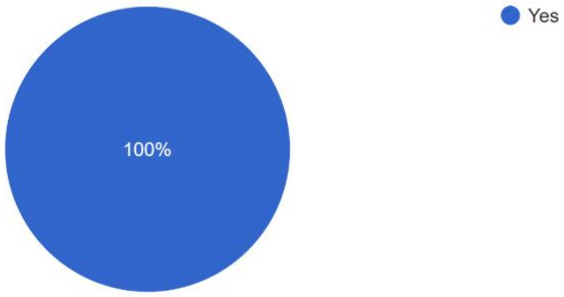
Verspoor, C. M. (1994). Double Object Constructions. *University of Melbourne. Disponível na internet em https://pdfs. semanticscholar. org/06dc/c4de6e4bbadb7272 1a3b31d67f164c49719a. pd f Acedido a, 5*(06), 2018.

Vilalta, E. (2003). The role of context in the resolution of quantifier scope ambiguities. *Journal of Semantics, 20*(2), 115-162.

Appendix 1. Questionnaire for native L1 English-speaking respondents

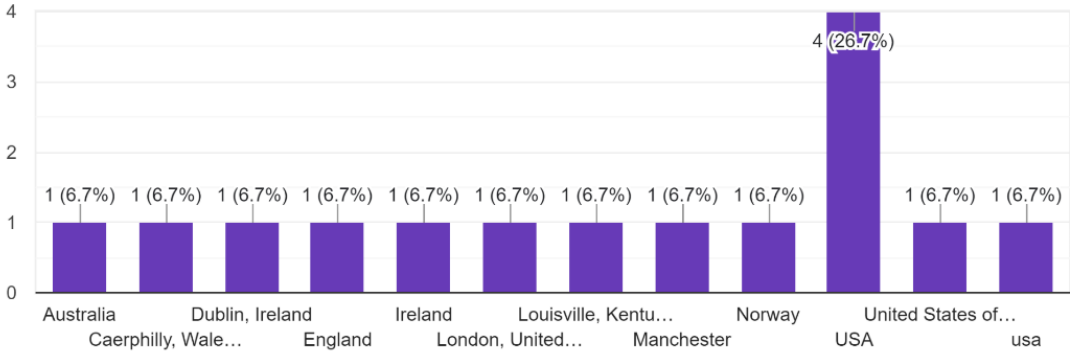
I agree to the processing of my data for academic purposes:

15 responses



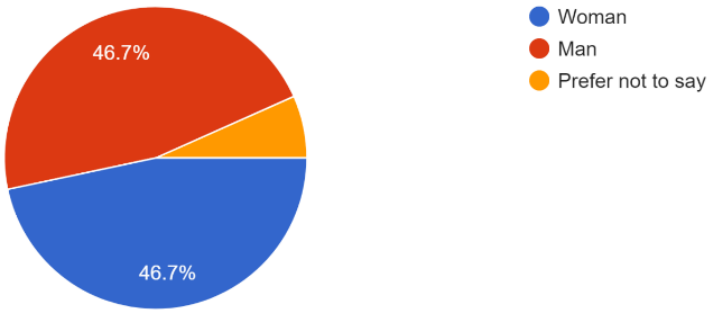
Place of residence:

15 responses



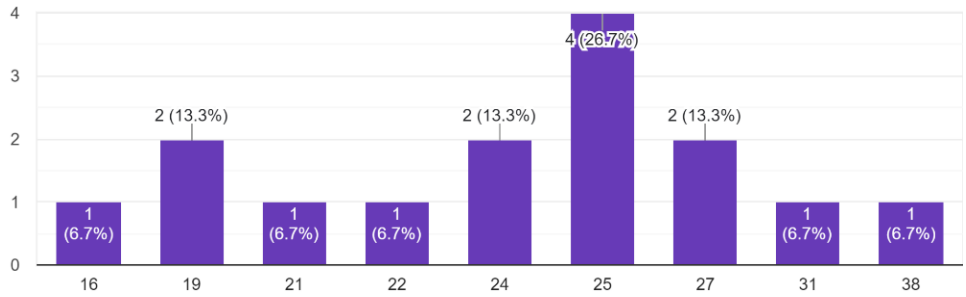
Gender

15 responses



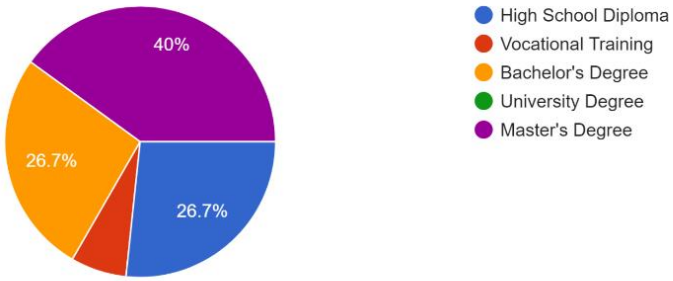
Age:

15 responses



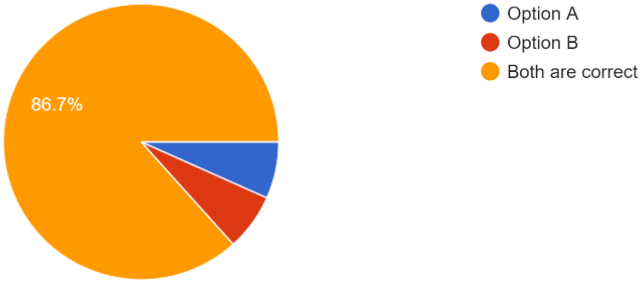
Education:

15 responses



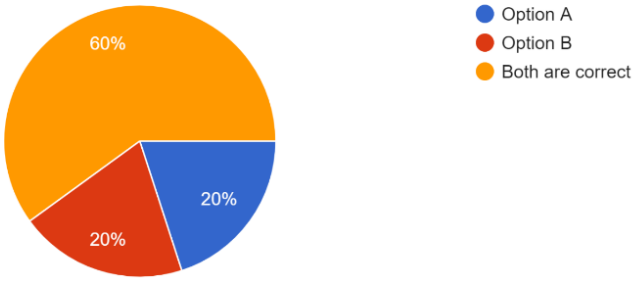
1. [Context: A delivery guy has to load some packages before shipping.] Lewis loaded a package on every van.

15 responses



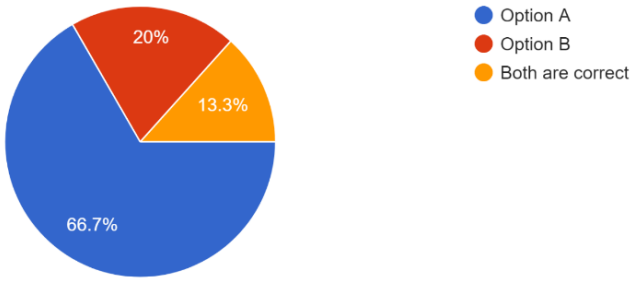
2. [Context: Today is my birthday and my brother is deciding what kind of cake I get.] My brother spread some kind of cream on each cake.

15 responses



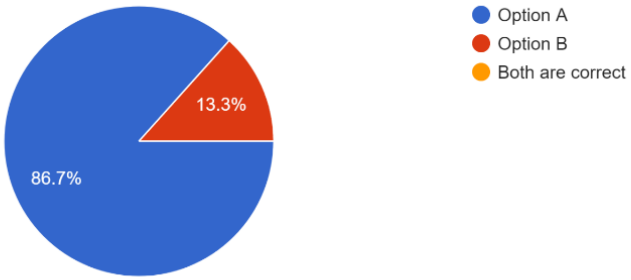
3. [Context: My grandmother has been using insecticide to kill those bugs that eat her plants.] Grandma sprayed some plant with each insecticide.

15 responses



4. [Context: A mailman delivers letters in a residential building where different neighbours live.] The mailman gave a neighbour every letter.

15 responses

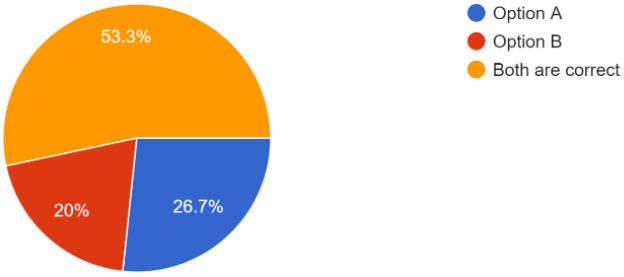


5. [Context: A kid has laid hands on some paint and is now playing in the living room.] The kid smeared some couch with every paint.

15 responses

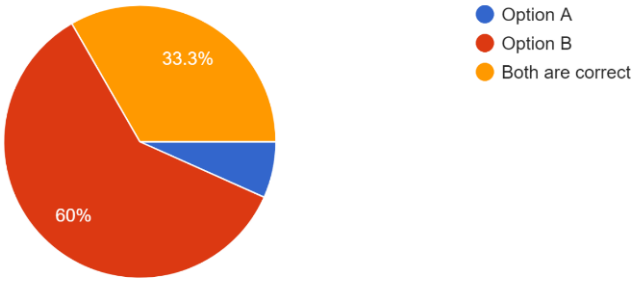
6. [Context: The chef in a restaurant is adding the last ingredients to the dishes before giving them to the guests.] The chef sprinkled a spice on every dish.

15 responses



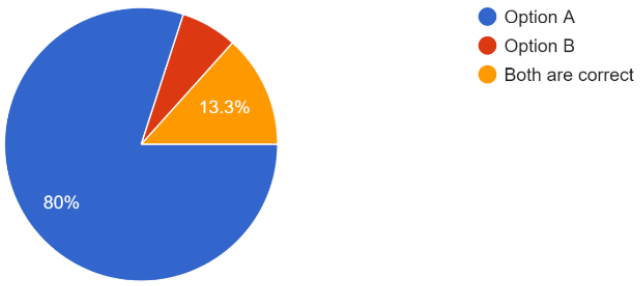
7. [Context: My grandmother has been using insecticide to kill those bugs that eat her plants.] Grandmother sprayed some insecticide on every plant.

15 responses



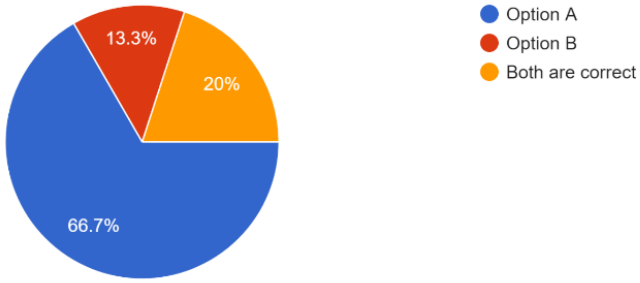
8. [Context: In a high school class, a teacher checked the students' exams]. The teacher returned a student every test.

15 responses



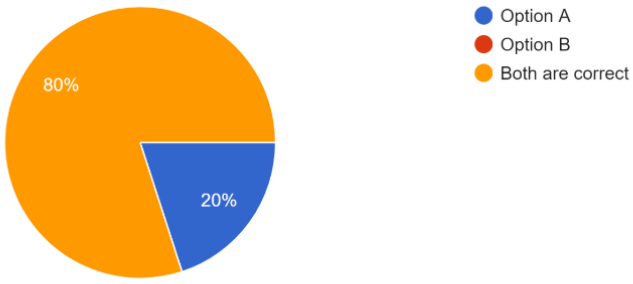
9. [Context: Today is my birthday and my brother is deciding what kind of cake I get.] My brother spread some cake with each kind of cream.

15 responses



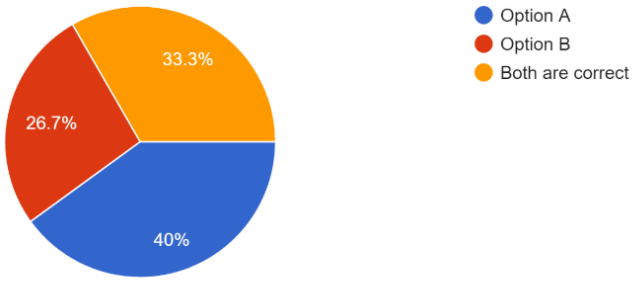
10. [Context: A kid has laid hands on some paint and is now playing in the living room.] The kid smeared some paint on every couch.

15 responses



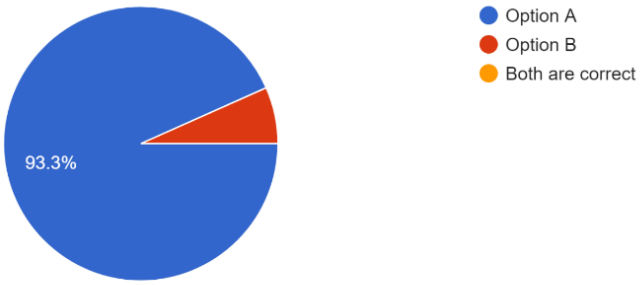
11. [Context: A mailman delivers letters in a residential building where different neighbours live.] The mailman gave every letter to a neighbour.

15 responses



12. [Context: A delivery guy has to load some packages before shipping.] Lewis loaded a van with every package.

15 responses

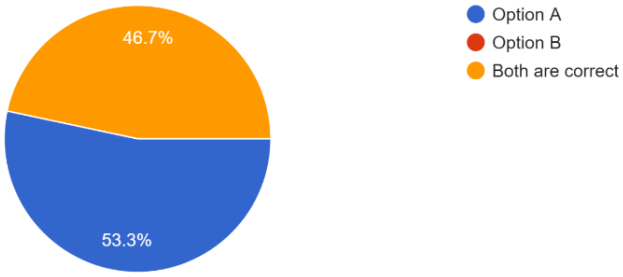


13. [Context: The chef in a restaurant is adding the last ingredients to the dishes before giving them to the guests.] The chef sprinkled a dish with every spice.

15 responses

14. [Context: In a high school class, a teacher checked the students' exams]. The teacher returned a test to every student.

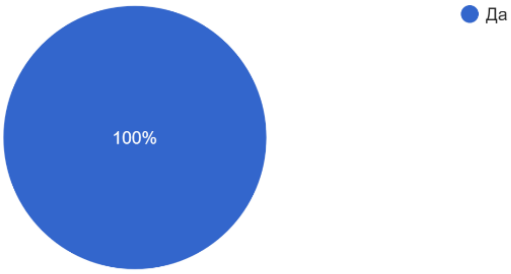
15 responses



Appendix 2. Questionnaire for native L1 Russian-speaking respondents

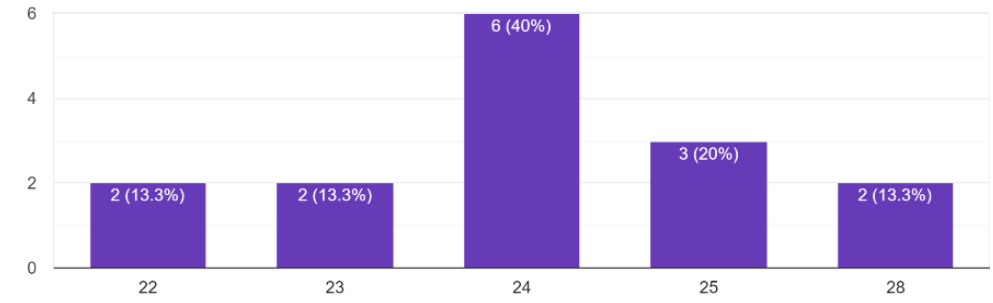
Я соглас(-ен/-на) на обработку моего ответа в научно-исследовательских целях:

15 responses



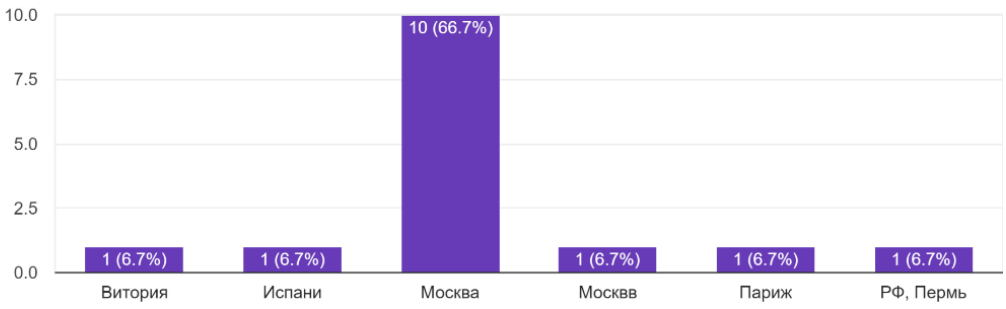
Возраст:

15 responses



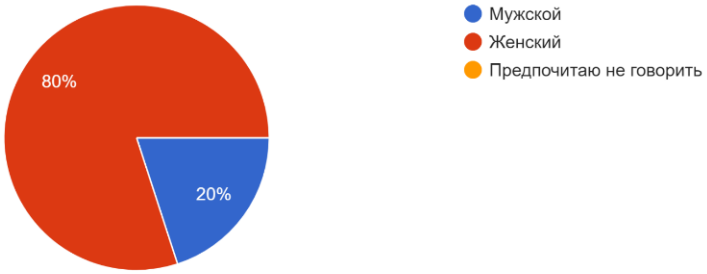
Место проживания:

15 responses



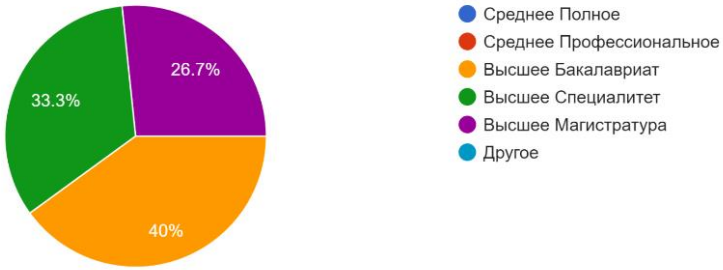
Пол:

15 responses



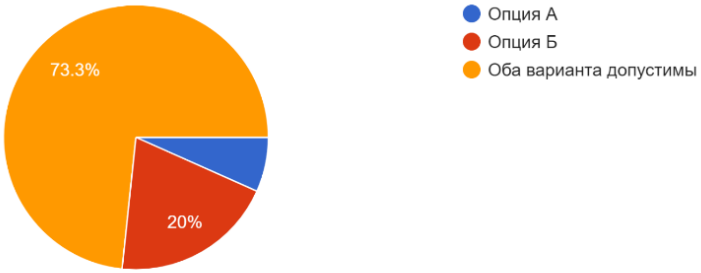
Уровень образования:

15 responses



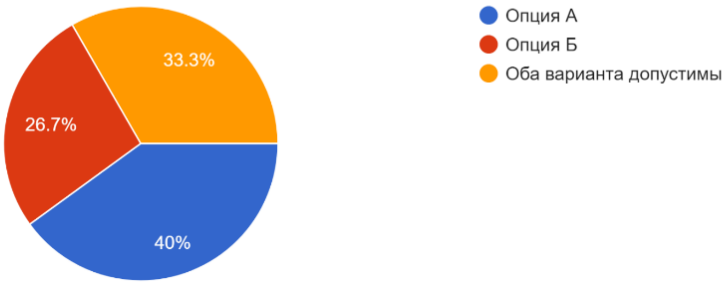
1. [Контекст: Рабочий должен погрузить товар в грузовик до доставки.] Ваня загрузил какую-то коробку в каждый грузовик.

15 responses



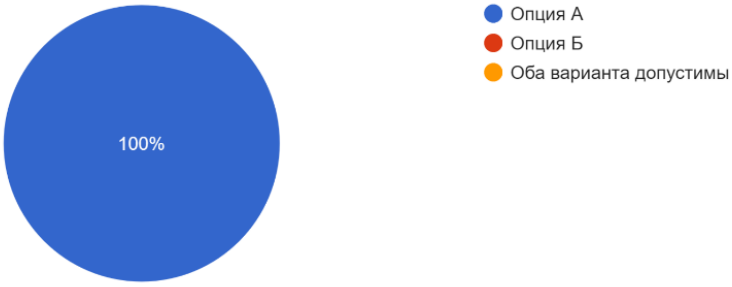
2. [Контекст: Сейчас утро, и мой брат как всегда ест тосты с маслом на завтрак.] Мой брат намазал какое-то масло на каждый тост.

15 responses



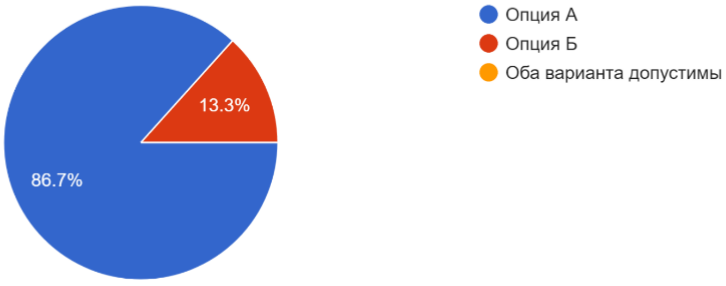
3. [Контекст: Повар завершает последние приготовления перед тем как подать еду гостям.] Повар посыпал какое-то блюдо каждой специей.

15 responses



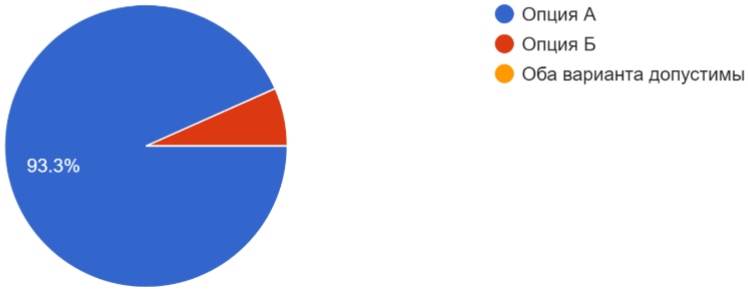
4. [Контекст: Почтальон доставляет письма в многоквартирный дом.] Почтальон передал какому-то соседу каждое письмо.

15 responses



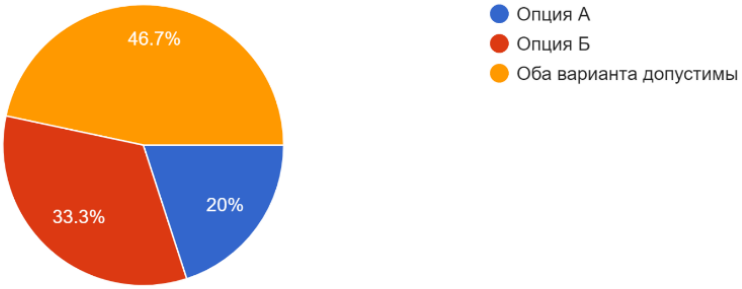
5. [Контекст: Мама готовит цветы в подарок на день учителя.] Мама повязала какой-то цветок каждой лентой.

15 responses



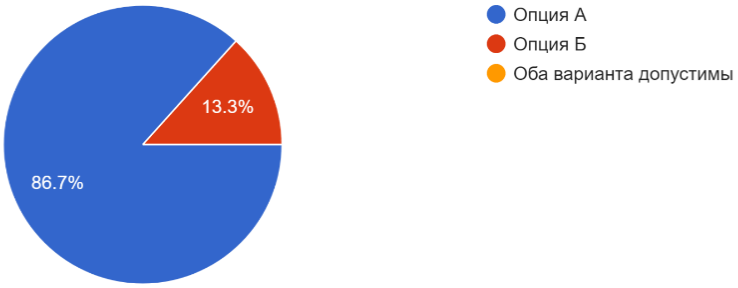
6. [Контекст: Рабочий заполняет баки на стройке.] Рабочий залил какую-то жидкость в каждый бак.

15 responses



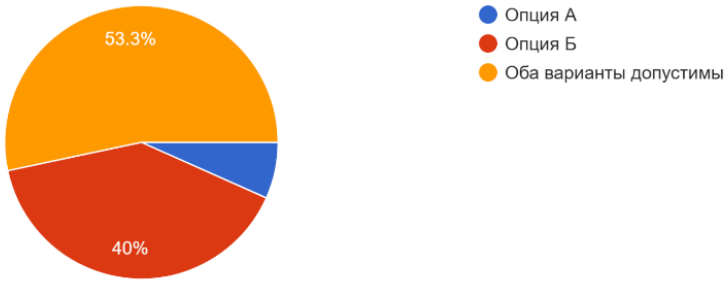
7. [Контекст: Сейчас утро, и мой брат как всегда ест тосты с маслом на завтрак.] Мой брат намазал какой-то тост каждым маслом.

15 responses



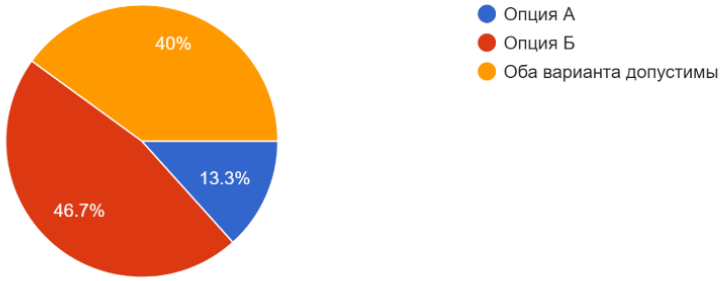
8. [Контекст: Учитель в средней школе проверяет результаты экзаменов у учащихся.] Учитель вернул какой-то тест каждому ученику.

15 responses



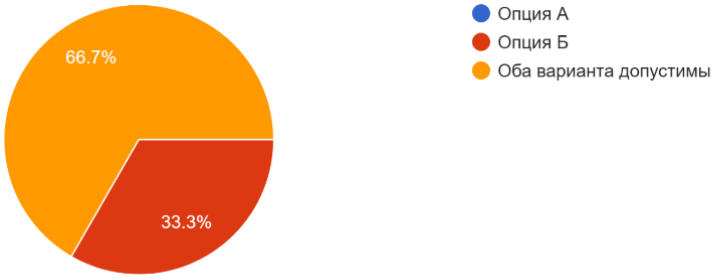
9. [Контекст: Повар завершает последние приготовления перед тем как подать еду гостям.] Повар посыпал какой-то специей каждое блюдо.

15 responses



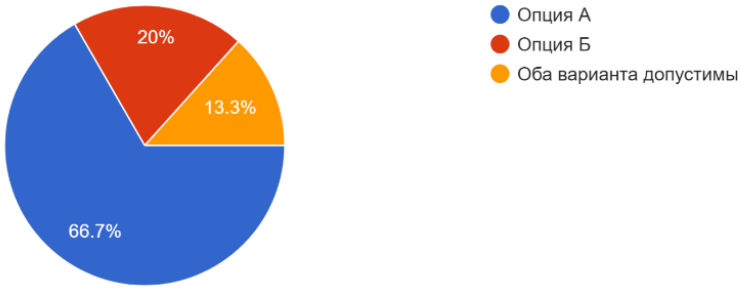
10. [Контекст: Мама готовит цветы в подарок на день учителя.] Мама повязала какой-то лентой каждый цветок.

15 responses



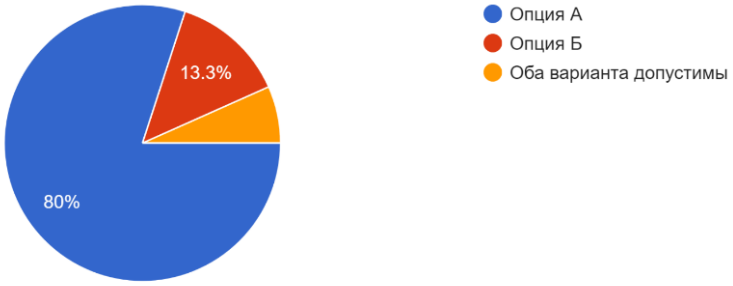
11. [Контекст: Почтальон доставляет письма в многоквартирный дом.] Почтальон передал какое-то письмо каждому соседу.

15 responses



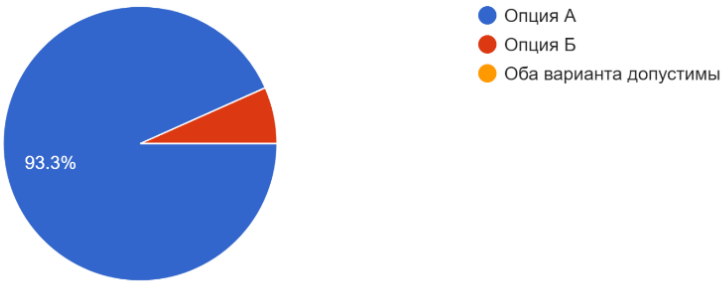
12. [Контекст: Рабочий должен погрузить товар в грузовик до доставки.] Ваня загрузил какой-то грузовик каждой коробкой.

15 responses



13. [Контекст: Рабочий заполняет баки на стройке.] Рабочий залил какой-то бак каждой жидкостью.

15 responses



14. [Контекст: Учитель в средней школе проверяет результаты экзаменов у учащихся.] Учитель вернул какому-то ученику каждый тест.

15 responses