The Locative Alternation and the Russian 'empty' prefixes: A case study of the verb gruzit' 'load'[*]

Svetlana Sokolova, Olga Lyashevskaya, and Laura A. Janda
University of Tromsø

Abstract

We present an empirical study to address two theoretical issues, both of which are controversial in the scholarly literature, namely the "Locative Alternation" and Russian aspectual "empty" prefixes. Our data, extracted from the Russian National Corpus, represent the behavior of the Russian verb *gruzit'* 'load', which participates in the Locative Alternation in both its unprefixed (*gruzit'*) and prefixed forms (*nagruzit'*, *zagruzit'* and *pogruzit'*), where the prefixes *na-*, *za-* and *po-* are traditionally considered semantically "empty", bearing only the aspectual feature "perfective". The data on the Locative Alternation was analyzed using a logistic regression model in order to probe for a significant relationship between prefixes and grammatical constructions. While the unprefixed imperfective *gruzit'* favors the Theme-Object construction, the addition of a prefix radically changes this distribution, each in a different way: *nagruzit'* strongly favors the Goal-Object construction, *zagruzit'* creates a near-balance between the two constructions, whereas *pogruzit'* uses the Theme-Object construction in a nearly exclusive manner. Our findings support the hypothesis that the Locative Alternation involves both the meaning of the verb and the meaning of its constructions. Since the three prefixed verbs exhibit statistically significant differences in their behavior, our data does not support the idea that the prefixes are semantically empty. Furthermore, our study demonstrates that a verb is not a monolithic unit, since passive participles behave differently from other verb forms. The Locative Alternation constructions can be represented by their full and reduced versions, which show a different distribution of the two constructions. In addition, we find an interesting relationship between the prefixes and the use of prepositions.

1. Introduction

We present an empirical study to address two theoretical issues, both of which are controversial in the scholarly literature. The first issue is the "Locative Alternation" (*John loaded the hay onto the truck* vs. *John loaded the truck with hay*), where an unresolved debate questions whether the most important factor is a) the meaning of the verb, b) the meaning of the construction, or c) the interaction of both the verb and its construction. Russian provides an excellent testing ground for this issue since we can observe the influence of subtle semantic modifications wrought by prefixes on constructions with overt case marking. The second issue is whether semantically "empty" linguistic units exist. Our data represent the behavior of the Russian verb *gruzit'* 'load', which participates in the Locative Alternation in both its unprefixed and prefixed forms. This verb has three purportedly "empty" prefixes according to traditional definitions, since *nagruzit'*, *zagruzit'* and *pogruzit'* are all listed as the perfective "partners" of the unprefixed imperfective *gruzit'*, and all four verbs come under a single definitional heading. Analysis of our data extracted from the Russian

National Corpus (www.ruscorpora.ru, henceforth RNC, the source of all examples herein) details the interaction of the verb and construction meanings, supporting hypothesis c) above. Furthermore, since the three prefixed verbs exhibit statistically significant differences in their behavior, our data does not support the idea that the prefixes are semantically empty. The rationale is that if the prefixes were semantically empty, they would have to be equivalent, which is not the case. We demonstrate that a verb is not a monolithic unit, since passive participles behave differently from other verb forms. The same "split" applies to the Locative Alternation constructions, which are not uniform and can be represented by their full and reduced versions, showing different behavior in terms of reduction. In addition, we find an interesting relationship between the prefixes and the use of prepositions.

Section 2 gives a brief overview of the two theoretical issues, namely the Locative Alternation in 2.1 and the so-called "empty" prefixes in 2.2, situating their relevance to Russian *gruzit'* 'load' in 2.3. Our objectives include probing the relationship between the unprefixed base verb and its three prefixed perfectives and the role of participles and prepositions in *gruzit'* 'load' constructions. Our empirical study presented in Section 3 uses the constructional profile, defined in 3.1 to structure the database, which is described in 3.2. In Section 4, the analysis confronts the objectives with the data, presenting our statistical model in 4.1, addressing the relationship between base and prefixed verbs in 4.2, the behavior of passive participles in 4.3, reduction in 4.4, and prepositions in 4.5. Conclusions are offered in Section 5.0.

2. Theoretical issues

Both the Locative Alternation and the role of prefixes in the Russian aspectual system have produced a vast scholarly literature that we cannot do justice to in this article. Our aim is to survey the highlights of both issues, picking out the points most relevant to our analysis. This entails compressing much of the detail, though this carries some risk of oversimplification.

2.1 The Locative Alternation

The Locative Alternation is famous in the scholarly literature on English from examples like these:

1) Theme-Object: *John loaded the hay onto the truck*
   vs.
2) Goal-Object: *John loaded the truck with hay*.

This phenomenon is observed in many European languages (English, German, Spanish), where a given verb can occur in two alternative constructions, both of which deliver (approximately) the same information. The Locative Alternation has attracted much attention since it touches upon "the fundamental question of why a single verb appears in more than one syntactic frame" (Iwata 2005: 356).

The Locative Alternation has been plagued by terminological diversity. Particularly problematic is the issue of what to call the two constructions, since nearly every author offers a different solution. We choose to follow Brinkmann (1997) and Nichols (2008) in terming the constructions Theme-Object and Goal-Object as above. This pair of terms makes no theoretical assumptions and is relatively transparent. The *hay* item is the theme and the *truck* item is the goal, and "object" refers to the direct object, which is consistently coded with the Accusative case in both constructions in Russian.

Most of the scholarly work on the Locative Alternation can be grouped according to the approach as:

- *Syntactic/lexical-semantic* (Rappaport & Levin 1988, 2005, 2008; Pinker 1989, Levin 1993, Brinkmann 1997; Dowty 2000; Mateu 2001);
- *Frame* (Fillmore 1968, 1977, 2008; Boas 2003, 2006; Olbishevska 2004); or
- *Constructional* (Goldberg 1995, 2006; Michaelis & Ruppenhofer 2000, 2001; Iwata 2005, 2008).

In a broad sense, all three approaches can be understood as addressing the question of what motivates the Locative Alternation: is it the verb, the construction, or both?

The syntactic/lexical-semantic approach focuses on the meaning of the verb as the crucial factor. The syntactic options are viewed as an epiphenomenon of the intrinsic properties of the verb, which can be either "content-oriented" or "container-oriented" (Pinker 1989: 125-127). The option of alternation is listed in the lexicon and follows from linking rules. The goal is thus to determine which sense is basic for each given verb. This approach runs into a variety of problems, among them the claim of derivational direction/complexity (due to the fact that the Goal-Object construction is necessarily more complex in a tree-diagram) and the related claim that one of the verb senses is more basic than the other (see Boas 2006 for an overview and counterexamples). We agree that the meaning of the verb is important, but it does not give discrete results. The syntactic/lexical-semantic approach can classify verbs as alternating or non-alternating, but does not account for distributional differences among alternating verbs. We find that alternating verbs can alternate differently, preferring either the Theme-Object or the Goal-Object construction to various extents.

The frame approach takes the syntactic construction rather than the verb as the point of departure. Boas (2006: 135) describes this as a "splitting" approach, where words are defined according to the semantic frames they evoke, and a verb like *load* is split into two lexical units, each of which evokes a distinct frame (the Theme-Object or the Goal-Object construction). Whereas the frame approach highlights the differences between the constructions, it is less effective for investigating why a single verb alternates between constructions.

The Russian data additionally present subtle semantic effects across *gruzit'* and its three perfectives: all four verbs are glossed as 'load' and claimed to have the "same" meaning. Given their "purely aspectual" relationship, these verbs are traditionally treated as a single dictionary heading. Still it appears that the prefixes must amplify different portions of the meaning of the base verb and this affects the Locative Alternation. Because we observe this tight interplay between lexical meaning and construction frequency, we choose the constructional approach. We follow Goldberg (1995, 2006) in investigating the dynamic between the Russian 'load' verbs and the Theme-Object vs. Goal-Object constructions. This approach has two added advantages for our analysis. First, the construction approach allows us to examine the interaction between the Locative Alternation constructions and another construction, namely the passive construction. Second, it allows us to zoom in on variation within the Theme-Object construction, targeting the interaction of prefixes and prepositions. Before continuing with this line of argumentation, we need to review the traditional idea of "empty" prefixes in Russian linguistics.

2.2 Russian "empty" prefixes
The category of aspect is consistently expressed by Russian verbs, which can have two values: imperfective or perfective. Janda (2007) demonstrates that it is useful to distinguish among four types of perfective verbs in Russian, two of which are

pertinent to this article, namely Natural Perfectives, which serve as the aspectual correlates of imperfective verbs with the same lexical meaning, and Specialized Perfectives that behave as separate lexical items. This distinction can be illustrated with the verb that this study focuses on: *gruzit'* 'load'. *Gruzit' - nagruzit', gruzit' - zagruzit'* and *gruzit' - pogruzit'* form aspectual pairs, where the first member is an imperfective base verb, and the second is its prefixed Natural Perfective. The meanings of both counterparts are traditionally claimed to be the "same", with the only difference being in aspect, and the verbs are listed together in a single dictionary entry (Ožegov-Švedova 2001). Unlike *peregruzit'* 'overload; transport by ship' and *dogruzit'* 'finish loading', which serve as Specialized Perfectives to the base verb *gruzit'* and involve prefixes that bring new, additional meaning to the imperfective, the Natural Perfectives give an impression that their prefix bears no meaning and thus can be treated as "empty".

Specialized perfectives can form their own aspectual correlates by means of the suffixes *–yva-/-iva-*, *-va-* and *–a-* (*peregruzit' – peregružat'* 'overload; transport by ship'). Thus, Russian has two major types of aspectual pairs: 1) unprefixed imperfective verbs and their Natural perfectives, and 2) Specialized perfectives and their suffixal imperfective counterparts. However, this system is further complicated by the fact that many Natural Perfectives can also form suffixal imperfectives, which is also true for the verbs under consideration: *nagruzit' - nagružat', zagruzit' - zagružat', pogruzit' - pogružat'*. Functionally, there is no one-to-one correspondence between primary imperfectives like *gruzit'* and secondary imperfectives like *nagružat'*. The relation between the two types of imperfectives is a separate and complex issue in Russian linguistics and depends on many factors. Secondary imperfectives favor habitual and iterative contexts more than primary imperfectives (see Apresjan 1995, Petruxina 2000), and secondary imperfectives are more strongly associated with praesens historicum (Xrakovskij 2005) and are more often used in metaphorical contexts (Veyrenc 1980). Secondary imperfectives reflect not only the interaction of the verbal stem and the perfectivizing prefix, but also involve one more factor, i.e. the imperfectivizing suffix. In this work we are mostly interested in "empty" prefixes, which leaves secondary imperfectives outside the scope of this study.

The idea of "empty" prefixes, also known as "purely aspectual" ("čistovidovyje"), has a long tradition in Russian linguistics (Šaxmatov 1952; Avilova 1959, 1976; Tixonov 1964, 1998; Forsyth 1970; Vinogradov 1972; Švedova et al. 1980; Čertkova 1996; Zaliznjak & Šmelev 2000; Mironova 2004). The list of "pure aspectual" pairs varies in grammars and dictionaries, but, according to the "Exploring Emptiness" database (description of the database is available in Janda & Nesset forthcoming), there are up to two thousand such pairs used in contemporary Russian. The inventory of "empty" prefixes ranges from sixteen (Švedova et al. 1980) to nineteen items (Krongauz 1998). A noticeable fact about "empty" prefixes is that all these units also form Specialized Perfectives. Usually each base verb chooses one "empty" prefix, but many verbs can occur with two or three prefixes (as in case of *gruzit'*); the maximum appears to be six prefixes (see the description of *mazat'* 'smear' in section 2.3).

Some scholars have objected to the concept of "empty" prefixes, claiming that the prefix always retains its meaning (Vey 1952, van Schooneveld 1958, Isačenko 1960, Timberlake 2004: 410-411). Most traditional descriptions of Russian grammar do not mention the fact that some imperfectives form Natural Perfectives with more than one prefix. Those that do note that Natural Perfectives with various prefixes can

be slightly differentiated in lexical meaning (Švedova et al. 1980: 588, Čertkova 1996, Glovinskaja 1982), but do not give further information. We join the camp of opponents of the "meaningless" approach and seek to provide new corpus-based evidence that the prefix of a Natural Perfective has semantic content, and, being compatible with the semantics of the base verb, it enhances or focuses certain portions of the latter.

Janda & Nesset (forthcoming) offer two sets of arguments against the "emptiness" of the prefixes. First we see an uneven distribution of prefixes within the class of Natural Perfectives. If the meanings of the prefixes were really empty, we could expect an arbitrary statistical distribution of verbs to prefixes, which is not the case. Second, there is a remarkable isomorphism between the semantic network of Specialized Perfectives that involve "non-empty" uses of a prefix and the semantic network of Natural Perfectives that use the same prefix in an "empty" mode. This suggests that prefixes always remain connected to their meanings, which overlap with the meanings of the verbs in the Natural Perfectives. The present article provides new evidence against the "empty" prefixes. We demonstrate that the choice of prefix for Natural Perfectives in case of *gruzit'* (*na-* vs. *za-* vs. *po-*) influences the constructional profile of the verb as it is attested in corpus data.

2.3 Interaction of Locative Alternation and prefixes in Russian
The Locative Alternation is represented by two constructions: Theme-Object and Goal-Object. As noted above, the two constructions differ in which of the participants is marked as the direct object: the theme (i.e. elements like *hay*), or the goal (i.e. elements like *truck*). In both constructions the direct object is consistently coded in Russian with the Accusative case, while the other participant can be expressed via different forms.

The Theme-Object construction encodes the goal via a prepositional phrase (usually with prepositions *v* 'into' and *na* 'onto') with a noun in the Accusative case,[1] as illustrated in examples 3) and 4).

3) *Potom s pomošč'ju avtokrana predpolagalos' gruzit'* <u>*brevna*</u> <u>*na baržu*</u>.
[Then with help-INST crane-GEN was-supposed load-INF <u>logs-ACC</u> <u>on barge-ACC</u>.]
'Then, with the help of the crane, we were supposed to load <u>the logs</u> <u>onto the barge</u>.'

4) *Gruzi* <u>*vse*</u> <u>*v mašinu*</u> *i vezi sjuda.*
[Load-IMP <u>everything-ACC</u> <u>into car-ACC</u> and bring-IMP here.]
'Load <u>everything</u> <u>into the car</u> and bring [it] over here.'

In the Goal-Object construction the other participant is coded by the Instrumental case without a preposition:

5) *On sodrogalsja, slušaja o tom, kak gruzili* <u>*vagony*</u> <u>*detskimi trupami*</u>.
[He shuddered hearing about how they loaded <u>wagons-ACC</u> <u>childrens'-INST corpses-INST</u>]
'He shuddered hearing about how they loaded <u>wagons</u> <u>with childrens' corpses</u>'

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[1] Alternatively adverbs like *kuda* 'in which direction' can appear in this slot of the Theme-Object construction, in which case the goal is not explicitly named.

The use of prefixes in Russian presents a challenge for research on the Locative Alternation in that it introduces a more complicated system of alternating verbs. Considering the interaction between prefixes and locative constructions, three groups of alternating verbs can be singled out:

a) verbs that can alternate in both unprefixed and prefixed forms (verbs like *gruzit'* 'load');

b) verbs that do not alternate when unprefixed but are used in both constructions with certain prefixes (verbs like *lit'* 'pour', and *sypat'* 'strew, scatter');

c) verbs that do not alternate in unprefixed forms and can be used either in Theme-Object or Goal-Object construction depending on the prefix (verbs like *stavit* 'put, place').

The last group is not in our focus since it includes Specialized Perfectives, which are semantically distinct from the imperfective base verb. Hence in this case there is no Locative Alternation as such. For instance, the unprefixed verb *stavit* 'put, place', as well as its Natural Perfective with *po-* (*postavit'*), are used in Theme-Object construction while its Specialized Perfectives with *za-* and *ob-* choose the Goal-Object construction (*zastavit* 'line something with something'; *obstavit* 'furnish').

In group (b) we find Locative Alternation only with a prefix (usually *za-*): cf. the verb *lit'* 'pour', which is used only in the Theme-Object construction, and its Specialized Perfective *zalit'* 'fill', which shows the Locative Alternation (*zalit' benzin*-ACC *v bak*-ACC 'pour gasoline into the tank'; *zalit' bak*-ACC *benzinom*-INST 'fill the tank with gasoline'). It appears that in this case the properties of the prefix are more at stake than the properties of the verbal roots. As well as in group (c), the prefixed verbs of this group are Specialized pefectives and thus go beyond the scope of this article. (For a more detailed consideration of this group see Sokolova & Lewandowski forthcoming.)

Our main interest is in the first group of verbs, which alternate in both unprefixed and prefixed forms. This group is limited in Russian to two sets of verbs: *gruzit'* 'load' and *mazat'* 'smear' and their Natural Perfectives. The verb *gruzit'* has three perfective counterparts, with the prefixes *na-*, *za-*, *po-*, all of which can alternate. The verb *mazat'* 'smear' has six Natural Perfectives, with the prefixes *na-*, *za-*, *po-*, *vy-*, *iz-*, *pro-*, of which only *namazat'* alternates (with a strong preference for the Goal-Object construction).[2] Thus, *gruzit'* 'load' is the only base verb with more or less even distribution for the Theme-Object and the Goal-Object constructions, where the Natural Perfectives *nagruzit'*, *zagruzit'* and *pogruzit'* can also alternate. Hence it is the behavior of these verbs that we analyze in this article.

3. Data and methodology

Our empirical study examines the constructional profiles of the Russian 'load' verbs as evidenced by data from the Russian National Corpus. We first define the term "constructional profile" and then describe how our data was extracted and coded.

3.1 Constructional profiles

Constructional profiles have proven to be an effective method for investigating the synonymy of words, as Janda & Solovyev (2009: 367) demonstrate in their study of

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[2] It appears that in the case of *mazat'* 'smear' the properties of the verbal root are more at stake than the properties of the prefixes since the verbal root itself already contains some information about the theme as a substance (note the null-suffixed deverbal noun *maz'* 'grease'; cf. verbs with incorporated participants like *saxarit'* 'sugar' derived from *saxar* 'sugar' and *musorit'* 'litter' derived from *musor* 'litter', see Jackendoff 1990; Padučeva 2008: 233-234).

Russian words for 'happiness' and 'sadness', where they define the constructional profile of a word as "the frequency distribution of the constructions that a word appears in". This frequency distribution is based on corpus data.

The constructional profile methodology has grown directly out of the cognitive linguistics tradition, more specifically construction grammar, and has close relatives both within that tradition and beyond it. In keeping with construction grammar, constructional profiling recognizes the construction as the relevant unit of linguistic analysis (Goldberg 1995, 2006) and presumes that speakers are sensitive to the frequency of words in constructions (Goldberg 2006: 46, 62). Both Geeraerts (1988) and Divjak & Gries (Divjak 2006, Divjak & Gries 2006 and Gries & Divjak 2009) have used corpus data to investigate synonymy, using a wide range of factors (collocational, morphosyntactic, syntactic, and semantic) in order to establish behavioral profiles of verbs. Constructional profiles utilize only the complementation patterning aspect of behavioral profiles, specifically targeting the range of constructions a word appears in. Since the constructional profile methodology takes the word as the point of departure, it is in a sense the inverse of the collostructional methodology (Stefanowitsch & Gries 2003, 2005), which takes the construction as the point of the departure and asks what words occur in the construction. Beyond the immediate family of methodologies within cognitive linguistics, constructional profiles are also related to techniques such as syntactic bootstrapping (Gleitman & Gillette 1995, Lidz et al. 2001) and the use of syntactic range information (Atkins et al. 2003).

The four Russian 'load' verbs present the closest kind of synonymy, since they are united in a single dictionary heading, and it is not even clear whether they are separate words at all. Our analysis shows that constructional profiles can distinguish even among these nearest of synonyms.

3.2 Database

According to two dictionaries (Evgen'eva 1999 and Ožegov & Švedova 2001) and a list (Cubberly 1982), the Natural Perfectives of *gruzit'* 'load' include the three prefixed verbs *nagruzit'*, *zagruzit'* and *pogruzit'*. For the purpose of this study, we constructed a database based on the Modern subcorpus (1950-2009) of the RNC, which contains 98 million words. We extracted examples from this subcorpus for each of the four verbs (the base verb and its Natural Perfectives).[3] The same procedure was performed for all verb forms and in addition passive participles received a separate mark.

Passive participles represent an interaction between the Locative Alternation constructions and the passive construction, and this interaction has a significant impact on the distribution of the Locative Alternation constructions. The Locative Alternation involves two objects, Theme and Goal, both of which can be in focus. The passive construction restricts the focus to just one participant. Where non-passive forms show a preference for one construction over the other, this preference is further exaggerated in the presence of passive forms (see Section 4.2). Thus, for the purpose of this study we have treated passive participles as a separate factor. This yields 895 non-passive forms and 1025 passive forms, for a grand total of 1920 examples. Table 1 shows the frequencies of these examples broken down according to verbs.

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[3] To exclude the author as one more relevant factor, the database was cleaned so that there is only one example for each verb from any single author.

All non-passive forms	raw frequency	Passive participles	raw frequency
gruzit'	286	*gružen*	107
nagruzit'	147	*nagružen*	221
zagruzit'	208	*zagružen*	248
pogruzit'	254	*pogružen*	449

Table 1: Raw frequencies for the forms of the verb *gruzit'* 'load' and its Natural Perfectives.

The examples thus accumulated were manually coded for the Locative Alternation constructions as Theme-Object vs. Goal-Object. The breakdown and analysis of these data are presented in 4.2 for the non-passive forms and in 4.3 for the passive forms.

In addition to analyzing the interaction between prefixes and constructions within non-passive and passive forms of the four 'load' verbs, we are also taking into account the subtype of the construction, namely whether the construction is represented by its "full" or "reduced" version. In full constructions, both participants (Theme and Goal) are overtly expressed, while in "reduced" constructions, one of the participants is missing. "Reduction" here refers to the omission of one of the arguments, which is not profiled as a direct object. For the Theme-Object construction this is the case when the Goal is omitted, whereas the Goal-Object construction leaves out the Theme. In most cases with an omitted Theme or Goal argument, the missing participant is perceived from the context, as in examples 6) and 7) given below:

6) *No uže v bližajšee vremja ožidaetsja podxod sudov obščim tonnažem 780 tys. tonn. Tol'ko zagruzit' ugol' budet problematično, poskol'ku iz-za moroza on prevratilsja v glyby.*
[But already in nearest time is-expected arrival of vessels (Goal that is omitted in the following sentence) with total tonnage 780 thousand tonnes. Just load coal-ACC will-be problematic, since due-to frost-GEN it-NOM turned-into into blocks-ACC.]
'But already very soon we expect the arrival of vessels with total tonnage of 780 thousand tons. Just getting the coal loaded will be problematic since due to the cold it has turned into blocks.'

7) *Nikolaj ... očen' skoro upravilsja s pokupkami, nagruzil podvody i, poka mužiki kormili lošadej, otpravilsja slonjat'sja po rjadam.*
[Nikolaj ... was very soon done with purchases (Theme that is omitted in the following phrase), loaded wagon-ACC and while men were feeding horses he went slouching about rows]
'Nikolaj ... was very soon done with the purchases, loaded the wagon and while the men were feeding the horses he went slouching about the rows.'

Example 6) illustrates a Theme-Object construction with a missing Goal (the vessels that are mentioned in the previous sentence, where the coal will be loaded), and example 7) illustrates a Goal-Object construction with a missing Theme (the purchases that the wagon is loaded with).[4] Reduced constructions are analyzed in section 4.4.

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[4] There were five examples where both the theme and goal were missing, and since in such examples it is not always possible to determine which construction is present, these examples were eliminated from

4. Analysis of the Locative Alternation

This study contributes to the ongoing linguistic discussion of what motivates the Locative Alternation by investigating the interaction between the prefixes and the grammatical constructions. First, we look at the relationship between the unprefixed base verb (*gruzit'* 'load') and its prefixed perfective counterparts (*nagruzit', zagruzit', pogruzit'*) to see what the prefixes contribute to the properties of the verbal root. Furthermore, we address an issue which so far has not received proper attention in scholarly works on the Locative Alternation, i.e. the situation with passive participles which change the focus of the locative construction by placing one of the participants (the agent) off-stage. We show that the distribution of the passive participles between the two constructions represents an interaction between the Locative Alternation constructions and the passive construction. Another issue in focus are reduced constructions, where one of the participants is missing. We show that the two constructions behave differently in terms of reduction. Finally, we zoom in on variation within the Theme-Object construction, revealing the interaction of prefixes and prepositions. The data show that the prefix *na-* targets the preposition *na* 'onto' while other prefixes favor the preposition *v* 'into'.

4.1. Binary regression model

The data on the Locative Alternation was analyzed using a logistic regression model in order to probe for a significant relationship between prefixes and grammatical constructions. All calculations were carried out using the "R" software package (http://cran.at.r-project.org), glm, lrm and anova functions (this strategy is modeled after Baayen 2008, Gries 2009[5]).

Our hypothesis that underlies the model is that three factors, namely (1) prefixes, (2) the number of participants in a frame and (3) the finite/participle form of a verb (as well as their interaction) contribute to the choice of either the Theme-Object or the Goal-Object construction. Thus, there are three independent nominal variables in the model:

(1) VERB, having four levels: "Ø" ("zero" for *gruzit'*), "na" (for *nagruzit'*), "za" (for *zaruzit'*) and "po" (for *pogruzit'*);

(2) REDUCED, having two levels: "yes" (for the reduced constructions, where one of the participants is missing) and "no";

(3) PARTICIPLE, also having two levels: "yes" and "no".

One dependent nominal variable CONSTRUCTION has two levels: "theme" and "goal". The null hypothesis, H_0, suggests that the frequencies of the Theme-Object or the Goal-Object constructions are independent of the VERB, REDUCED, PARTICIPLE variables and their pairwise interactions.

The minimal adequate model retains all the independent variables as main effects, plus the interaction between VERB and PARTICIPLE. As shown below, the unprefixed verb *gruzit'* and its Natural perfective *pogruzit'* favor the Theme-Object construction, while *nagruzit'* and *zagruzit'* prefer the Goal-Object construction. The statistical test also detected that passive participles contribute to the choice of the construction. Finally, reduced frames favor the Goal-Object construction while full frames are used mainly in the Theme-Object construction.

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further analysis and do not figure in our database. All five examples involved the unprefixed *gruzit'* 'load'.

[5] The authors are indebted to an anonymous reviewer for suggesting the use of this method with our data.

Logistic regression shows that there is a highly significant correlation between the factors mentioned above and the choice of construction: LL-ratio χ^2 is 1738.47, Nagelkerke's *R2* is 0.796, *C* value (which according to Gries 2009 should ideally be .8 or higher) is 0.964, Somer's D_{xy} = 0.928, *df* = 8, overall *p* is 0. The optimal model has high classificatory power: 88.5 % constructions are predicted correctly.

The odds ratio, 95%-CI and *p* for the significant predictors VERB, REDUCED, PARTICIPLE, and VERB:PARTICIPLE are shown in Table 2:

Variable	Odds ratio	95%-Confidence Interval		p-value	
VERBna	0.097	5.928746e-02	1.549363e-01	< 2e-16	***
VERBpo	79.888	1.744470e+01	1.416632e+03	1.49e-05	***
VERBza	0.289	1.951300e-01	4.245384e-01	3.68e-10	***
REDUCEDyes	0.411	2.907612e-01	5.773928e-01	3.67e-07	***
PARTICIPLEyes	0.003	1.450705e-04	1.203072e-02	4.66e-09	***
VERB na:PARTICIPLEyes	5.881	2.244183e-01	1.541567e+02	0.219043	ns
VERB po:PARTICIPLEyes	289.170	9.203405e+00	9.763774e+03	0.000373	***
VERB za:PARTICIPLEyes	24.057	4.314377e+00	4.521877e+02	0.003034	**

Table 2: Statistical significance of the independent variables and their interactions.

In the next few sections we discuss each factor in more detail.

4.2. The verb *gruzit'* 'load' and its Natural Perfectives
Table 3 shows the distribution of the non-passive forms of *gruzit'* 'load' and its Natural Perfectives across the two constructions of the Locative Alternation. Figure 1 presents the same distribution graphically in terms of relative frequency.

	Theme-Object constructions		Goal-Object constructions		Total
	raw frequency	relative frequency	raw frequency	relative frequency	
gruzit'	208	72.73%	78	27.27%	286
nagruzit'	34	23.13%	113	76.87%	147
zagruzit'	94	45.19%	114	54.81%	208
pogruzit'	253	99.61%	1	0.39%	254

Table 3: Locative Alternation among non-passive forms of *gruzit'* 'load' and its Natural Perfectives
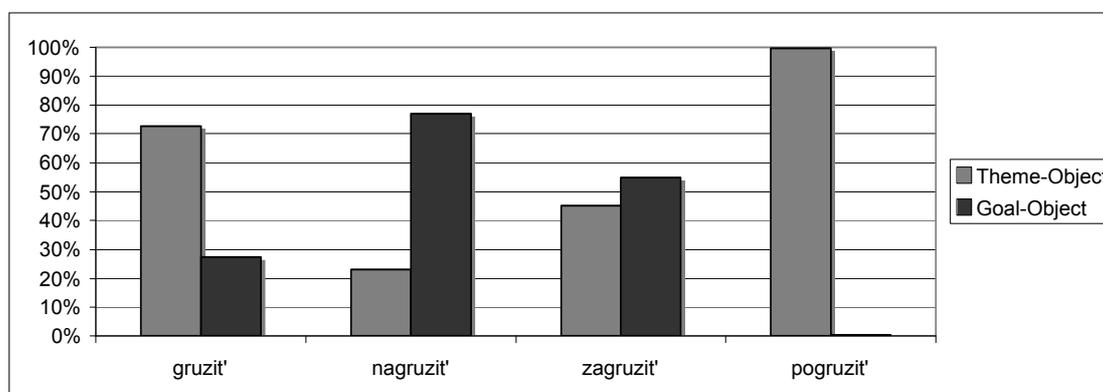

Figure 1: Locative Alternation among non-passive forms of *gruzit'* 'load' and its Natural Perfectives

According to our model, the variable VERB has a strong effect ($\chi^2 = 341.52$, $p < 2.2$e-1). On Figure 1, we see clear differences among the four 'load' verbs. The base imperfective *gruzit'* strongly prefers the Theme-Object construction. The *na-* prefixed perfective is nearly the mirror image, preferring the Goal-Object construction. This preference of *nagruzit'* for focusing on the goal may have to do with the SURFACE meaning of *na-*, which corresponds to the meaning of the corresponding preposition *na* 'onto' (which this verb also shows a strong predilection for, see section 4.3). *Zagruzit'* shows an almost even distribution across the two constructions, whereas *pogruzit'* is almost exclusively restricted to the Theme-Object construction, suggesting a focus on the Theme that is loaded rather than the place where the load ends up.

Given that the perfective verb *pogruzit'* shows the same focus (i.e. on the Theme) as the unprefixed verb *gruzit'*, *pogruzit'* might seem to be the most natural perfective counterpart of *gruzit'*. However, the fact that the Goal-Object construction constitutes 27% of the total number of uses of *gruzit'* prevents us from making such conclusions. *Pogruzit'* is a natural perfective counterpart of *gruzit'* but only for the Theme-Object construction. Moreover, *gruzit'* and *pogruzit'* behave differently in terms of grammatical forms and reduction (see sections 4.3 and 4.4).

This finding is striking given the fact that the four verbs are typically listed under a single dictionary heading, and all three perfectives are traditionally considered to bear semantically "empty" prefixes. If the three prefixes were indeed empty, we would expect no effect, or at the very least, an identical effect across the three perfectives. Here, instead, we find that the three prefixed verbs behave very differently both from the unprefixed imperfective and from each other. We take this as strong evidence against the traditional "empty" prefix hypothesis, since a zero should have no effect, and we cannot countenance three "different" zeroes. As we see below in 4.3, the trends that are evident in the prefixed non-passive forms are even more pronounced in the passive forms.

4.3 Passive participles
Passive participles are of course used in passive constructions, and here we see an interaction between the two Locative Alternation constructions and the passive construction, as illustrated in examples 8) and 9). The Theme-Object construction has the Theme as the grammatical subject (8), whereas the Goal-Object construction has the Goal as the grammatical subject (9). Whichever item is the grammatical subject is thus strongly profiled, and the agent can be omitted altogether, as we see in both examples.

8) *K dvum časam <u>vse vešči</u> byli vyneseny na ulicu i pogruženy <u>v avtomobil'</u>.*
[Toward two hours-DAT <u>all things-NOM</u> were carried onto street-ACC and loaded <u>into automobile-ACC</u>.]
'Towards two o'clock <u>all the things</u> were carried out into the street and loaded <u>into the automobile</u>.'

9) *<u>Pervyj tanker</u> byl zagružen v prisutstvii prezidentov Putina i Nazarbaeva.*
[<u>First tanker-NOM</u> was loaded in presence-LOC presidents Putin and Nazarbaev-GEN.]
'<u>The first tanker</u> was loaded in the presence of presidents Putin and Nazarbaev.'

Table 4 provides the Locative Alternation data for the passive participles of the 'load' verbs. Figure 2 visually presents the same data together with the relative frequencies of non-passive forms for comparison.

	Theme-Object constructions		Goal-Object constructions		Total
	raw frequency	relative frequency	raw frequency	relative frequency	
gružen	1	0.93%	106	99.07%	107
nagružen	1	0.45%	220	99.55%	221
zagružen	11	4.44%	237	95.56%	248
pogružen	447	99.55%	2	0.45%	449

Table 4: Locative Alternation among passive forms of *gruzit'* 'load' and its Natural Perfectives.
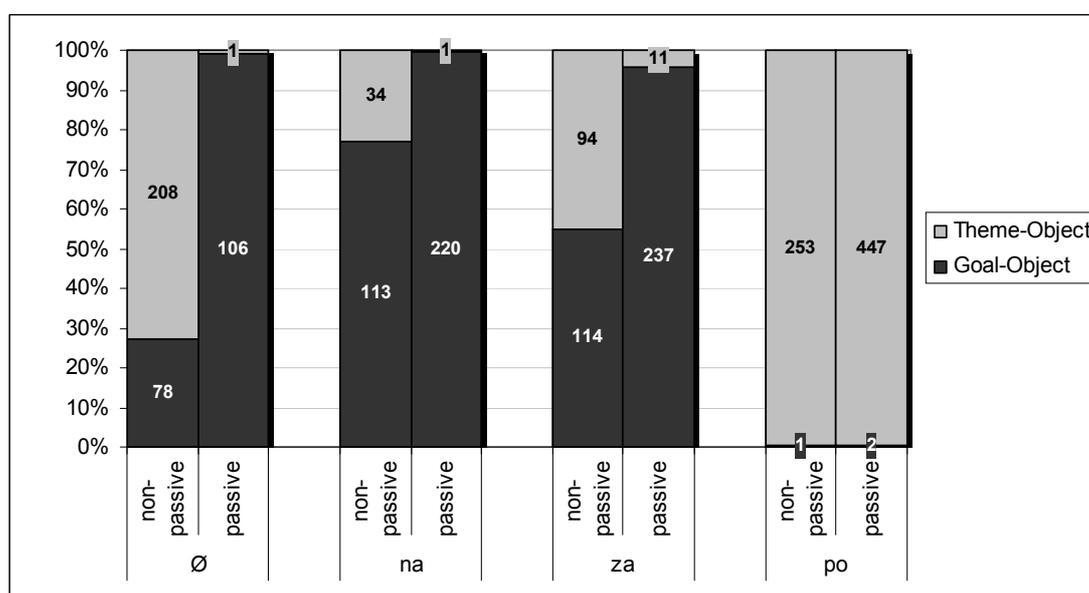

Figure 2: Locative Alternation among non-passive and passive forms of *gruzit'* 'load' and its Natural Perfectives.

Whereas *pogružen* retains its nearly exclusive preference for the Theme-Object construction, all other passive participles have a nearly exclusive preference for the Goal-Object construction. If we look at Figure 2, it may appear that the participles *gružen*, *nagružen*, *zagružen* behave virtually identically. However, they take different objects for the Theme and the Goal and also show different metaphorical representations. For instance, if we compare the metaphorical use of the participles *gružen*, *nagružen*, *zagružen* we find that *gružen* is hardly ever used metaphorically (2 examples out of 107, about 2%), for *nagružen* metaphorical contexts constitute about 22% (48 out of 221 total), while *zagružen* is characterized by almost 80% metaphorical contexts (176 out of 248).

Not only do participles with different prefixes show different distribution of metaphorical expressions but also the Theme and the Goal in those expressions are represented diffently. One of the most frequent Theme+Goal combinations for *zagružen* is WORK+HUMAN, where the human being serves as a metaphorical CONTAINER for work that represents metaphorical CONTENTS (example 10):

10) *Vsju nedelju Ilja byl zagružen delami*
[All week <u>Ilja-NOM</u> was loaded <u>works-INS</u>]
'The whole week <u>Ilja</u> was overloaded <u>with work</u>'

Such contexts exclude the use of *nagružen* (no such examples were attested in the corpus). On the other hand, only the participle *nagružen* can refer to WORDS as a metaphorical CONTAINER and MEANING as their metaphorical CONTENTS (example 11).

11) *V russkom jazyke nekotorye slova nagruženy negativnym smyslom*
[In Russian language <u>some words-NOM</u> are loaded <u>negative meaning-INS</u>]
'In Russian <u>some words</u> are loaded <u>with negative meaning</u>'

The PARTICIPLE variable demonstrates a significant effect ($\chi^2 = 217.58$, $p < 2.2e-1$) and at least part of the interaction between VERB and PARTICIPLE is significant as well ($\chi^2 = 21.5$, $p = 8.284e-05$, see also Table 2). Our analysis shows that the overall distribution of various constructions within each verb is also dependent on the distribution of grammatical forms within this verb. The frequency of the grammatical form (in our case of the passive participles) is dependent on the verb (for more details see Janda & Lyashevskaya forthcoming). Some of our verbs show a higher relative frequency of passive participles: for instance, the proportion of non-passive forms to passive forms for the unprefixed verb *gruzit'* is almost 3:1 (286 vs. 107 examples); the verbs *nagruzit'* and *zagruzit'* show an almost even distribution of non-passive and passive forms (1:1.5 and 1:1.2 respectively), while the proportion of the same forms for the verb *pogruzit'* is 1:2 (254 vs. 449 examples).

As can be seen from Figure 2, passive participles have the effect of increasing the relative frequency of the construction that is associated with a given verb. For instance, the distribution of the Theme-Object and Goal-Object constructions with non-passive forms of the verb *nagruzit'* is 23% vs. 77%. For passive forms, the same proportion is 0.5% to 99.5%, significantly increasing the number of examples with the Goal-Object construction. The same effect is attested for the verb *zagruzit'*: the non-passive and passive forms are characterized by a relatively even distribution between the constructions (45% of the Theme-Object constructions vs. 55% of the Goal-Object constructions), while 4.4% passive forms take the Theme-Object constructions and 95.6% take the Goal-Object constructions.

Since passive forms contribute significantly to the overall distribution of the two constructions, the interaction between VERB and PARTICIPLE becomes significant for *pogruzit'* ($p = 0.000373$) and *zagruzit'* ($p = 0.003034$). As a main effect, PARTICIPLE overestimates the probability of the Goal-Object construction because the two other verbs, *gruzit'* and *nagruzit'*, have only one case of the Theme-Object construction with passive forms each. The inclusion of the interaction between VERB and PARTICIPLE more accurately represents this effect in the model.

Thus the passive participles boost the frequency of the construction that is more frequent for non-passive forms. The only exception is the unprefixed verb *gruzit'*, where passive participles change the preference for the construction from the Theme-Object to the Goal-Object. This distribution is the result of general tendencies within the Russian grammatical system, where passive participles are usually formed exclusively from perfective verbs. In those cases where imperfective verbs are characterized by a high frequency of passive participles, they basically perform the function of adjectives: cf. *kopčenyj* 'smoked' as in *kopčenaja ryba* 'smoked fish', *solenyj* 'salted' (*solenye ogurcy* 'pickles', literally 'salted cucumbers'), *žarenyj* 'fried'

(*žarenoe mjaso* 'fried meat'). Passive forms of the verb *gruzit'* constitute only ¼ of the data and in the majority of cases characterize the state of the Goal, as in example 12):

12) *My vozvraščalis'. Navstreču dvigalis' tjaželo gružennye <u>mašiny</u>.*
[We were-going-back. Towards were-moving heavily loaded <u>cars</u>-NOM]
'We were going back. Heavily loaded <u>cars</u> were moving towards us'

In example (12), the participle basically loses its connection with the loading event and mainly refers to the state of the cars, i.e. being heavy.

Thus, verbs appear to be sensitive to grammatical forms. Furthermore, as we illustrate in the following section, constructions are sensitive to reduction.

4.4. Reduced constructions
"Reduced constructions" overtly express the participant profiled as the direct object, while omitting the other participant. The tables below provide the frequencies for the reduced structures with non-passive (Table 5) and passive forms (Table 6) of the verb *gruzit'* 'load' and its Natural Perfectives. The same data is made more explicit in Figures 3 and 4.

	Full constructions					Reduced constructions				
All non-passive forms	Theme-Object construction		Goal-Object construction			Theme-Object construction		Goal-Object construction		
	raw fr.	relative fr.	raw fr.	relative fr.	total	raw fr.	relative fr.	raw fr.	relative fr.	total
gruzit'	137	81%	32	19%	169	71	61%	46	39%	117
nagruzit'	27	28%	70	72%	97	7	14%	43	86%	50
zagruzit'	64	51%	62	49%	126	30	37%	52	63%	82
pogruzit' [6]	207	100%	0	0%	207	46	98%	1	2%	47

Table 5. The distribution of reduced structures with non-passive forms of the verb *gruzit'* 'load' and its Natural Perfectives.

	Full constructions					Reduced constructions				
Passive forms	Theme-Object construction		Goal-Object construction			Theme-Object construction		Goal-Object construction		
	raw fr.	relative fr.	raw fr.	relative fr.	total	raw fr.	relative fr.	raw fr.	relative fr.	total
gružen	1	1%	90	99%	91	0	0%	16	100%	16
nagružen	1	0.7%	134	99.3%	135	0	0%	86	100%	86
zagružen	6	6%	95	94%	101	5	3.4%	142	96.6%	147
pogružen	427	100%	0	0%	427	20	91%	2	9%	22

Table 6. The distribution of reduced structures with passive forms of the verb *gruzit'* 'load' and its Natural Perfectives.

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[6] The diagram does not include the verb *pogruzit'* since it is almost never attested in the Goal-Object construction and the interaction between reduction and the construction does not seem to be relevant.
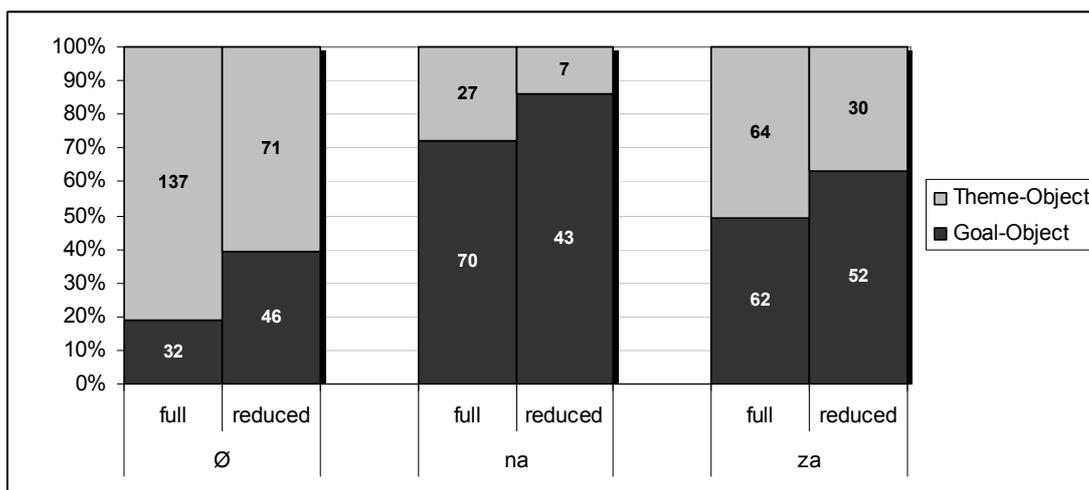
Figure 3. The distribution of reduced structures with non-passive forms of the verb *gruzit'* 'load' and its Natural Perfectives.
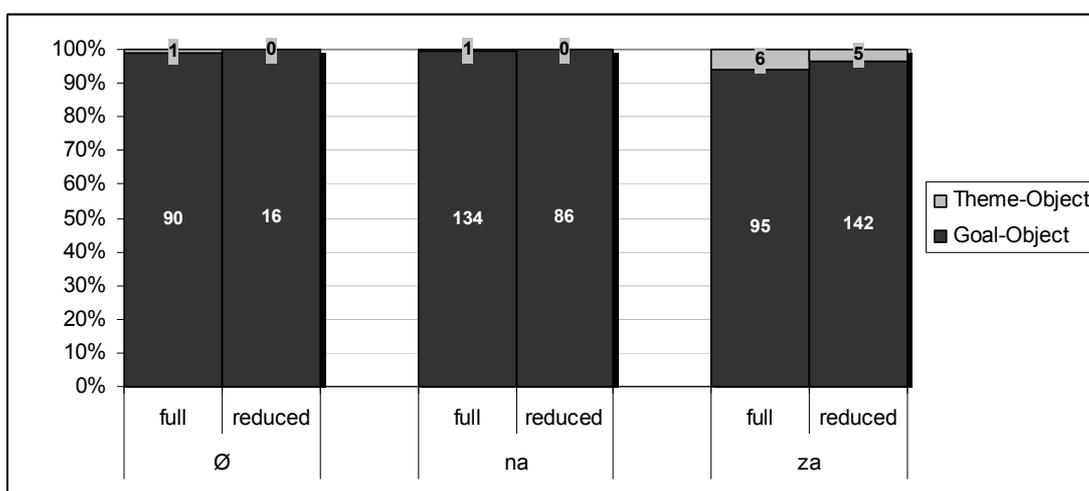

Figure 4. The distribution of reduced structures with passive forms of the verb *gruzit'* 'load' and its Natural Perfectives.

The REDUCED variable has a significant correlation with the choice of the construction ($\chi^2 = 26.8$, $p = 2.257e\text{-}07$). As can be seen from Figure 3, the Goal-Object construction shows a higher frequency with reduced constructions: about 20% higher for *gruzit'* and *nagruzit'* and 14% higher for *zagruzit'*. This proportion illustrates that the two constructions behave differently in terms of reduction. Furthermore, the only contexts where the verb *pogruzit'* is attested in the Goal-Object construction are reduced structures, as illustrated by example 13):

13) …*mašinu uže pogruzili… značit ona… s instrumentom/ da?*
[Car-ACC already they-loaded… so it-NOM … with tools-INS/ yes?]
'The car has already been loaded… So, the tools are already there, right?'

The car, represented as a direct object, is the Goal in the construction since the following context specifies that the car contains the tools, which are the Theme.

One more important difference between the Theme-Object and the Goal-Object constructions in terms of their relation to reduction is that the quality of reduced structures in the two constructions appears to be different. In examples 6 and

7, the missing component is mentioned in the previous context and thus can be treated as an instance of ellipsis. Such cases are attested for both the Theme-Object and the Goal-Object construction. Yet, the Goal-Object construction is also characterized by cases where reduction interacts with metaphor. The major metaphorical extensions involve a "person" (Goal), who serves as the metaphorical CONTAINER, and "information" or "work" (Theme), which represent metaphorical CONTENTS, as shown in examples (14-15) below:

14) *On čto-to vdrug zagruzilsja i rešil zagruzit' svoego predannogo slušatelja.*
[He-NOM somehow suddenly loaded-REFL and decided to-load his-ACC devoted-ACC listener-ACC]
'For some reason he suddenly got confused and decided to confuse his devoted listener.'

15) *Koroče, on nagruzil artistov tak, čto v itoge my snjali xorošee kino.*
[In-short, he-NOM loaded artists-ACC so, that in end we shot good-ACC film-ACC]
'In short, he stressed the artists so much that we ended up shooting a good film.'

In example 14), a human being (the listener) serves as the metaphorical CONTAINER for information that represents metaphorical CONTENTS. Analogously, in 15), the human beings (the artists) are loaded with work.[7]

The Theme-Object constructions can also involve both metaphor and reduction, but such structures are less frequent than the Goal-Object construction and the missing component is usually present in the previous context:

16) *Ja begom kinulsja domoj i, ne razdevajas', vključil kompjuter* (the Goal that is further omitted)*, zagruzil èlektronnuju kartu goroda.*
[I-NOM run-INST threw-self home and, not having-undressed, turned-on computer-ACC, loaded electronic map-ACC town-GEN.]
'I raced home and turned on my computer without even taking my coat off and downloaded the electronic map of the town.'

Example 16) involves the frame of computer use, where the computer is the CONTAINER, and electronic data are the metaphorical CONTENTS that are loaded into the computer.

In addition to the three correlations discussed above (between the construction and such factors as the verb, the grammatical form and reduction), our data also shows a correlation between the prefix and prepositions. This correlation can be attested only in the full version of the Theme-Object construction, for which reason we did not include it into our regression model. The next subsection examines the role of prepositions in more detail.

4.5 Prepositions
As discussed above, the non-passive forms of *nagruzit'* strongly prefer the Goal-Object construction, and there might be a connection here between the SURFACE meaning of the prefix *na-* and its etymological cousin, the preposition *na* 'onto'. The

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[7] Such contexts should be distinguished from cases of ellipsis since the omission of the second participant is almost conventionalized. In Fillmore's terminology, sentences like 14) and 15) can be treated as "definite null instantiations" of the Theme, when a participant is consistently omitted, is not mentioned in the preceding context but yet is known to the speaker and the hearer (Fillmore 2008).

focus on surfaces suggests a focus on locations (goals) as opposed to goods (themes) that are loaded on them. Because prepositions are used only in the Theme-Object construction, all data in this subsection pertains only to that construction.

	preposition *na* 'onto'	preposition *v* 'into'	no preposition
gruzit'	67	67	66
nagruzit'	19	2	3
zagruzit'	7	52	35
pogruzit'	54	143	55

Table 7: Prepositions used with non-passive forms of 'load' verbs to mark the goal in the Theme-Object construction.
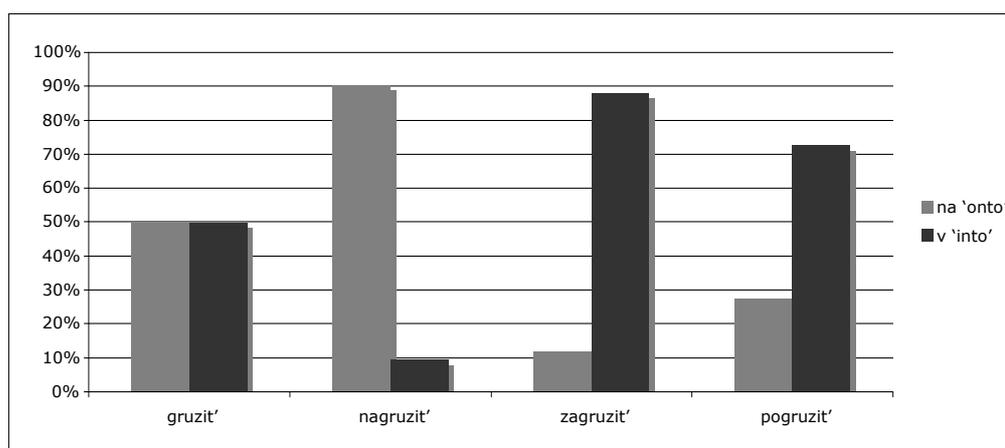

Figure 5: Prepositions used with non-passive forms of 'load' verbs to mark the goal in the Theme-Object construction

Table 7 shows the distribution of prepositions that occur in the Theme-Object construction. The right-most column in Table 7, marked "no preposition", aggregates a variety of types of data, since the path of the Theme can alternatively be marked by various adverbs or omitted altogether. Figure 5 presents the same data in terms of percentages (ignoring the uses without a preposition) graphically.

In order to probe for a significant relationship between prefixes and prepositions, the data in Table 7 was analyzed using χ^2-test, excluding the "no preposition" column, which is heterogeneous and thus not strictly comparable to the data in the other two columns. A χ^2-test comparing the distribution of frequencies yields a value of 59.8343 (df = 3, p = 6.377e-13), suggesting an association between the choice of the prefix and the choice of the preposition. To measure the effect size of the χ^2 values, Cramer's V was used, where 0.1 is a small size, 0.3 is a moderate size, and 0.5 is a large size (Cohen 1998: 215-271; King & Minium 2008: 327-330). In our case, the effect size measured by Cramer's V is 0.38, thus registering between a moderate and a large effect.

The imperfective base verb *gruzit'* 'load' has no preference with regard to the prepositions *na* 'onto' and *v* 'into'. *Nagruzit'* attracts the preposition *na* 'onto', while both *zagruzit'* and *pogruzit'* follow the opposite trend, attracting the preposition *v* 'into'. It appears that the choice of the preposition in the Theme-Object construction depends on whether the goal is understood as a SURFACE (*na* 'onto') or as a CONTAINER (*v* 'into'). The association of the *na-* prefixed verb with the preposition *na* makes sense, since the preposition and the prefix have inherited a meaning that refers

to a SURFACE, cf. the verb *nadet'* 'put on (clothing)' and the phrase *na stol* 'onto the table'. This connection is palpable also in examples like 17):

17) <u>*Na teležku*</u> *nagruzili* <u>*celuju goru*</u> *jaščikov, čemodanov i meškov.*
[<u>Onto cart-ACC</u> loaded <u>whole mountain-ACC</u> boxes, suitcases and bags-GEN.]
'[They] loaded <u>a whole mountain</u> of boxes, suitcases and bags <u>onto the cart</u>.'

Zagruzit' and *pogruzit'*, on the other hand, strongly prefer the preposition *v* 'into', where the goal is conceptualized as a CONTAINER, as in 18) and 19).[8]

18) *Krome togo,* <u>*v mašinu*</u> *zagruzili* <u>*ogromnyj rjukzak*</u> *s paraplanom,* <u>*paru*</u> *kanistr,* <u>*vešči,*</u> instrument *i* <u>*koe-kakuju meloč'*</u>.
[Beside that-GEN, <u>into car-ACC</u> loaded <u>huge backpack-ACC</u> with paraglider-INST, <u>pair-ACC</u> canister-GEN, <u>things-ACC</u>, <u>instrument-ACC</u> and <u>various trifles-ACC</u>.]
'In addition [they] loaded <u>a huge backpack</u> with a paraglider, <u>a couple</u> of canisters, <u>things</u>, <u>an instrument</u> and <u>various trifles</u> <u>into the car</u>.'

19) *Pogruziv s pomošč'ju šofera* <u>*v mašinu*</u> <u>*svoi vešči,*</u> *Tamara vsju dorogu do goroda prodremala.*
[Having-loaded with help-INST driver-GEN <u>into car-ACC</u> <u>own things-ACC</u>, Tamara-NOM whole way-ACC to town-GEN slept.]
'Having loaded <u>her things</u> <u>into the car</u> with the driver's help, Tamara slept all the way to town.'

5. Conclusions
The constructional profiles of the four Russian 'load' verbs, *gruzit'*, *nagruzit'*, *zagruzit'*, and *pogruzit'* are distinct: logistic regression shows that there is a highly significant correlation between the verb and the choice of the construction. This finding supports the theoretical hypothesis that the meanings of words and constructions interact, as suggested by the constructional approach to the Locative Alternation. The syntactic/lexical-semantic approach cannot account for the observed variation among verbs, since it can only recognize verbs as having the alternation or lacking it. The frame approach would constrain us to treating each of the 'load' verbs as a pair of homonyms, and again we would lose sight of the differences in variation.

The unprefixed imperfective *gruzit'* favors the Theme-Object construction. The addition of a prefix radically changes this distribution, each in a different way: *nagruzit'* strongly favors the Goal-Object construction, *zagruzit'* creates a near-balance between the two constructions, whereas *pogruzit'* uses the Theme-Object construction in a nearly exclusive manner. This finding contradicts the traditional assumption that the prefixes *na-*, *za-*, and *po-* function as semantic zeroes in forming perfective partner verbs from *gruzit'*. If the prefixes were zeroes, they should have no effect, or at least they should all have the same effect (since they all perfectivize the verb).

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[8] In the case of *zagruzit'*, this preference may be due to a parallelism between the preposition *v* 'into' and the preposition *za* 'beyond', both of which can refer to crossing the boundary of a container. In the case of *pogruzit'*, the preference for *v* 'into' may be explained by the presence of some examples that continue the original meaning of this verb as 'sink, plunge', from which the 'load' meaning is historically derived via metonymy (since barges sink when loaded, cf. Nichols 2008). These are, however, speculative remarks that will need further study.

The observation of three distinct effects indicates that the prefixes are not devoid of meaning. There is, however, a way to reconcile this finding with the traditional understanding of "purely aspectual" prefixes if we recognize the effect of the prefixes as semantic overlap rather than merely addition. Because the meanings of the prefixes and the verb overlap, there is an illusion of emptiness (cf. Janda & Nesset forthcoming). Our data show that even these overlaps result in dramatic differences in the constructional profiles of the resulting perfectives.

Furthermore, there appears to be an interaction between the two Locative Alternation constructions and the passive construction. The past passive participles largely suppress the Locative Alternation, using the Goal-Object construction, except in the case of *pogruzit'*, where the nearly exclusive preference for the Theme-Object construction remains. A possible explanation of this distribution is that passive participles boost the frequency of the main construction associated with the verb (Goal-Object for *nagruzit'* and *zagruzit'*, and Theme-Object for *pogruzit'*), perhaps due to the focus of attention on the patient. The unprefixed verb *gruzit'*, where passive participles change the preference from the Theme-Object to the Goal-Object construction, appears to be an exception caused by the general tendencies within the Russian grammatical system. In Russian, passive participles are formed primarily from perfective verbs. When formed from imperfective verbs, participles usually perform the function of adjectives, which in the case of *gruzit'* characterize the state of the Goal. This finding requires further investigation on a larger number of verbs.

Both Theme-Object and Goal-Object constructions can be represented via reduced versions, where the former omits the Goal and the latter omits the Theme. Our model also shows that there is a correlation between the construction and its full or reduced version: reduced frames favor the Goal-Object construction, while full frames are used mainly in the Theme-Object construction. The interaction between the Goal-Object construction and reduction is supported by two observations: on the one hand, the Goal-Object construction shows a higher frequency with reduced constructions for the verbs *gruzit'*, *nagruzit'* and *zagruzit'*; on the other hand, reduced structures are the only contexts where the verb *pogruzit'* is attested in the Goal-Object construction. One more important difference between the Theme-Object and the Goal-Object constructions in terms of their relation to reduction is that the quality of reduced structures in the two constructions appears to be different: in the case of the Theme-Object construction, we mostly deal with ellipsis, where the missing component is mentioned in the previous context, while the Goal-Object construction is also characterized by conventionalized reduced contexts, where reduction interacts with metaphor. The major metaphorical extensions here involve a "person" (Goal), who serves as the metaphorical CONTAINER, and "information" or "duties" (Theme), which represent metaphorical CONTENTS. This topic merits further research.

Within the Theme-Object construction, we find an interesting distribution of prepositions. Whereas the unprefixed imperfective *gruzit'* shows a three-way split among use of the preposition *na* 'onto', *v* 'into' and no preposition, the prefixed perfectives have strong preferences. The prefix *na-* in *nagruzit'* prefers its etymological cousin *na* 'onto', but both *za-* and *po-* prefer *v* 'into'. It may be that *nagruzit'* is primarily used with goals that are understood as surfaces, whereas *zagruzit'* and *pogruzit'* tend to select for goals that are understood as containers. However, there is considerable variation here and this topic can also be taken up in future work.

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